

Loughborough University Institutional Repository

Understanding organisational improvisation: foundations and performance implications

This item was submitted to Loughborough University's Institutional Repository by the/an author.

Additional Information:

- A Doctoral Thesis. Submitted in partial fulfillment of the requirements for the award of Doctor of Philosophy of Loughborough University.

Metadata Record: <https://dspace.lboro.ac.uk/2134/8115>

Publisher: © Darwina Arshad

Please cite the published version.

This item was submitted to Loughborough's Institutional Repository (<https://dspace.lboro.ac.uk/>) by the author and is made available under the following Creative Commons Licence conditions.



CC creative commons
COMMONS DEED

Attribution-NonCommercial-NoDerivs 2.5

You are free:

- to copy, distribute, display, and perform the work

Under the following conditions:

BY: **Attribution.** You must attribute the work in the manner specified by the author or licensor.

Noncommercial. You may not use this work for commercial purposes.

No Derivative Works. You may not alter, transform, or build upon this work.

- For any reuse or distribution, you must make clear to others the license terms of this work.
- Any of these conditions can be waived if you get permission from the copyright holder.

Your fair use and other rights are in no way affected by the above.

This is a human-readable summary of the [Legal Code \(the full license\)](#).

[Disclaimer](#) 

For the full text of this licence, please go to:
<http://creativecommons.org/licenses/by-nc-nd/2.5/>

Understanding
Organisational Improvisation:
Foundations and Performance Implications

By

Darwina Arshad

A Doctoral Thesis
Submitted in partial fulfilment of the
requirement for the award of

The Degree Doctor Philosophy of the
Loughborough University

2011

Acknowledgements

I would like to express heartfelt appreciation to number of people that have supported and make this research possible. Firstly, a million thanks to my academic supervisor, Dr. Paul Hughes; his constructive comments, direction, expertise, sanguinity and incredible kindness has increased my efficacy to accomplish my thesis.

I am also indebted to my co-supervisor, Dr. Ian Hodgkisson and Professor Trevor Buck and my Director of Research, Dr. Ursula Ott for their advice and support throughout my research journey. This cordial thanks is also dedicated to all my friends, research colleagues and also to the staff of the Loughborough Business School and Universiti Utara Malaysia.

To my beloved family, my wonderful dad, Hj Ahmad Arshad, and my beautiful mum, Wan Kiah Wan Taib, a deepest thanks to all the blessings and prays which have given me strength for achievement and success. This special heartfelt thanks also goes to my younger brother, Dirwan, and sisters Diyana and Dahlia who always help and supports me.

Lastly, my deepest appreciation goes to my *special* research colleague cum my soul mate, Hendrik Lamsali, my charming little prince, Hadi Ilhan and my cute little princess, Dhia Elly Zulaikha, without their love, encouragement, support and patience, I would not be able to complete my journey.

Abstract

This research is grounded in strategy process theory and contingency theory and the main research aims are to investigate the antecedent factors affecting organisational improvisation and to identify how improvisation determines firm performance. This study is the first to examine the antecedent factors, which are categorised onto managerial and organisational factors that drive improvisation. The managerial factors contain the reasoning ability of managers (intuitive and rational) and managers' characteristics (self-confidence, manager's expertise and attitude towards risk-taking). Whilst the organisational factors include organisational structure and characteristics (goal clarity, organisational structure, organisational flexibility and organisational risk-taking), and information processing (organisational information and organisational memory). Environmental turbulence (technology, market and competitive) is examined as an external moderating factor to the improvisation–performance relationship.

Fifteen hypotheses were developed and examined in this study. A cross sectional survey methodology was used to test the hypotheses of this study. A postal questionnaire primary data was collected from 128 top management executives of high technology-based companies in Malaysia.

In summary, the findings confirm that a total accumulated variance in organisational improvisation was collectively explained by managerial factors and organisational factors; thus confirming that those aforementioned factors have statistically significant associations with organisational improvisation. Based on the study of the improvisation–performance relationship, the results revealed a positive significant relationship between both factors. Surprisingly, once the environmental turbulence factors were introduced as a moderator, the result on the association between improvisation and firm performance was greater than before; thus demonstrating a significant moderating effect on the relationships between organisational improvisation and firm performance. However, mixed results were identified when the association between each antecedent and improvisation was tested and the effect of each moderating factor was individually examined.

This study on the effect of internal and external factors on organisational improvisation and firm performance makes novel contributions to the existing body of knowledge as well as to practitioners. It is noticeable that organisational improvisation in strategic management is crucial as a decision-making mechanism for improving organisational performance. Hence, managers themselves as well as other relevant factors within firm hierarchy should facilitate and induce necessary condition that may drive organisational improvisation to happen.

1.0 INTRODUCTION 1

1.1. Introduction.....	1
1.2. Background of Research.....	1
1.3. Research Objectives and Research Questions	11
1.4. Significance of the Study	11
1.5. Chapter Feature and Organisation	13

2.0 LITERATURE REVIEW..... 16

2.1. Introduction.....	16
2.2. Organisational Improvisation	16
2.3. Measuring Improvisation.....	20
2.4. The Concept of Improvisation.....	22
2.5. Improvisation: Previous Knowledge Gaps.....	23
2.6. Improvisation from the Strategic Management Perspective.....	27
2.7. Theoretical Underpinnings	33
2.7.1. <i>Strategy as Process</i>	35
2.7.1.1. Information Processing and the Strategy Process	39
2.7.1.2. Organisational Structure and the Strategy Process	41
2.7.1.3. Managerial Characteristics and the Strategy Process	44
2.7.2. <i>Contingency Theory</i>	48
2.8. Identification of Research Gap	52
2.8.1. <i>Antecedent factors that affect Improvisation</i>	52
2.8.2. <i>Organisational Improvisation and Firm Performance</i>	61
2.9. Concluding Remarks	65

3.0 RESEARCH HYPOTHESES 66

3.1. Introduction.....	66
3.2. Research Model.....	66
3.3. Development of Research Hypotheses	69

Detailed Contents *Page*

3.3.1. <i>Managerial Factors</i>	69
3.3.1.1. Reasoning Factors.....	70
3.3.1.2. Manager's Self-Confidence	75
3.3.1.3. Manager's Expertise.....	76
3.3.1.4. Manager's Attitude towards Risk.....	78
3.3.2. <i>Organisational Factors</i>	80
<i>Organisational Structure and Characteristics</i>	81
3.3.2.1. Clarity of Goal.....	82
3.3.2.2. Organisational Structure	84
3.3.2.3. Organisational Flexibility	86
3.3.2.4. Organisational Risk Taking	88
<i>Information Processing</i>	90
3.3.2.5. Organisational Information	91
3.3.2.6. Organisational Memory	93
3.3.3. <i>Organisational Improvisation and Performance</i>	95
3.3.3.1. External Environmental Turbulence as Moderating Variables between Improvisation and Firm Performance	98
3.4. Concluding Remarks	104

4.0 RESEARCH DESIGN AND EMPIRICAL METHOD 106

4.1. Introduction.....	106
4.2. Research Philosophy	107
4.3. Research Strategies.....	110
4.3.1. <i>Exploratory Research Design</i>	112
4.3.2. <i>Descriptive Research Design</i>	113
4.3.3. <i>Experimental Research Design</i>	115
4.3.4. <i>Choice of Research Strategy</i>	116
4.4. Research Methodology	117
4.4.1. <i>The Sampling Process</i>	117
4.4.2. <i>Data Generation</i>	129
4.4.3. <i>Data Collection</i>	131
4.4.4. <i>Instrumentation</i>	137
4.4.5. <i>Response Measurement</i>	149
4.4.6. <i>Survey Design</i>	150
4.4.6.1. A Cover Letter.....	151
4.4.6.2. An Endorsement Letter	152
4.4.6.3. A Pre-stamped Returned Envelope	152

<i>Detailed Contents</i>	<i>Page</i>
4.4.6.4. Reminder Letter.....	153
4.4.6.5. Questionnaire Content.....	153
4.4.7. Questionnaire Validation Process.....	154
4.4.7.1. Pre-Testing.....	154
4.4.7.2. Pilot Testing.....	156
4.4.8. ActualData Collection Process.....	157
4.4.9. Data Analysis.....	158
4.4.9.1. Descriptive Analysis	159
4.4.9.2. Checking for Non-response Bias.....	159
4.4.9.3. Checking for Common Method Bias	160
4.4.9.4. Validity and Reliability Analysis	162
4.4.9.5. Correlation Analysis	164
4.4.9.6. Regression Analysis	164
4.5. Concluding Remarks	166

5.0 DESCRIPTIVE STATISTICS OF THE SAMPLE 167

5.1. Introduction.....	167
5.2. Profile of the Responding Companies.....	167
5.2.1. Respondents' Response	168
5.2.2. Type of Industry.....	169
5.2.3. Company's Years of Operation	171
5.2.4. Company Size.....	171
5.2.5. Number of Years Company Competing in the Industry.....	174
5.3. Profile of the Respondents	175
5.3.1. Respondents' Position	175
5.3.2. Involvement of the Respondents	176
5.3.3. Respondents' Age.....	178
5.3.4. Respondents' Position and Age.....	179
5.3.5. Respondents' Level of Education	179
5.3.6. Respondents' Gender.....	180
5.3.7. Years of Respondents Working in the Current Company	181
5.3.8. Years of Respondents' Experience in the Particular Industry.....	181
5.3.9. Years of Respondents' Position and Experience in the Particular Industry.....	182
5.4. Test for Non-Response Bias	183
5.5. Examination of Common Method Bias	188

<i>Detailed Contents</i>	<i>Page</i>
---------------------------------	--------------------

5.6.	Examination of Data	188
5.6.1.	<i>Examining the Missing Value</i>	189
5.6.2.	<i>Examining Normality</i>	189
5.7.	Concluding Remarks	190

6.0 VALIDITY AND RELIABILITY ANALYSIS..... 191

6.1.	Introduction.....	191
6.2.	Investigating Validity through Factor Analysis	191
6.2.1.	<i>Principal Component Analysis of Organisational Improvisation and Managerial Factors</i>	199
6.2.2.	<i>Principal Component Analysis of Organisational Factors</i>	202
6.2.3.	<i>Principal Component Analysis of Firm Performance and Environmental Turbulence</i>	205
6.3.	Investigating Scale Reliability through Cronbach Alpha.....	206
6.4.	Construction of Summated Scale	208
6.5.	Investigating Scale Validity through Item-Total Scale Correlation	209
6.6.	Concluding Remarks	212

7.0 HYPOTHESES TESTING 213

7.1.	Introduction.....	213
7.2.	Data Screening through Descriptive and Correlation Analysis	213
7.3.	Hypotheses Testing through Multiple Regression.....	216
7.3.1.	<i>Hypothesis Testing on the Relationship between Managerial Factors and Organisational Improvisation</i>	221
7.3.1.1.	Hypothesis Testing on the Relationship between Managerial Factors and Organisational Improvisation....	222
7.3.1.2.	Hypothesis Testing on the Relationship between Organisational Factors and Organisational Improvisation	224
7.3.2.	<i>Hypothesis Testing on the Relationship between Environmental Turbulence, Organisational Improvisation and Firm Performance</i>	226
7.4.	Concluding Remarks	230

8.0 DISCUSSION	232
8.1. Introduction.....	232
8.1.1. Reasoning Factors	232
8.1.2. Individual Managerial Factors	238
8.1.3. Organisational Factors.....	241
8.1.4. Organisational Improvisation-Performance Relationship.....	251
8.1.5. External Factors as Moderating Variables.....	252
8.2. Concluding Remarks	256
9.0 CONCLUSIONS	258
9.1. Introduction.....	258
9.2. Thesis Summary	258
9.2.1. Research Objectives and Research Questions	258
9.2.2. Significance of the Study.....	259
9.2.3. Summary of the Conceptualisation	261
9.2.4. Summary of Research Design and Research Method	262
9.2.5. Summary of Data Analysis Method	263
9.2.6. Summary of Hypotheses Results.....	265
9.3. Reflections on the Whole Research Process.....	266
9.4. Implication of Study Findings: Theoretical and Managerial Issues	271
9.4.1. Managerial Factors	273
9.4.2. Organisational Factors.....	276
9.4.3. Improvisation-Performance Relationship and Environmental turbulence as moderating factor	280
9.5. Limitations and Directions for Future Research.....	284
9.6. Concluding Remarks	290
<i>References</i>	292
<i>Appendices</i>	327

TABLE 2-1: DEFINITIONS OF ORGANISATIONAL IMPROVISATION	17
TABLE 2-2: STRATEGY PROCESS PERSPECTIVES IN EXTANT LITERATURE.....	37
TABLE 2-3: ANTECEDENT FACTORS OF ORGANISATIONAL IMPROVISATION.....	60
TABLE 3-1:SUMMARY OF CORE PREVIOUS LITERATURES INSPIRING THE HYPOTHESES STUDY	104
TABLE 3-2: SUMMARY OF HYPOTHESIS TESTING.....	105
TABLE 4-1: RESEARCH PARADIGM	108
TABLE 4-2: ALTERNATIVE STRATEGIES OF INQUIRY	111
TABLE 4-3: A SAMPLE OF PREVIOUS STUDIES ON ORGANISATIONAL IMPROVISATION.....	121
TABLE 4-4: CRITERIA OF HIGH TECHNOLOGY PRODUCTS AND SERVICES FROM THREE DIFFERENT APPROACHES	124
TABLE 4-5: SAMPLING FRAME OF FOUR DIRECTORIES AND SELECTION OF PRODUCTS/SERVICES.....	128
TABLE 4-6: NUMBER OF SAMPLE OF EACH DIRECTORY	129
TABLE 4-7: ASSESMENT OF SURVEY METHODOLOGIES.....	133
TABLE 4-8: VARIABLES, ITEM MEASURES AND SOURCES OF ITEMS.....	141
TABLE 5-1: RATE OF RESPONSES FROM EACH SOURCE	168
TABLE 5-2: THE PERCENTAGE OF USABLE RESPONDENTS.....	169
TABLE 5-3: TYPE OF INDUSTRY.....	170
TABLE 5-4: YEARS OF COMPANY OPERATING IN THE BUSINESS	171
TABLE 5-5: NUMBER OF EMPLOYEES.....	172
TABLE 5-6: COMPANY’S ANNUAL SALES TURNOVER.....	173
TABLE 5-7: YEARS OF COMPANY COMPETING IN HIGH TECHNOLOGY-BASED INDUSTRY	174

<i>List of Tables</i>	<i>Page</i>
TABLE 5-8: RESPONDENTS ' CURRENT POSITION	175
TABLE 5-9: YEARS OF RESPONDENTS' CURRENT POSITION IN THE COMPANY.....	176
TABLE 5-10: RESPONDENTS' KNOWLEDGE LEVEL.....	177
TABLE 5-11: THE DIFFERENCE BETWEEN GROUPS AND LEVEL OF RESPONDENTS' KNOWLEDGE	178
TABLE 5-12: RESPONDENT'S AGE	178
TABLE 5-13: RESPONDENTS' POSITION AND AGE.....	179
TABLE 5-14: LEVEL OF EDUCATION OF RESPONDENTS.....	180
TABLE 5-15: RESPONDENTS' JOB POSITION AND LEVEL OF EDUCATION	180
TABLE 5-16: GENDER OF RESPONDENTS.....	181
TABLE 5-17: YEARS OF RESPONDENTS WORKING IN THE CURRENT COMPANY.....	181
TABLE 5-18: YEARS OF RESPONDENT'S EXPERIENCE IN TECHNOLOGY- BASED INDUSTRY	182
TABLE 5-19: YEARS OF RESPONDENTS' POSITION AND EXPERIENCE IN TECHNOLOGY-BASED INDUSTRY.....	183
TABLE 5-20: A TEST FOR NON-RESPONSE BIAS ON ORGANISATIONAL IMPROVISATION.....	184
TABLE 5-21: TEST FOR NON-RESPONSE BIAS ON REASONING FACTORS	184
TABLE 5-22: TEST FOR NON-RESPONSE BIAS ON INDIVIDUAL MANAGERIAL FACTORS.....	185
TABLE 5-23: TEST FOR NON-RESPONSE BIAS ON ORGANISATIONAL FACTORS	186
TABLE 5-24: TEST FOR NON-RESPONSE BIAS ON ENVIRONMENTAL TURBULENCE.....	187
TABLE 5-25: TEST FOR NON-RESPONSE BIAS ON FIRM PERFORMANCE	187

<i>List of Tables</i>	<i>Page</i>
TABLE 6-1: INVESTIGATING VALIDITY: RESULT OF KMO MEASURE OF SAMPLING ADEQUACY AND BARTLETT'S TEST OF SPHERICITY	194
TABLE 6-2: PRINCIPAL COMPONENT ANALYSIS OF ORGANISATIONAL IMPROVISATION AND MANAGERIAL FACTORS	200
TABLE 6-3: PRINCIPAL COMPONENT ANALYSIS OF ORGANISATIONAL FACTOR	203
TABLE 6-4: PRINCIPAL COMPONENT ANALYSIS OF FIRM PERFORMANCE AND ENVIRONMENTAL TURBULENCE ..	205
TABLE 6-5: THE RELIABILITY TEST THROUGH CRONBACH ALPHA	208
TABLE 6-6: THE ITEM-TOTAL SCALE CORRELATION STATISTICS.....	210
TABLE 7-1: CORRELATION ANALYSIS.....	215
TABLE 7-2: REGRESSION ANALYSIS FOR HYPOTHESIS 1 THROUGH TO 11.....	221
TABLE 7-3: REGRESSION ANALYSIS FOR HYPOTHESIS 12 THROUGH TO 15.....	227
TABLE 7-4: SUMMARY OF HYPOTHESES TESTING RESULT	229

FIGURE 2-1: RELATIONSHIP BETWEEN STRATEGIC MANAGEMENT
PROCESS, MINTZBERG'S TYPOLOGY OF STRATEGIES AND
IMPROVISATION32

FIGURE 2-2:IMPROVISATION AND STRATEGY AS PROCESS THEORY48

FIGURE 2-3:IMPROVISATION AND CONTINGENCY THEORY51

FIGURE 3-1: CONCEPTUAL MODEL ON THE RELATIONSHIP BETWEEN
INTERNAL AND EXTERNAL FACTORS, ORGANISATIONAL
IMPROVISATION AND FIRM PERFORMANCE68

FIGURE 7-1: THE SUMMARY OF OVERALL RESEARCH FINDINGS231

Chapter 1

Introduction

1.1. Introduction

First of all, the chapter covers the basic theoretical and empirical research gaps which demonstrate in the background of this research. Then it follows with research objectives, research questions and the significance of this study. Lastly, this chapter describes the organisation of each chapter.

1.2. Background of Research

Traditionally in strategic management research, organisational decisions and actions are the product of strategic planning. Strategic planning can be defined as *“a disciplined effort to produce fundamental decisions and actions that shape and guide what an organisation is, what it does, and why it does it”* (Olsen and Eadie, 1982:4) with a focus on the future. Strategic planning involves anticipating the future environment, however the decisions are made in the present (Steiner, 1979). For example, in June 2010, Air Asia, Malaysia’s budget airline company, planned to achieve their revenue target of 12 billion Baht along with the stipulated passenger target of 6.2 million from travel to and around Thailand during 2011 (Weston, 2010). However, when severe flood hit the southern part of Thailand in November 2010, most airports were closed and consequently, flights were cancelled. The disaster thus indirectly affected the target revenue that has been previously decided. This scenario depicts that whilst the company has a formal strategic planning process, it is not necessarily best to make the most vital decisions (Quarterly, 2006) in achieving performance targets in turbulent environments.

Furthermore incompatibility between timing and structure of strategic planning as well as the mismatch between the way planning works and the way decision-making happens (Mankins and Steele, 2006) could lead to the under-utilisation of strategic planning. For example, 66% of executives who responded to the survey indicated that strategic planning in their respective companies is conducted via 'business by business' which means it had focused on units or group of units but 70% executives also responded that they make decisions based on an 'issue by issue' basis (Mankins and Steele, 2006). In this case, failure to incorporate planning and decision-making could hinder the firm's performance.

Strategic management research has often found conflicting results on the relationship between strategic planning and performance especially in turbulent environments (*e.g.* Fredrickson, 1984; Atuahene-Gima and Li, 2004; Atuahene-Gima and Murray, 2004). It is suggested that the rigid adherence to strategic planning creates a paradox between the need to move creatively, quickly and be flexible to adapt to changing conditions and the need to thoroughly develop the most appropriate plan (Slotegraaf and Dickson, 2004). Therefore, firms must take decisions out of the traditional planning process and create a different, parallel process for developing strategy that helps executives identify key decisions that are needed to create more shareholder value (Mankins and Steele, 2006). For instance, making decisions continuously without regards to the calendar (Mankins and Steele, 2006) could be essential in business today.

The organisation must stay abreast of changes in order to make the best decisions at any given point where the process of putting plan into action is compulsory. This means that strategic planning is useful only if it is simultaneously linked to strategic execution. As suggested by Moorman and

Miner (1998b) the convergence between planning and execution or in other words, *organisational improvisation* can be one of the best ways to reconcile organisational tensions.

Previous scholars have described improvisation and strategic planning either in opposites of a continuum or they complement each other. For instance, in conventional understanding, strategic plan is a step by step process from strategic formation to strategic evaluation; in contrast, Weick (2001) explains "*improvisation is just-in-time strategy which requires anticipating everything that will happen and more investment in general knowledge, a large skill repertoire, the ability to do a quick study, trust in intuitions, and sophistication in cutting losses*" (2001: 352). Meanwhile some scholars (*see* Moorman and Miner, 1998b; Feldman & Pentland, 2003; Pentland and Feldman, 2005 & 2008) suggested that planning and improvisation are complements which possibly engage in high levels of both design and action. This means that improvisation can be an essential tool to support strategic planning. However, studies on improvisation as a substitute to planning are still scarce and empirical evidence on the benefits of an organisational improvisation approach; specifically in strategic management is still vague, thus testifying to the significance of the study on organisational improvisation.

Organisational improvisation is a vital approach in today's business management because it can contribute to a meaningful decision, within a limited timescale, without the best information and resources available (Leybourne, 2006). It is "*a mixture of the pre-composed and the spontaneous, just as organisational action mixes together some proportion of control with innovation, exploitation with exploration, routine with non-routine, automatic with controlled*"(Weick, 1998:551). It differs from strategic flexibility. Strategy flexibility is "*the ability to shift from one dominant strategy to another*" (Wheelen

and Hungher, 2010: 61). It “*represents the organisational ability to manage economic and political risks by promptly responding in a proactive or reactive manner to market threats and opportunities*” (Grewal and Tansuhaj, 2001: 72); and therefore make it possible to effective improvisation (Cunha *et al.*, 1999, Crossan *et al.*, 2005). Whereas, improvisation enables managers to formulate strategy while acting spontaneously and creatively when faced with real time situations (Moorman and Miner, 1998b). The application of an improvisational approach could offer unique advantages to organisations such as enhancing firm outcomes (Leybourne and Sadler-Smith, 2006) and creating shareholder value (Mankins and Steele, 2006).

Extant literatures on improvisation are mainly based on jazz music and theatre metaphors (Bastien and Hostager, 1988; Weick, 1993; Kamoche and Cunha, 1997, 1998; Barret, 1998; Pasmore, 1998; Weick, 1998). Improvisation is often described as ‘intuition guiding action in a spontaneous way’ (Crossan and Sorrenti, 1997; Moorman and Miner, 1998b) and it is an alternative to rigid thinking as it reflects the notion that something (action) is done or produced on the spur of the moment (Webber *et al.*, 1999). It involves a high degree of spontaneity and high level of intuition and literature identifies intuitive insight, technical ability, group dynamics, motivation, awareness and understanding as enhancing factors for improvisation (Crossan and Sorrenti, 1997). According to Crossan and Sorrenti (2002), there are degrees of intuition and spontaneity of action from low to high. They state that spontaneous responses could appear from actions comparatively routine in nature, with relatively little or no intuition applied; to the level of fairly intuitive responses with no set standard, policy and procedure to rely on. Vera and Crossan (2005), on the other hand highlight that improvisation is a conscious choice people make rather than a random behaviour. The decision to improvise may be made on the spot or may be an option considered in

advance, as when firms have formal or informal norms enabling people to depart from routines at certain times to come up with something new (Vera and Crossan, 2005). However, how true these assertions are remains ambiguous due to lack of empirical study on organisational improvisation.

Many researchers have described improvisation by individuals such as improvisation by fire fighters, actors, athletes, musicians or teachers (Moorman and Miner, 1998b). But prior research had extensively focused on group level improvisation where most of the studies are based on project team improvisation (*e.g.* studies by Moorman and Miner, 1998b; Akgun and Lynn, 2002; Vera and Crossan, 2005); and unfortunately, they fail to explain not only how individual top level managers deal with improvisation but also fail to examine the act of *organisational* improvisation activities; particularly from the strategic management perspective.

From a strategic management perspective, it is believed that managers and organisational factors will have significant bearing on the likelihood that organisational improvisation occurs, or, formal planning processes are adhered to (*see* Chapter 2). Existing theoretical research suggests that the cognitive ability of the managers (Crossan and Sorrenti, 1997; Leybourne and Sadler-Smith, 2006), managerial characteristics such as skills and expertise (Moorman and Miner, 1998b; Cunha *et al.*, 1999), high self-confidence (Leybourne and Sadler-Smith, 2006) and risk taker type (Chelminski, 2007) could be the managerial factors that have direct effects on improvisational activity. Skilled and experienced managers with highly intuitive reasoning, for example, could not make impressive decisions on improvisation if she/he is not a risk-taker or lacks self-efficacy.

In this case, the unit analysis of this study focuses duly on top managers. Top managers represent as 'planners' and doers' (Mintzberg, 1994) in organisations. It is essential to choose top managers of the firm because most decisions and actions made by them not only represent themselves but can also be construed as highly affecting the whole organisation (Mintzberg, 1994). The organisation itself, per se, does not 'improvise'. The organisation is deemed to improvise through the actions of its individuals such that if there is a climate within the firm that enables individuals to improvise then over time this will enable organisational improvisation. Therefore, it is important to examine the internal conditions (organisationally) that allows for improvisation to occur but also understand the individual characteristics of managers that enable improvisation to occur. In so doing, there may be important implications that arise for human resource policy in terms of recruitment and selection of appropriate managers and personnel.

Besides this, scholars have emphasised the need for further research on how organisational structure and characteristics, and organisational information processing influence improvisation (Moorman and Miner, 1998b; Cunha *et al.*, 1999; Akgun and Lyn, 2002; Kamoche and Cunha, 2003; Vera and Crossan, 2005; Leybourne and Sadler-Smith, 2006; Chelminski, 2007; Souchon and Hughes, 2007). From strategic management theory, strategy formation and implementation is reliant on information and the approach to it is often dictated by structure. From the researcher's best knowledge, no study has yet examined improvisation at the organisational level underpinned by strategy process theory where structure (Corey and Star, 1971; Mintzberg, 1978; Piercy, 199; Lynch, 2003) and information (Hutt *et al.*, 1988; Chakravarthy and Doz, 1992) are the essential factors to be counted. Disparate studies in prior research, a lack of empirical studies on these elements and dubious/mixed empirical results on some relationships have given rise to the opportunity for

the researcher to close this gap in knowledge and demonstrate the likely significant contribution of this research to theories and practitioners, specifically from a strategic management view. For example, improvisation research has theoretically justified potential relationships with organisational structure (*e.g.* Weick, 1998; Barret, 1999; Cunha *et al.*, 1999; Kamoche *et al.*, 2003 and Cunha and Cunha, 2006b); flexibility (Scribner, 1984; Akgun, *et al.*, 2007); and risk taking attitude (Chelminski, 2007). Previous scholars conceptually propose that centralised structure tend to emphasis more formal method approach which prone to strategic planning (Bourgeois, 1985; Gibbons, 2005); whilst the organisation with decentralised structure tends towards organisational improvisation (Weick, 1998; Barret, 1999; Cunha *et al.*, 1999; Kamoche *et al.*, 2003; Cunha and Cunha 2006a and 2006b). For organisational flexibility and risk taking, flexible organisation tends to practice organisational improvisation (Akgun *et al.* 2007) and organisational risk is speculated by prior scholars to have a significant affect to organisational improvisation (Cunha and Cunha, 2003 and Chelminski, 2007). But unfortunately, no empirical evidence has yet proved these significant associations in the real world. Due to organisational goals, only one empirical examination on organisational goals has evidently been tested towards the effect on improvisation (Akgun and Lynn, 2002); and memory and information flows from previous studies have shown conflicting results (Moorman and Miner, 1998b; Vera and Crossan, 2005; Souchon and Hughes, 2007).

Furthermore, all present studies of improvisation have been conducted in western contexts, usually in the United States. Generalisation from these research however do not necessarily translate directly to eastern countries that are culturally different as well as managed in different ways, As such, this research also helps to bridge this knowledge gap in examining

improvisation in the eastern context. So whilst some elements of the model may have been demonstrated in past research into US firms it does not necessarily stand that such findings will also be true elsewhere in the world.

Identifying the foundations of improvisation is vital for organisations as it serves to provide faster decision-making, especially when the organisation faces a turbulent external environment; and ultimately it may lead to promote positive outcomes for the organisation to survive and prosper (Kamoche *et al.*, 2001; Akgun and Lynn, 2002; Vera and Crossan, 2005; Leybourne and Sadler-Smith, 2006). However, prior research has paid considerable attention on the centrality of improvisation in individual and group outcomes (Kamoche *et al.*, 2003) to the detriment of focus on organisational outcomes (firm performance). For instance, Moorman and Miner (1998b), Akgun and Lynn (2002) and Vera and Crossan (2005) study new product development as an improvisational outcome; Leybourne and Sadler-Smith (2006) investigate internal and external project outcomes; Souchon and Hughes (2007) focus on export performance as an outcome of export improvisation; while Hmieleski and Corbett (2008) examine venture performance as an outcome of entrepreneurial improvisational behaviour. This relationship between improvisation and organisational outcomes has appeared to be dubious in extant research and lacks empirical examination (*see* Vera and Crossan, 2005; Hmieleski and Corbett, 2008). Interestingly, no study has sought to trace and prove the association between organisational improvisation and firm performance as a whole, although much previous research tend to assume theoretically that improvisation may lead to superior performance through other possible contingent factors (Crossan *et al.*, 2005; Hmieleski and Corbett, 2008). Given the deficiency of empirical evidence and general lack of consensus on whether improvising is positive for improving firm performance, this emphasis deals with the need to develop a model and understanding of organisational

improvisation which is specifically based upon empirical investigation of the relationship between improvisation and firm performance.

In recent times, much attention has been focused on the issue of environmental turbulence in the improvisation literature. The impact of environmental turbulence on organisational improvisation has empirically been established by few researchers (*i.e.* Moorman and Miner, 1998b; Akgun and Lynn, 2002; Cunha *et al.*, 2003, Vera and Crossan, 2005; Cunha and Cunha, 2006b; and Akgunet *al.*, 2007). With regards to the effect of environmental turbulence, firms have to think and decide on the best approach of either planning or improvisational way in gaining greatest business outcome. Firms may face such changes occurring in the environment which are associated with new technologies, the preferences of customers and competitive intensity (Jaworski and Kohli, 1993). The changes in the environment can be either high or low turbulent. Environmental turbulent may give a positive or negative impact to planning and improvisational activities as well as organisational outcomes of performance. For example, when environmental turbulence is high, improvisation is possible and recommended because it increases the effectiveness of improvisational actions and lead to better performance (Vera and Crossan, 2001, 2006). In contrast, low turbulence environments may provide more value to planning outcomes (Vera and Crossan, 2001, 2006) as the need to improvise decreases and so its performance effect is likely to be minimal as a result.

The impact of turbulent environment or environmental turbulence on planning or improvisation actions is a significant topic which is currently discussed by scholars. In the computer industry, Eisenhardt and Tabrizi (1995) found that “extensive planning simply wastes time, especially in high-velocity industries such as computers” (Eisenhardt & Tabrizi, 1995: 106); and fast

strategic decision-makers consider the planning process as a “futile” exercise once the environment is shifting unpredictably (Eisenhardt, 1989). These incidents suggest that improvisational actions are critically important in creating better performance especially when organisations are faced with turbulent environment. Nevertheless, how far the statement on environmental turbulence affects the improvisational effectiveness is still ambiguous.

Further, when glancing back to jazz improvisation, it can be seen that the musicians always perform in fluctuating situations (*e.g.* audience response); and this reflects similar conditions in organisational settings where most organisations perform in turbulent environment (Crossan, 1996; Moorman and Miner 1998b; Akgun, 2002). This means environmental turbulence might give some moderating effect on the link between improvisation and performance. Whilst this assertion is intuitive it is not necessarily borne out as improvisation research in this domain is lacking. It is assumed in most discussions of improvisation that it is at its most useful in turbulent conditions, but as yet, this remains for the most part equivocal. Therefore, there is a knowledge gap to investigate in relation to environmental turbulence (from technology, market and competitive turbulence) as having a considerable contingent effect on the improvisation–performance link.

Due to this, it is important for this research to focus on high technology firms because many of these firms are progressively faced with ongoing challenge of competition, technological and market demand (high turbulent environment) (Morgan *et al.*, 2000; Doran and Gunn, 2002; Morgan and Strong, 2003) which require constant change and innovation (Eisenhardt, 1989); and

hence the tendency for organisational improvisation in their business process is likely to be necessary.

1.3. Research Objectives and Research Questions

From the background to this research, it has been identified that the main research objective of this study is to examine the antecedent factors that affect organisational improvisation from a strategic management perspective; and to identify how (if at all) improvisation affects firm performance. This research objective resulted in the formulation of a number of specific research questions as follows:

1. What antecedent factors are involved at the managerial level to the conditions for organisational improvisation?
2. What antecedent factors are involved at the organisational level to give rise to improvisational behaviour?
3. What is the relationship between organisational improvisation and firm performance?
4. What are the contingent elements that moderate the relationship between improvisation and firm performance?

1.4. Significance of the Study

Extant empirical evidence on organisational improvisation in strategic management is still ambiguous and limited. In the typical theory of strategic management process, most scholars suggest that managers have to undertake the strategy-making process accordingly from strategic planning to implementation and followed by constant strategic evaluation (David, 2001; Thompson and Strickland, 2004; Hitt and Ireland, 2005). But, in actual business situations, some strategic process such as strategy formulation and

execution could be simultaneously executed to generate real time action as it unfolds (Moorman and Miner, 1998b; Cunha and Cunha, 2002, Vera and Crossan, 2005). By noting this deficiency in the investigation of organisational improvisation from a strategic management view, this research seeks to provide additional contributions to existing theory and practitioners. For instance, by applying organisational improvisation as a corporate learning tool, it could train managers to be able to immediately access creativity in the moment or in spontaneous way and under pressure conditions. As a result, the company can be able to stimulate better decision-making processes, performance outcomes.

Secondly, this study contributes to research and managerial implications by integrating a number of ideas that have previously been explored independently or theoretically on the factors that drive improvisation (*for example, see*, Moorman and Miner, 1998b; Akgun and Lynn, 2002, Vera and Crossan, 2005; Leybourne and Sadler Smith, 2006; Chelminski, 2007). From this investigation, it is hoped that this study can provide a rational identification of key antecedents of improvisation which are based upon managerial and organisational factors; as most previous studies have extensively examined team improvisation instead (*e.g.* studies by Moorman and Miner, 1998b; Akgun and Lynn, 2002; Vera and Crossan, 2005). The identification of key antecedents of improvisation is essential for managerial practices as it could benefit managers in making quicker and better decisions, especially when dealing with unexpected business situations.

Third, a key significance of this study is that the findings in this study can play a part to knowledge and managerial practices by offering new evidence on the association between organisational improvisation and firm performance. To date, the study on improvisation and organisational

performance is limited and is still considered new in improvisational and management literature. Thus this context is beneficial to examine on how improvisation can help to stimulate better firm performance and under what conditions. Indeed, there may be situations where it is advisable not to improvise.

Fourthly, by examining external contingent factors, this thesis is expected to disclose how environmental turbulence can affect the association between organisational improvisation and performance. This research is fruitful for theory and practices. By adopting improvisation, it could help the firm to handle and stimulate crucial business situations when dealing with uncertainties and rapid changes in the environment. Hence, it is hoped that the manager is able to be more responsive and enhance performance under this turbulent environment.

Lastly, this study is also expected to provide a benefit to the Malaysian high technology-based companies, specifically in terms of empirical verification on how organisational improvisation can be fostered and if and how this determines firm performance. Beyond this, this study also expects to offer timely and relevant information to the Ministry of Science and Technology, and Innovation (MOSTI), Malaysia, especially in developing future projects and stimulating income to the Malaysian economy by enhancing practices in the high technology sector.

1.5. Chapter Feature and Organisation

This thesis consists of nine chapters. The first chapter (Chapter 1) introduces the background of the research, research objectives, research questions and the significance of this study to theories and practices. The next chapter (Chapter 2) continues with comprehensive reviews of literature from

extant research. It explains the definition and concept of organisational improvisation; the link between improvisation and strategic management, hence, the theoretical underpinnings of this study; and the weaknesses in existing research on the factors affecting improvisation and firm performance. Analyses of extant literatures are an effort to justify the development of the research model of this study and this research model is covered in Chapter 3, which develops the hypotheses for the foundations of organisational improvisation and firm performance.

Chapter 4 puts the spotlight on the research design and empirical method to be employed. This chapter explains the research design in which involves the intersection of philosophy (positivism stance), research strategies (employed a quantitative strategy), and specific research methods including data generation; the sampling process and the choice of sample and population for this study; data collection approach; the instrumentations; the type of measurement scale; details of questionnaire design; questionnaire validation process; and the actual data collection process.

Chapters 5, 6 and 7 extensively cover the analyses of data. Chapter 5 describes the descriptive analysis of the responding companies, the profile of those respondents, a test of non response bias, data screening and examination of each variable in this study. Chapter 6 explains the purification of constructed data through the analysis of reliability and validity; and the correlation between the thesis variables. The final empirical results chapter, Chapter 7, investigates the hypotheses testing results.

After the research analysis is completed, Chapter 8 presents a discussion based on the interpretation of the results for each of the hypotheses examined. These discussions will focus on a comparison between the results

of this study and previous research in the field. Lastly, Chapter 9 summarises the whole thesis, then followed by the reflections on the overall research process and a discussion on the potential implications of the findings to both theory and managerial practices. The thesis concludes with a discussion on the limitations of this study and directions for future research.

Chapter 2

Literature Review

2.1. Introduction

Chapter 1 covered the objectives of this research and the significance of this research on organisational improvisation. This chapter explains in thorough what organisational improvisation is; from its definition, the link between improvisation and the strategic management perspective as well as the theoretical underpinnings of this study. From the comprehensive review of extant literatures, this chapter also covers the identification of research gaps and the generation of the research framework of this study.

2.2. Organisational Improvisation

In recent times, organisational improvisation has emerged as being critically important in the business arena. Improvisation enables managers to continually learn while working and act spontaneously and creatively to consistently move products and services out of the door (Eisenhardt, 1997). It can potentially generate value to the company in terms of prudent change management, adjustability to adopt best practices as well as adding flexibility and innovation (Kamoche *et al.*, 2002; Leybourne, 2006). By practicing improvisation, organisations could gain a better understanding on how individual and groups in organisations cope with and coordinate the conflicting demands of existing time perspectives (Crossan *et al.*, 2005); learn and adapt under time pressures (Vera and Crossan, 2005); and remain flexible under turbulent environments (Cunha *et al.*, 1999).

Primarily, it is critical to understand the definition of improvisation from various areas so as to get a clear picture of the improvisation construct. There are a number of definitions of improvisation across prior literatures within multiple areas such as management (*e.g.* Hatch, 1997; Barret, 1998), product or organisational innovation (*e.g.* Bastien and Hostager, 1988; Brown and Eisenhardt, 1997; Kamoche and Cunha, 1998), organisational theory (Weick, 1998 and 1999), marketing or new product development (Moorman and Miner 1998a and 1998b), strategy and decision making (Perry, 1991; Crossan *et al.*, 1996; Eisenhardt, 1997) and organisational learning (Cunha *et al.*, 1999). These definitions of organisational improvisation derived from explicit and implicit manner; as well as from cognitive and sociological perspectives on improvisation (Cunha *et al.*, 1999). The definitions from extant studies of organisational improvisation can be summarised in Table 2.1.

TABLE 2-1: DEFINITIONS OF ORGANISATIONAL IMPROVISATION

Author	Definition
Bastien and Hostager (1988)	"the invention, adoption and implementation of new [...] ideas by individuals within the context of a shared awareness of the group performance as it unfolds over time" (p.583)
Perry (1991)	"formulating and implementing strategies together in real time" (p.51)
Weick (1993)	"when one organisational order collapse, a substitute is invented immediately" (p.640)
Moorman and Miner (1995)	Extemporaneous and deliberate organisational action" (p.9)
Eisenhardt and Tabrizi (1995)	"rapidly building intuition and flexible options so as to cope with an unclear and changing environment" (p.8); "... combining real time learning through design iterations and testing with the focus and discipline of milestones and powerful leaders" (p.108)

Ciborra (1996)	"efficiently generate new combinations of resources, routines and structures which are able to match the present, turbulent circumstances" (p.104)
Orlikowski (1996)	"accommodations to an experiments with (...) everyday contingencies, breakdowns, exceptions and unintended consequences" (p.65)
Hatch (1997)	"intuition guiding action upon something in a spontaneous but historically contextualised way" (p.181)
Kamoche and Cunha (1997)	"the ability to compose and perform contemporaneously" (p.362)
Crossan (1997)	"spontaneity of action (with a high) level of intuition" (p.39)
Barret (1998)	"fabricating and inventing novel responses without a prescript plan and without certainty of outcomes; discovering the future that (action) creates as it unfolds" (p.605); "prepare to be spontaneous" (p.606)
Moorman and Miner (1998a)	"composition converge with action" (p. 702)
Moorman and Miner (1998b)	"when the composition and execution of an action converge in time" (p.1)
Crossan and Sorrenti (1998)	"intuition guiding action in a spontaneous way" (p.156)
Pasmore (1998)	"created in real time" (p.6); "... emergent synergy" (p.6); "...behave in flexible fashion, but only within the bounds of control provided by a set of agreement" (p.8)
Kamoche and Cunha (1998)	"the merging of composition and performance, where both happen contemporaneously" (p.5)
Weick (1998)	"producing something on the spur of the moment" (p.19)
Cunha <i>et al.</i> (1999)	"the conception of action as it unfolds, by an organisation and/or its members, drawing on available material, cognitive, affective and social resources" (p.302)
McKnight and Bontis (2002)	"the ability to spontaneously recombine knowledge, process and structure in real time, resulting in creative problem solving that is grounded in the realities of the moment" (p.5)
Crossan <i>et al.</i> (2005)	"a time-based phenomenon" (p.130); "formulation and implementation occurs simultaneously by the same individual" (p. 131); "represent the meeting point of planning and opportunity,

	comprising a blend of strategy formulation and implementation" (quoted from Crossan <i>et al.</i> , 1996:131)
Vera and Crossan (2005)	"occurring in teams as the creative and spontaneous process of trying to achieve an objective in a new way" (p.205); "as a spontaneous process, improvisation is extemporaneous"(p.205); "as a conscious choice people make rather than as random behaviour" (p.205)
Leybourne and Sadler-Smith (2006)	"a combination of intuition, creativity, and bricolage that is driven by time pressure" (p.484); "relate to how thoughts and action develop over time and in response to environmental cues and stimuli" (p.484)
Leybourne (2006)	"combining known and unknown routines in different contexts, and can be considered from a philosophical as well as an organisational stance" (p.13)
Hmieleski and Corbett (2006)	"occurs when resource constraints are prohibitive and the entrepreneur finds himself/herself faced with a novel problem or opportunity" (p.46)
Chelminski (2007)	"involves a high degree of spontaneity and high level of intuition" (p.115)
Jambekar and Pelc (2007)	"an expression of capability to sense emerging reality and to act in harmony with it". (p.261); "to foster an ability to balance control and spontaneity". (p.261)
Hmieleski and Corbett (2008)	"the ability to extemporaneously create and execute new plans on the fly" (p.483)

Referring to various definitions and from a range of different fields, the definition of organisational improvisation can be summarised as an action taken in real time situations where it involves a high degree of spontaneity, creativity and intuitive insight by individuals, groups or the whole organisation. In this study, we will focus on organisational improvisation. The organisation must have the ability to formulate (plan or compose) and execute (implement) actions simultaneously when pursuing improvisational activity. The narrower the time gaps between planning (composition) and execution,

the more the firm acts through an improvisational process (Moorman and Miner, 1998b). This signifies that the acts of composing and performing must not be separated (Bastien and Hostager, 1988). That is the reason why Moorman and Miner (1998b) use the length of time between the design and execution of an action in measuring improvisation. Nonetheless, their measurement is too dependent on the “*subject’s perception of improvisation (refer to second de facto) and the restriction of improvisation to its temporal dimension*” (Cunha *et al.*, (1999:110). This measurement of temporal convergence between planning and execution is more related to an objective although partial measure of organisational improvisation (Cunha *et al.*, 1999). Due to this limitation, it is significantly important to find out what are the exact elements that can be described as organisational improvisation.

2.3. Measuring Improvisation

“*Intuition guiding action in a spontaneous way*” (Crossan and Sorrenti, 1997:155) is one of the most accepted definitions of improvisation. This apparently manifests the elements of improvisation in which it can be categorised as a socio-cognitive construct and can be described as an unconscious mode of information-processing (Akgun *et al.*, 2005) and spontaneity (Barret, 1998; Crossan and Sorrenti, 1997). There are several constructs that can be associated with improvisation that need to be used in measuring organisational improvisation. Leybourne and Sadler-Smith (2006) suggest that improvisation consists of a combination of intuition, creativity and bricolage. Meanwhile, Souchon and Hughes (2007) in their study on export improvisation have combined the creativity and bricolage dimensions and provide three valid dimensional measures which consist of bricolage/creativity, pressure/stress, and action/persistence. On the other hand, Cunha *et al.* (1999) find that the most commonly associated constructs with

improvisation in the literature are creativity, adaptation and innovation (Cunha *et al.*, 1999).

Creativity may occur during the improvisational process, when actions are absolutely novel; whilst adaptation and innovation elements can occur before (Cunha *et al.*, 1999) or through the implementation of improvisation (Vera and Crossan, 2005). However, it is relatively limited to use adaptation and innovation alone as reflecting the improvisation. For example, if the organisation faces a highly turbulent environment, adaptation may be limited to be improvisational due to the limited time to effectively respond to an external threat (Cunha *et al.*, 1999). This scenario signifies that the adaptation element can be categorised as the element that drives improvisation, but not as a descriptive element of improvisation. A same case appears to the innovation element where it cannot count as an element of improvisation because innovation may be planned and scheduled (Cunha *et al.*, 1999) and it is more output oriented which comes out from the creative ideas within organisations (Vera and Crossan, 2005). That is the reason why Vera and Crossan (2005) choose creativity as a descriptive element of improvisation because "*creativity incorporates the search of novelty and usefulness in improvisational actions*" (p.205).

Creativity alone is not enough to create organisational improvisation. Vera and Crossan (2005) have also used the element of spontaneity to reflect organisational improvisation (Vera and Crossan, 2005). Looking through the improvisational literature, many scholars state that improvisation is extemporaneous or spontaneous (Moorman and Miner, 1995; Barret, 1998; Crossan and Sorenti, 1997; McKnight and Bontis, 2002; Vera and Crossan, 2005; Hmieleski and Corbett 2006 and 2008; Jambekar and Pelc, 2007;

Chelminski, 2007). It is believed that individuals or managers in organisation are more responsive to situations on the spur of the moment. This spontaneity reaction may create the ability for the organisation to simultaneously formulate and implement the actions and/or strategic decisions. This means that the spontaneity dimension incorporates a time direction to the improvisation construct (Vera and Crossan, 2005). Therefore, it is significant to count not only for creativity as reflecting the improvisational construct but the spontaneity element may also need to be considered as an important element to measuring improvisation.

2.4. The Concept of Improvisation

The concept of improvisation can be highlighted into two perspectives. First, improvisation can be present in all social settings, including routine and non-routine situations (Webb and Chevreau, 2006); and time pressures and uncertainty (Crossan *et al.*, 2005) where it suggests improvisation is lying along a continuum (*e.g.* low to high). According to Webb and Chevreau (2006), routine settings involve higher degrees of conventionality and lower degrees of improvisation, and vice versa for non-routine settings. This signifies that improvisation involves some degree of novelty and intentionality, rather than following existing routines or indicating random deviation from previous routines (Berliner, 1994; Hatch, 1997; Weick, 1998; Baker *et al.*, 2003). However, Ciborra (1999) contends that improvisation does not belong to a regular chronology or in a linear sequence of events. It engages onto the qualities of suddenness and extemporaneous, that is outside the flow of time and not as planned (Ciborra, 1999). This scenario is consistent with full-scale improvisation, which is one of four scenarios suggested by Crossan *et al.*, (2005). Under this condition where time is scarce and the environment is undecipherable, the organisation might go for highly spontaneous and

creative actions where formalised planning is impossible (Crossan *et al.*, 2005). According to Crossan *et al.*, (2005), the scenarios lie in connection with the level of environmental uncertainty and time pressure from low to high. They categorised four scenarios namely planning, ornamented improvisation, discovery improvisation and full-scale improvisation (Crossan *et al.*, 2005).

Under the second perspective, improvisation is suggested to engage with individuals and organisations (Moorman and Miner, 1998b; Crossan *et al.*, 2005; Webb and Chevreau, 2006). For instance, at the individual level, it is important for the researcher to classify and alter their roles to meet the demand; as well as to identify various factors associated with improvisation (Webb and Chevreau, 2006). Whereas, at the organisational level, researchers have attempted to study the ways in which organisations change in order to meet new demands (Webb and Chevreau, 2006). Organisations improvise when they face a demand for speed and action in an unplanned yet unexpected event (Akgun and Lynn, 2002). Those demands could either originate from an internal source (enforced through leadership or members) or an external factor (enforced through environment) (Moorman and Miner, 1998b; Vera and Crossan, 2005).

2.5. Improvisation: Previous Knowledge Gaps

Most extant literatures on improvisation are largely based on jazz music and the theatre metaphor (Bastien and Hostager, 1988; Kamoche and Cunha, 1997 and 1998; Barret, 1998; Pasmore, 1998; Moorman and Miner, 1998a and 1998b; Weick, 1993 and 1998). Jazz or theatre improvisation refers to the fact that the artistic performance is not purely reliant on the scores or scripts because jazz musicians and theatre actors engage in spontaneous acts which are largely dependent on interaction with the audience. It occurs in a moment

or is extemporaneous, unexpected and unplanned (Ciborra, 1999). Improvisation in businesses could be viewed in a similar way where the business strategy and a set of policies/actions/decisions (script or scores) could be an immediate outcome of interactions with internal and external environmental forces. The interactions of internal forces can be depicted in the scenario of organisational structure that explains the functions and interactions of employees (musicians or actors), which have specific roles to be played, such as in marketing, production or administrative work (saxophonists, guitarists or heroes, heroines), and the role of the CEO (composer or director) who has to ensure the strategy unfolds as intended (Crossan and Sorrenti, 1997). Meanwhile, the competitors, customers, retailers, stakeholders and shareholders (audience) are the possible external factors that significantly affect the improvisational process. This scenario therefore depicts *the system of interaction* which emphasises *collective improvisation* (Moorman and Miner, 1998a).

Collective improvisation is one of the metaphors for group improvisation (Moorman and Miner, 1998a). It demonstrates the notion of conversation, where at least two agents interact around a theme to compose while executing (Moorman and Miner, 1998a). It is meaningful to see such processes as collective improvisation (Moorman and Miner, 1998a) rather than to look at only the impact of actions by individuals. However, Weick (1993; 1998) asserts that jazz threatens to become a blind spot in organisational improvisation theory. During theatre and jazz performances, the teams of improvisational actors and musicians are frequently described as *leaderless*; and which this fact has been suggested as a limitation of the arts analogies (Vera and Rodriguez-Lopez, 2007). Composers or directors are assumed as leaders, but during the performance or play, only musicians or

actors can play roles for improvisational activities; therefore it seems to appear a leaderless scenario. This scenario does not reflect well in an organisational setting. In organisations, improvisational activity is not only participated from organisational team members, but leaders (top executives) must play significant roles for improvisation and making decisions.

Further, the musicians tend to use pre-planned repetitive material to keep the performance going when musical ideas have to be conceived and executed in fast tempos (Weick, 1998). This means that *“the faster the tempo, the more likely the musicians fall back on the predictable use of a formerly mastered vocabulary”* (Weick, 1998:552). This faster tempo reflects the case of organisations facing highly turbulent environments. During turbulent environments, the companies may refer to past experience (Weick, 1998) for successful improvisation. But this analogy has been argued by Ciborra (1999) that the root of improvisation lies on *‘because of’ motives* which guide action. *“The ‘because-of’ motives are tacit and lie in the background of the explicit project at hand; which fall outside the rationality during the performance of the action”* (Ciborra, 1999:85).

The argument by Weick (1998) and Ciborra (1999) gives the logical notion of the root of improvisation. However, this scenario does not fully exemplify the reality of business. In some businesses, organisations may be faced with different degrees of problems and environmental turbulence (Cunha *et al.*, 2003; Cunha and Cunha, 2006b). The managers tend to find other alternatives for improvisation at an organisational level rather looking back for past experience (Weick, 1998). The tendency for the managers whether to either consider a deliberate process or unplanned condition for improvisational activity is significantly happened. For example, in some cases,

the motivation for improvisation at the organisational level may be the presence of opportunities, speculative information or simply a recognition that actions need to be taken to reinforce the firm. In which case, there may be no past experience to rely on. This signifies that *“the current adoption and entrenchment of the comparison view of metaphor (either jazz or theatre) in organisational writings in particular seems a premature conclusion, indicating that organisation theory has been rather insulated and not sufficiently informed by theoretical developments and research on metaphor in cognitive science”* (Cornelissen, 2005:756). Therefore, a growing body of work suggest research move away from an insulated view of improvisation based on jazz metaphors and move forward to examine the root of the organisational improvisation process (Weick, 1993 and 1998; Hatch, 1997; Crossan, 1998; Moorman and Miner, 1998b; Baker *et al.*, 2003; Vera and Crossan, 2005).

To date, however, the literature has been relatively silent with respect to improvisation as an organisational process, particularly from a strategic management perspective. Some researchers argue that organisations may not only improvise deliberate changes in response to some unexpected problems, but may also improvise strategically (Eisenhardt and Tabrizi, 1995; Moorman and Miner, 1998b; Baker *et al.*, 2003). The study of improvisation in organisations, specifically; where the notion of improvisation lies as part of the strategy process (not based on jazz or theatre metaphors but on strategy process theory) is crucial for the development of improvisation theory and grounding it in strategic management research, rather than the constant preoccupation with grounding it in jazz. Therefore, the next section will deliver an in-depth discussion of improvisation from the strategic management perspective and the underpinning theory in this study.

2.6. Improvisation from the Strategic Management Perspective

Strategic planning is undoubtedly important in any kind of business activity. All organisations, regardless of size, require proper and effective planning in order to define their business strategy, reach desired objectives, develop targeted capabilities and strengthen their organisational competencies and competitive advantage. It may also provide overall direction of to the strategic management of the organisation and offer specific objectives in such important areas like accounting and finance, marketing, human resource, research and development, operation management and information technology as well as the necessary actions to improve organisational performance.

Strategic planning can be viewed in terms of either content or process aspects (O'Regan and Ghobadian, 2004; Falshaw *et al.*, 2006). The content aspect relates to the distinct elements of the strategic plan whilst the process viewpoint relates to the mechanisms for the development of the strategic plan (Falshaw *et al.*, 2006). Some studies report that the strategic planning process is a critical aspect of decision-making and performance (Ansoff, 1991; Dickson, 1992; Simon, 1993; Grant, 2003). According to Andersen (2004), the strategic planning processes can be defined as organisational activities that systematically discuss mission and goals, explore the competitive environment, analyse strategic alternatives, and coordinate actions of implementation across the entire organisation. A formal strategic planning process is a deliberate means to include factors and techniques in a systematic way to achieve specified tasks (O'Regan and Ghobadian, 2002). It can also generate benefits in terms of improved staff awareness and participation (O'Regan and Ghobadian, 2002) and is a valuable activity even in uncertain and ambiguous situations like firm formation (Delmar and Shane, 2003).

However, some empirical studies have argued against the value of formal strategic planning, due to the absence of a significant relationship between planning and performance (Robinson and Pearce, 1983; Fredricksons and Mitchell, 1984; Falshaw *et al.*, 2006).

Hopkins and Hopkins (1997) note that the strategic planning process consists of three major components namely strategy formulation, strategy implementation and strategy evaluation and control (as depicted in Figure 2-1). Some scholars identify that strategic planning, in strategic management, involves developing a full set of commitments, decisions and actions in order to achieve strategic competitiveness and earn high business outcomes (*e.g.* new product development, organisational performance). According to David (2001), strategic management is the art and science of formulating, implementing and controlling and evaluating cross-functional decisions that will enable an organisation to achieve its goals. The strategic management process can be classified into three levels of components: strategic inputs, strategic actions and strategic outcomes (Hitt *et al.*, 2005). Extant theory holds that firms formulate and implement strategy exactly as described by the strategic management process (Mintzberg and Waters, 1985). It starts with identifying mission and objective of the firm, then analysing the internal and external environmental forces (as strategic inputs), followed by formulating alternative strategies and executing the chosen strategy (David, 2001; Thompson and Strickland, 2004, Hitt *et al.*, 2005). Strategy formulation and implementation are identified as strategic actions in which the process is a prerequisite to achieving organisational outcomes (Hitt *et al.*, 2005).

In reality, though many firms undertake strategic planning of their firm's strategies, most of them find it necessary to modify the strategy during

the implementation process in order to enhance performance. That is to say, firms have to think of emergent strategy (Mintzberg and Waters, 1985) specifically when facing with unexpected events (Faraj and Sproull, 2000). Mintzberg and Waters (1985) emphasise that emergent strategy can be identified as openness, willingness to learn, flexible and responsiveness. Several well-known firms apply at least partly emergent strategies. For instance Johnson & Johnson intended strategy (originally supply an antiseptic gauze and medical plasters) was to compete in the medical products market; but in response to complaints about irritation caused by some of its medical plasters, the company implemented its emergent consumer products strategies by enclosing a small packet of talcum powder with each of the medical plasters it sold (Barney and Hesterly, 2006). Shortly the customers were asking to purchase the talcum powder by itself (Barney and Hesterly, 2006). Due to this, its emergent consumer product strategies currently generate over 40 percent of total corporate; and thus boosted its financial performance (Barney and Hesterly, 2006) as well as its intangible performance (e.g. brand value).

This scenario shows that when customer preferences and demands change rapidly (the conditions of market turbulence), the company turnover (firm performance) can also increase dramatically if addressed swiftly. From this scenario, it is therefore expected that most companies need to apply emergent approaches (or improvise) in some form or another due to the need to adapt to customer and market demand, market opportunities, technological changes or competitive reactions in an industry as well as to enhance performance (outcomes) (Mintzberg and Waters, 1985). Thus, as indicated above, is critical to identify a fit between the characteristics of the environment and those of the organisation that lead to high performance

(Donaldson, 2001). It is assumed that the better the fit the higher the performance (Donaldson, 2001). Therefore, firms must improvise organisational strategies to remain in fit with their environment, or otherwise risk misfit that might harm their business performance.

The debate between Mintzberg (1987) and Ansoff (1991) characterise the view that the firm's strategy formulation processes are either deliberate or emergent (Falshaw *et al.*, 2006). Mintzberg and Waters (1985) argue that there is often intended and realised strategy. They are linked by a deliberate strategy-making process that results in the realised strategy but will inevitably have unrealised strategy elements (that is, a strategy a firm does not actually implement) and of course, elements of strategy that simply emerged over time or radically reshaped once they are initially implemented (as illustrated in Figure 2-1) (Mintzberg and Waters, 1985; Barney and Hesterly, 2006). This means that strategies and plans are not necessarily purely formally produced but relatively evolve over time through the decisions and actions of the organisation - even through the absence of intentions (Mintzberg and Waters, 1985; Mintzberg, 1987; Brews and Hunt, 1999; Falshaw *et al.*, 2006). However, some researchers state that an emergence approach suggests strategy formulation and implementation occur simultaneously (Brews and Hunt, 1999, Falshaw *et al.*, 2006). This condition is similar to the concept of improvisation proposed by some improvisational scholars (*e.g.* Perry, 1991; (Crossan *et al.*, 1996; Moorman and Miner, 1995; Moorman and Miner, 1998b; Kamoche and Cunha, 1998; Akgun *et al.*, 2005, Hmieleski and Corbett, 2006). This is not necessarily the case as, following the various works of Mintzberg, an emergent strategy is one that emerges over time from potentially ad hoc series of decisions rather than a conscious and deliberate improvisational act.

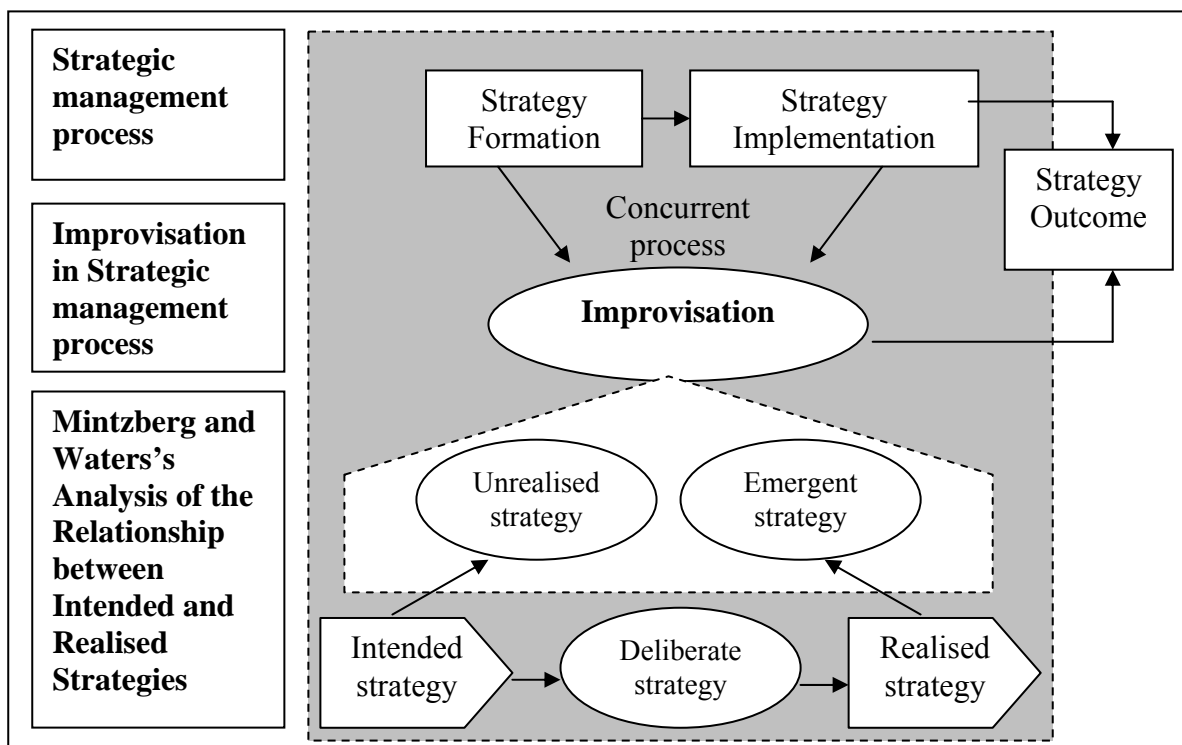
On other conceptual understandings, Gibbons and O'Connor (2005) identify that an organisation's adoption of either deliberate or emergent approaches is dependent on the company's strategic position and organisational structure as well as individual variables such as top management experience. This signifies that there are a number of potential antecedents that are among the critical factors that could determine whether an organisation follows either formal strategic planning (deliberate) or a more improvisational (emergent) process will be employed. Grant (2003), on the other hand argues that this debate has dubious validity due to the lack of empirical research and that fact that the debate between "strategy as rational design" and "strategy as emergent process" has been based upon a misconception of the reality of strategic planning (Falshaw *et al.*, 2006). "Strategy as rational design" occurs as a business planning process while "strategy as emergent process" involves an improvisational process (Falshaw *et al.*, 2006). According to Harrington *et al.* (2004), planning should be treated as a continuum in order to better accept the idea that both approaches (deliberate and emergent) can be present in organisations.

Improvisation exists in many descriptions of emergent strategy and action (Crossan *et al.*, 2005). Many scholars note that improvisation represents the meeting point of planning and opportunity and comprises a blend of the strategic processes of formulation and implementation (Crossan *et al.*, 1996; Moorman and Miner, 1995; Moorman and Miner, 1998b; Kamoche and Cunha, 1998; Akgun *et al.*, 2005, Hmieleski and Corbett, 2006 and 2008). This process may be conducted by the same individual or decision maker (Crossan *et al.*, 1996, Moorman and Miner, 1998b) in order to enhance business outcomes. Moorman and Miner (1998b) claim that the greater the time pressures to make a decision, and thus the narrower the time gaps between planning and

implementation, the more the firm is likely to proceed through an improvisational process. In other words, abandon formalised planning in favour of improvising.

By noting the aforementioned conceptual perspectives of the strategic management process and the typology of strategic approaches presented by Mintzberg and Waters (1985), these combinations of concepts can be linked towards the creation of improvisational practice in the strategic management perspective. Firms following an emergence strategy approach need to create strategic formation and implementation as a concurrent process towards gaining the best strategic outcomes. This concurrent process of strategic management therefore could be identified as improvisation. Figure 2-1 illustrates the relationship between the strategic management process, the typology of strategic approaches and improvisation.

FIGURE 2-1: RELATIONSHIP BETWEEN STRATEGIC MANAGEMENT PROCESS, MINTZBERG'S TYPOLOGY OF STRATEGIES AND IMPROVISATION



The concept of improvisation in strategic management gives rise to the idea that an improvisational approach is significantly driven by the effects of internal and external environmental factors. As suggested by Gibbons and O'Connor (2005), internal factors such as a company's strategic position and structure, top management experience and expertise should be important antecedents that determine whether firms follow a strategic process of either deliberate or emergent; and in this case these antecedents could lead the organisation towards the improvisational process. Meanwhile, the external environmental factors (such as high changes of customer and market demand, market opportunities, technological changes or the competitive reactions in an industry) are assumed to have a significant effect on the relationship between improvisation and outcomes such as organisational performance. This means that, in order to enhance performance, it is much better for organisations to modify their business processes and activities to fit with their environment; as such, improvisational activity is likely to be crucial in this endeavour to rapidly adapt the firm and its actions to best suit the environmental conditions at hand. The next section will explain thoroughly the theoretical underpinnings of this study.

2.7. Theoretical Underpinnings

In developing the research model it is necessary to have a clear theoretical underpinning that provides a stable rationale for the model of organisational improvisation that this study seeks to develop and consequently test. In this case, the view of strategy as a process is taken as a core theory of this study and this is supplemented by contingency theory. Strategy process theory is central in strategic management in explaining how strategy occurs and strategic management happens. If it were not a process then it would be haphazard and as such, following the definition of strategic

management, would not be *strategic*. Deliberate strategic planning or improvised strategic decision-making are the result of a process and managerial and organisational elements motivate them to occur (Hax, 1990). For instance, formal strategic planning is an outcome that is motivated by formal procedures, systematic information searches and environmental scanning and precise goal setting (Bailey *et al.*, 2000, Hitt *et al.*, 2005). Without these antecedents in place it is less likely that a formal strategic planning process will arise or be employed. Similarly, from the literature it is apparent that there are managerial and organisational elements which in theory give rise for improvisation to occur but there is little in the way of empirical evidence to demonstrate (a) what antecedent factors are involved at the managerial level; (b) what antecedent factors are involved at the organisational level to give rise to improvisational behaviour; (c) what impact this has upon performance and (d) under what contingencies. Consequently, the model is developed from the perspective of strategy being a process and is supplemented by contingency theory (the latter is discussed later and the former first). In sum then, improvisation does not necessarily just happen from thin air. Strategy process theory suggests that organisational and managerial factors will in some way contribute to enabling it to occur as it is ultimately a part of the strategy-making process. Decisions to deviate from plans or take creative and spontaneous actions still have motivators or processors elements to them that require careful strategic management as, as is hypothesised, there are potentially very important performance benefits that can accrue from improvising in the strategy process and indeed improvising in the strategy process may well be preferable to planning under different conditions (*for example*, turbulent environments).

2.7.1. Strategy as Process

The writings of Chaffee (1985) indicate areas of agreement within the strategic management literature as to what strategy entails. Specifically, strategy (a) concerns the organisation and the environment; (b) is complex; (c) affects the welfare/performance of the organisation; (d) is not purely deliberate; (e) exists in different levels of the organisation; (f) involves various thought processes, and; (g) involves issues of content and process. Thus, strategy formation can be considered complex and involves issues of process and as can be derived from Chaffee (1985), issues of context.

Authors such as Varadarajan and Jayachandran (1999) contend there are three aspects to the strategies of firms. Specifically, aspects of strategy content, formation and implementation. *Strategy content* is referred to by Varadarajan and Jayachandran (1999) as “*what the strategy is*” (1999: 120). A more detailed account portrays strategy content as the main actions of the proposed strategy so as to effectively position the organisation within its environment (Montgomery *et al.*, 1989; Chakravarthy and Doz, 1992; Lynch, 2003). This, of course, is regardless of how the end strategy was achieved: be it through planning or improvisation. *Strategy formation* is considered as activities and decisions engaged in for determining strategy content (Varadarajan and Jayachandran, 1999). *Strategy implementation* is considered as the actions initiated to realise the strategy (Varadarajan and Jayachandran, 1999). A more specific description is given by Noble and Mokwa (1999) whereby strategy implementation is the actualisation of strategy through the communication, interpretation, adoption and enactment of a strategy.

In terms of strategy formation and strategy implementation, strategy-making has typically been considered in either/or terms (Hart and Banbury,

1994) be it in terms of rational or incremental decision-making (Fredrickson, 1984; Dean and Sharfman, 1993), or separated into formation and implementation activities (Andrews, 1971; Porter, 1980; Moorman and Miner, 1998a). Consequently, strategy formation and its implementation are often considered separately (Moorman and Miner, 1998a; Menon *et al.*, 1999; Noble and Mokwa, 1999; Morgan *et al.*, 2000) in academic research whereby researchers focuses on one or the other in a given study. This separation is typical in organisational settings too and is often one reason why implementation is difficult as employees see strategy has already been developed and is thus forced upon them in many cases. British Airways is a good example of this fact. That is not to say however that strategy formation is independent of strategy implementation (Mintzberg, 1990; Cespedes and Piercy, 1996). The key element of improvisation, as discussed previously, is the convergence of strategy formation and implementation where it is suggested that both occur simultaneously. Therefore when improvising, unlike in typical formalised strategic planning, strategy is not a step-by-step process but a fluid process where decisions and actions converge.

The strategy formation process, hereby referred to as the strategy process, has been extolled as being at the heart of all strategic management research (Chakravarthy and Doz, 1992). Despite this assertion however there are several differing views on what is 'the strategy process' and this has led to several conceptualisations of it, leading to Mintzberg and Lampel's (1999) description of the field of strategy process as being eclectic. Table 2-2 illustrates the considerable number of strategy process perspectives identified in extant strategy process literature. The strategy process perspectives presented in Table 2-2 are far from exhaustive but the sheer number of strategy process perspectives presented does serve to illustrate the wide

ranging nature of the literature, and does raises criticisms for practical application due to the complicated and unwieldy nature of strategy process research (Menon *et al.*, 1999) and highlights the absence of convergence that exists within the literature (Hart and Banbury, 1994).

TABLE 2-2: STRATEGY PROCESS PERSPECTIVES IN EXTANT LITERATURE

Author(s)	Strategy Process Models
Allison (1971)	Rational Organisational Bureaucratic
Mintzberg (1973)	Entrepreneurial Planning Adaptive
Grandori (1984)	Optimising Satisficing Incremental Cybernetic Random
Chaffee (1985)	Linear Adaptive Interpretive
Mintzberg and Waters (1985)	Entrepreneurial Planned Ideological Umbrella Process Consensus Unconnected Imposed
Ansoff (1987)	Systematic Ad Hoc Reactive Organic
Hart (1992)	Command Symbolic Rational Transactive Generative
Mintzberg and Lampel (1999)	Design Planning

	Positioning
	Entrepreneurial
	Cognitive
	Learning
	Power
	Cultural
	Environmental
	Configuration
Hendry (2000)	Rational
	Action
	Interpretive
Cummings and Wilson (2003)	Strategy as Ethos
	Strategy as Organising
	Strategy as Intention and Anticipation
	Strategy as Orchestrating Knowledge
	Strategy as Data Plus Sense-Making
	Strategy as Creativity
	Strategy as Exploration and Interconnection
	Strategy as Systems Thinking
	Strategy as Process, Power and Change
	Strategy as Marketing
	Strategy as Numbers
	Strategy as Decision Making
	Strategy as Orientation and Animation

This wide range of views of strategy does not mean however that there is no consensus regarding the core aspects of the strategy process. Research into strategy process has indicated that the strategy formation process is founded upon a pattern or stream of decisions (Mintzberg and McHugh, 1985). Furthermore, it has been stated (Hutt *et al.*, 1988; Chakravarthy and Doz, 1992) that the foundations for the process school of strategy formation can be traced to research on strategic decision making under conditions of bounded rationality (March and Simon, 1958; Cyert and March, 1963; Simon, 1976).

Explicitly, strategy formation takes place under conditions of bounded rationality where decision making and strategy formation is constrained as

strategists do not have access to full information and they have a limited capacity for information processing and storing, which in turn can result in organisational improvisation occurring. Thus the capacities of managers to form strategies or take actions effectively are constrained by bounded rationality. As such, strategy, be it based on planning or improvisation, is in some way affected by processes and structures (*e.g.* information processing and organisational structure) (Miles *et al.*, 1978), as well as the characteristics of the manager in how they respond to conditions of bounded rationality (*e.g.*, reliance on past experience, attitude towards making risk and uncertain decisions *etc.*).

2.7.1.1. Information Processing and the Strategy Process

Discussions on the strategy process with respect to the earlier dialogue on bounded rationality highlights the importance of effective information processing in the strategy process. The role of information processing in the strategy process is highlighted by Hutt *et al.* (1988), Chakravarthy and Doz (1992) and Mintzberg and Lampel (1999) whereby these authors indicate that (a) information processing is an important dimension of the original theories of strategy formation (Cyert and March, 1963) and (b) information processing is prevalent in several schools of strategy process (Mintzberg and Lampel, 1999).

Information in this context is defined mostly to encompass ideas, organisational communications, documents, records and knowledge shared within an organisation. According to some experts, indeed, organisational information processing can be defined as the information flows occurring in and around organisations (Knight and McDaniel, 1979) which gathered and interpreted by organisations participants (Berente *et al.*, 2009). This

information processing consists of locating/acquiring and capturing/retrieving information which relates on organisation and stored/dissemination of information (Gioia and Manz, 1985; Anand *et al.*, 1998; Yang and Lynch, 2006). The accepted view of information processing in the strategic management literature is that of Huber (1991). Huber (1991) discusses this as a four stage of process of information acquisition, distribution, interpretation and memory (storage).

In acquisition and retrieval phase, organisations seek some piece of information or knowledge. It may originate from inside the organisation (*e.g.* knowledge sharing and communications among employees through department's activities or meetings) or outside the organisation (external environment *e.g.* market or competitors). This information may be retrieved, disseminated or stored over computers or on paper. Upon acquiring and disseminating information or knowledge it is necessary to put meaning to it through interpretation, and preferably, shared interpretation. Information processing cannot happen without this stage. Raw information and perhaps combing with several pieces of information can be interpreted to reveal important facts or observations on competitors, customers, markets and so forth that can be then used in decision-making. However information processing is as yet not complete. When information is stored or disseminated and then interpreted, a number of employees within the organisation should be able to retrieve it over time; therefore information needs to be stored as part of organisational memory. Following these four stages, information has been processed and organisational learning is said to have then occurred (Huber, 1991).

Information processing is seen as a key aspect of achieving desired outcomes such as superior performance (Kohli and Jaworski, 1990; Glazer, 1991; Jaworski and Kohli, 1993; Sinkula, 1994) and hence with respect to the strategy process there is a need for greater research into the role and effects of information processing (Hutt *et al.*, 1988; Glazer, 1991; Sinkula, 1994), and so, how this relates to improvisation. In departing from the notion of information processing, the strategy process has been noted as being concerned with several other organisational aspects separate to information processing. Specifically, issues of structure and the manager. Accordingly, these will be discussed in turn.

2.7.1.2. Organisational Structure and the Strategy Process

Organisational structure impacts upon the strategy formation process in that it can dictate in some respects the range of strategic alternatives available to an organisation when formulating strategy (Lynch, 2003). Strategic management authors have long since debated the arguments that 'strategy follows structure' (Hall and Saias, 1980) and 'structure follows strategy' (Williamson, 1975; Chandler, 1987) whilst others through the emergent (or improvisational) approach claim the link is far more complex (Corey and Star, 1971; Mintzberg, 1978; Piercy, 1998; Lynch, 2003) where both strategy and structure are interlinked. Specifically, strategy and the structure associated with it may need to be developed at the same time so that as the strategy develops, so does the structure. In turn, the organisation learns to adapt to its changing environment; that is, to develop strategic fit (Lynch, 2003). In other words, the convergence of strategy formation and implementation relates to improvisation. It has been stated that the impact of process and organisational structure on strategy has been underplayed (Prahalad and Hamel, 1994). Given this it may be appropriate to examine in

more detail the linkages (and the effects) between the structural aspects of the organisation and improvisation.

“Organisational structure refers to the formal distribution of work roles and functions within an organization which coordinate the various functions of subsystems within the organization to efficiently attain the organisation’s goals” (Tetrick, 1998:1990). This indicates that organisational goals and structure is interlinked where the structure represents a coordinated set of subsystems to facilitate the accomplishment of the organisational goals. Nonetheless, organisations must first clarify their goals in order to develop their organisational structure. Previous researchers believe that clarity of goals can increase decision speed (Cooper and Kleinschmidt, 1994; Murmann, 1994; Cooper *et al.*, 1998), particularly in strategy formation process.

In organisational structure, authors such as Slevin and Covin (1997) have distinguished between two types of organisation structure, namely mechanistic structures and organic structures. Mechanistic structures were described as being characterised by *“...centralised decision making, strict adherence to formally prescribed rules and procedures, tight control of information flows, and carefully constructed reporting and workflow relationships...”* (Slevin and Covin, 1997:193). Literature suggests such heavy centralisation of strategic decision making and the following of strict rules and procedures may lead to inertia (Cyert and March, 1963; Huff *et al.*, 1992; Lant *et al.*, 1992) within the organisation and such centralised decision making processes could stifle effective strategy formation (Janis, 1982), and certainly stop organisational improvisation. In a similar vein, the tight of control of information flows is also a characteristic that can be identified with mechanistic structures. As

discussed earlier, tight control of information flows could lead to bounded rationality and ineffective strategy formation, be it planned or improvised.

Organic structures on the other hand are the opposite of mechanistic structures. Organic structures were portrayed by Slevin and Covin (1997) as being characterised by “...decentralised decision making, organisational adaptiveness and flexibility, open communications, and a de-emphasis on formal rules and procedures...” (p.193-194). In contrast to the previous structure type, organic structures focus on flexibility and openness with decentralised decision-making as a central platform. This view suggests managers act as sponsors where strategy emerges from below and managers merely recognise and approve it. It could be argued that organisations with organic structures may have more emergent strategy formation processes and so more improvisational processes as a result (Mintzberg, 1978). An organic structure is appropriate in an uncertain or turbulent environment. This structure increases flexibility in the organisational structure as it goes beyond departmental barriers. Hence, flexible characteristics in organisation resembling the organic structure can be an important element for strategy formation process.

With regards to information processing, Bartlett and Ghoshal (1993) describe a ‘managerial theory of the firm’ akin to organic organisational structures as described above. This managerial theory of the firm emphasises the role of middle management in facilitating open communications and information flows within the organisation. As these different types of organisational structures become built into the organisation over time it is likely that they will become standardised and as indicated by Cyert and March (1963), decision-making would become captured within standard

operating procedures dubbed the “...*the memory of the organisation*” (p. 101), which is once more an aspect of information processing (Huber, 1991) and which could be relied upon to supplement information in undertaking improvised decision making.

Different informational properties are an outcome of different structural forms (*e.g.* mechanistic or organic structure) in organisation (Roy, 2008). This scenario promotes different capacity to facilitate risk control (Roy, 2008). Roy (2008) asserts that organisational structure plays an important element to influence on the elicitation of the desired risk-taking behaviour. “*Risk taking can be viewed as the susceptibility to problems such as moral hazard, conflict of interest and adverse selection that are precipitated due to the decision context and availability of information*”(Roy, 2008:122). This indicates that risk-taking behaviour within organisation is an outcome of organisational structure; and therefore should be considered when formulating strategy. Though organisational risks is not an element of structure, but the strong association between structure and risk-taking capacity could benefit the strategy formation process; and therefore risk-taking behaviour should be noted as an element of effective organisation structure.

2.7.1.3. Managerial Characteristics and the Strategy Process

The strategy process is ultimately executed by managers and the cognitive abilities of the manager themselves are likely to dictate their **decisions and actions**. This research is pertinently based on strategy process theory which indicates a managerial level as contributing factor to strategy formation. The characteristics of individual managerial level can be measured in a number of different constructs. This study focuses the decisions and actions of individual managers, whether either to go for a proper plan or to be

improvisational in their strategic activities; and in some way provides insight into the broader cognitive process involved in the formation of managerial decisions and actions. Therefore, two perspective of cognitive abilities are used in this study -- **a dual system theory of reasoning** (intuitive *vs.* rational) which supports the decision making process; and **a social cognitive theory** that attempts to explain the actions of the managers. Strategy process theory does indeed prescribe these as important elements of decision-making reflective in such characteristics as rationality, reliance on past experience, attitude towards risk and uncertain decisions (*e.g.*, Simon, 1945; March and Simon, 1958; Cyert and March, 1963; Weick, 1998; Mintzberg and Lampel, 1999; Cummings and Wilson, 2003).

Many recent descriptive decision-making models have explicitly used a dual system theory of reasoning (Sloman, 1996; Leaptrott, 2005). Different terms have been used to describe these two systems. These two systems -- experiential versus rationality can operate in parallel (integration between both systems) (Eipstein, 1994; Eipstein *et al.*, 1996) but each system delineate different cognitive reasoning / judgments by which enable to influence diverse set of decisions and settings. Experiential system describes “the fast, effortless, intuitive process that is subject to emotional influences and is utilised to make many decisions in near simultaneous manner; whereas rational system explains a slow, effortful, rational process that results in decisions that are made sequentially rather than simultaneously due to the cognitive limitations of the decision-maker” (Leaptrott, 2006:19).

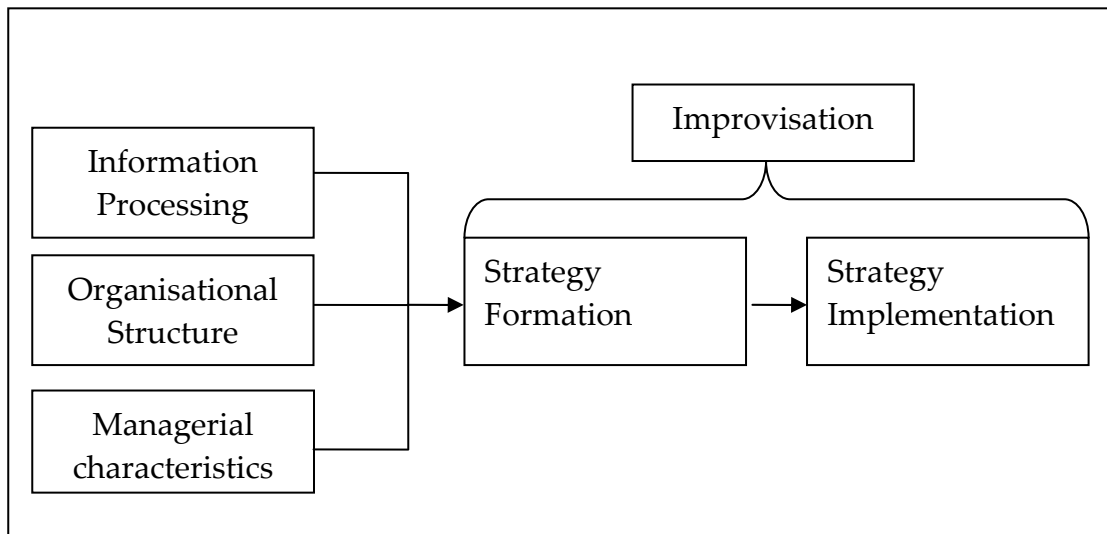
When viewed from the perspective of social cognitive theory, previous researches (*e.g.* Bandura, 1997; Kirk *et al.*, 2006) always associate self-efficacy/confidence and risk taking behaviour. Social cognitive theory explicates that individuals hold self-beliefs which enable them to apply some

control over their thoughts, feelings, and actions (Bandura, 1986). This human thought, behaviour and actions are influenced by social system and environment through psychological mechanisms of the self system (*e.g.* self-efficacy and risk taking influences) (Bandura, 1986). The influence of self-efficacy and risk taking characteristics are significantly important in explaining the managerial actions in strategy formation process. For instance, elements of the improvisation literature indicate that where managers have greater self-confidence in their abilities and judgments, they are likely to move away from formalised planning and improvise when necessary (Kanter, 2002; Hmieleski and Corbett, 2008). Similarly, risk averse managers are unlikely to deviate away from corporate protocols and hence stick to a rigid planning system which protects and entrenches their position (Barret, 1998). Risk aware managers and those willing to take risks on the other hand are often likely to be amenable to improvisation (Chelmsinski, 2007). However, manager's expertise that depend on innate cognitive abilities (Amabile, 1996; Amabile, 2001; Vera and Crossan, 2004) cannot be excluded in this theory as it reinforces the thought processes of the managers to be more self-confidence and daring towards risk.

Understanding managerial reasoning and decisions be they either quickly and intuitively or rational according to the appropriate information search is important because the accuracy of these decisions (*e.g.* through either planning or improvisation) by the managers might affect firm performance and survival (Leaptrott, 2006). Besides understanding the action and reaction of the managers which influenced by the interrelationship between thought processes, personal factors, behaviour and environments imperative as it can explain the capabilities of the managers (high self-confident) to prudently act in producing given achievement particularly firm's strategic goals.

The managerial implications of reasoning and confidence surround identifying personnel capable and best suited towards improvising and so also any recruitment and selection policies. Being able to identify the 'right' people for what the organisation is trying to achieve and how it is seeking to achieve it (*e.g.* through improvisation) is important as bringing in people with characteristics incompatible with improvising may lead to stress and breakdown in organisational behaviour and possible lower incidences of improvising. At the extreme, bringing in people, or placing current employees, in decision-making positions that are not accustomed to improvisational behaviour or tolerant of it could have a very negative impact on the effectiveness of decisions as well as the managerial culture of the firm. The growth of the fields of cognitive and workplace psychology are testament to this.

Regardless of the number of possible characteristics of a manager, and the cultural dispositions surrounding them, it would appear logical that the executors of the strategy process are affected in some way by their own personality and characteristics. In relation to the strategy process, such contentions are supported by Mintzberg and Lampel (1999) and Cummings and Wilson (2003) and certainly with respect to improvisation this is clear from the work of Weick (1998). Thus, there are interesting linkages between information, structure, managerial characteristics and improvisation that need further examination with respect to developing and motivating improvisation to occur. As such, the view of strategy as a process affected by multiple antecedents is justified. These linkages can be seen in Figure 2-2. However, much theory on strategy is also clear that any performance effect by improvisation is likely to be affected by multiple contingencies. Therefore, a discussion of contingency theory follows next.

FIGURE 2-2:IMPROVISATION AND STRATEGY AS PROCESS THEORY

2.7.2. Contingency Theory

Extant literatures demonstrate that organisational improvisation is influenced by many internal and external constraints from the organisation and its subsystems (Moorman and Miner, 1998b; Akgun and Lynn, 2002; Cunha and Cunha, 2002). However, there is very limited empirical evidence that demonstrates the significance of *which* internal and external factors affect organisational improvisation. For example, do external factors such as technological, market and competitive turbulence produce an effect on the process of organisational improvisation and firm performance? These questions remain equivocal. Managers have to make an on-going effort to fine-tune what are the absolute factors that could best represent strategic factors that contribute towards leading an organisation to improvise and improve performance. However, there is no universal set of strategies or influential factors which are fine for all businesses (Donaldson, 2001), that is, firms act within multiple different contingencies and all of which can have variable impacts on the firm at a given time.

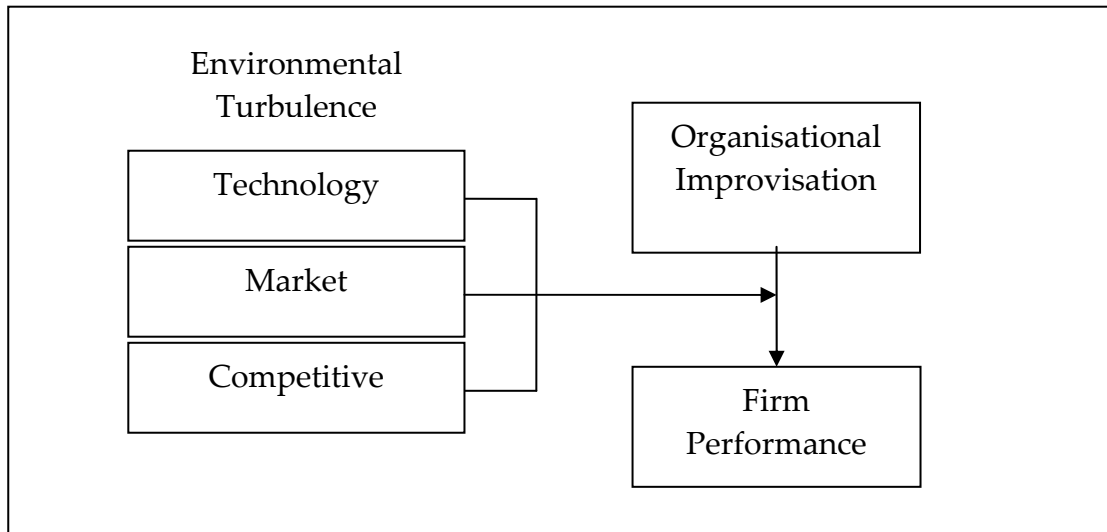
Contingency theory (also called situational theory) is classified under behavioural theory. Contingency theory has been widely accepted and used in many empirical studies in the field of strategic management (e.g. Hambrick and Lei, 1985; Buzzell and Gale, 1987; Gardner *et al.*, 2000) and many other disciplines for which focus on the relationships among environment, strategy, organisational structure and performance is made (Calantone *et al.*, 2003). The contingency approach to management is based on the idea that there is no one best way to manage and organise the organisation, to lead a company, or to make decisions. It is assumed that there is no universal answer to such questions due to the changes of situations, people and organisations' structure overtime (Donaldson, 2001). Organisational leadership, management and decision making style, for example, are effective in some situations, but might be ineffective in other situations. This indicates that the effectiveness of leadership and managerial decision making are contingent upon the demands imposed by the situation, which depends upon various internal and external forces.

Some internal contingencies are demographic or reflect the personal characteristics of the leader (*e.g.* attitude towards risk, self efficacy level), strategy and structural contingencies, organisational resources and operational activities (Donaldson, 2001). External contingencies on the other hand are typically environmental contingencies that are based upon the political, economic, technology, market and social cultural forces that affect the firm, and also aspects of competitive position and other industrial demands (Donaldson, 2001). In addition to these examples, other contingencies can also include organisational size (Child, 1975) and organisational strategy (Chandler, 1987). Under conditions of contingency theory, the organisation needs to address the issue of strategic fit or in other

words, how it can best manage its internal and external conditions through the actions it takes and strategies it adopts. Organisations, then, seek to attain fit by taking strategic actions that fit the contingencies the firm faces as the fit of organisational characteristics to contingencies leads to higher performance (Donaldson, 2001). Thus, it illustrates that contingency theory contains the concept of a fit that affects performance, which in turn impels adaptive organisational change (Donaldson, 2001). To achieve such fit could involve the act of improvisation as formalised planning tends to be too slow to react and adapt actions fast enough to address changing environmental conditions (be they internal or external).

Donaldson (2001) states that numerous prior research studies have examined the effect of fit on performance (*e.g.* Gresov, 1989; Hamilton and Shergill, 1992; Jennings and Seaman, 1994; Keller, 1994; Ruekert *et al.*, 1994) as well as the effect of contingencies on some aspects of the organisation (Govindarajan, 1988; Kohli, 1989; Birkinshaw, 1999). Donaldson (2001) also points out that in the contingency theory of organisations; a contingency is any variable (as a moderator) that moderates the effect of an organisational characteristic/trait/activity/process on organisational performance.

This study seeks to explore what are the external contingencies (such as environmental turbulence: technology, market, and competitive) that affect the relationship between firm improvisation and performance (as can be seen in Figure 2-3). That is, improvisation is assumed in the literature to have some performance effect, but, contingency theory notes that this relationship should not be examined in isolation but in light of multiple contingencies that affect this relationship. Thus, contingency theory is relied upon in developing this aspect of the research model.

FIGURE 2-3:IMPROVISATION AND CONTINGENCY THEORY

It is important to note that internal contingencies should not be assessed as part of the contingency aspect of the model. Hax (1990) identifies processes contributing to strategy formation are 1) cognition of individuals in which understanding of the environment of strategy and 2) organisational processes by which perceptions are channelled and commitment developed. This indicates that the 'strategy as process' theory is relied upon to explain the antecedent factors behind the strategy formation aspect of organisational improvisation and this theory clearly states that antecedent factors that underpin strategy formation, or in other words the factors that motivate strategy formation to occur (be it improvised or planned), are 1) cognition of individual (*e.g.* the dual reasoning and social cognitive of the managers that execute the decisions and actions of strategy formation) and 2) internal organisational structure issues and information (within the confines or bounded rationality)(refer to Figure 2-2). Thus, internal factors are to be examined in the model as antecedent factors and not as contingencies later in the model as this would contradict 'strategy as process' theory. The next

section will discuss thoroughly the research gaps on the internal and external factors that relate to improvisation.

2.8. Identification of Research Gap

The first research gap pertains to the antecedent factors that drive organisational improvisation to occur, specifically from the strategic management perspective. There is however a second research gap that requires addressing. Little is known or confirmed in the literature on the performance impact of organisational improvisation. Does improvising lead to superior performance? Are there specific conditions under which this will or will not occur? There is little empirical research and evidence on this matter. As an act of strategy formation, one would expect improvisation to have some effect on performance but this could then be affected by multiple possible factors (such as demand, economic conditions etc). Given the lack of (a) theoretical research on this topic; (b) lack of empirical evidence; and (c) general lack of consensus on whether improvising is positive for improving organisational performance, this represents a significant research gap which this research intends to address.

2.8.1. Antecedent factors that affect Improvisation

Some scholars suggest the antecedent factors of organisational improvisation are related to theatre performance (Vera and Crossan, *et al.*, 2005) or jazz metaphors (Hatch, 1997; Barret, 1998; Cunha *et al.*, 1999; John *et al.*, 2006). From improvisational theatre, actors do not know when there will be real time actions that they have to spontaneously respond to (*e.g.* accidents, missed lines, improvisations by fellow actors), though they know that they need to improvise during the role play (Vera and Crossan, 2005). However expert and experienced actors make improvisation seem easy due to the vast

skills and knowledge they have (Vera and Crossan, 2005). By looking at this from an organisational perspective, this approach can be analogised as the skills or expertise of managers that are important for organisational improvisation to arise. There is limited empirical research study on the link between expertise and improvisation despite the normative assumptions made from the theatre that expertise is important. As managerial characteristics may drive the organisation to improvise, this expertise element needs to be considered in identifying the antecedents of improvisation.

With regards to jazz improvisation, Kamoche *et al.* (2003) have proposed the antecedents of jazz improvisation can be divided into two groups: the *motivation* to improvise and the *potential* to do so. The motivation to improvise appears from a deliberate choice of improvisation, a culture that encourages experimentation and treats mistakes as learning opportunities (Crossan *et al.*, 1996, Weick, 1998; Kamoche *et al.*, 2003). Whereas the potential to improvise derives from a minimal structure that reflects knowledge of musical norms and jazz standards, a social structure based on implicit norms and the use of a song to drive task performance (Bastien and Hostager, 1991; Hatch, 1997; Barret, 1998; Kamoche *et al.*, 2003). In their study, Kamoche *et al.*, (2003) stress that minimal [organisational] structure is a crucial element and it can be categorised into three components: social structure, technical structure and jazz standard. From these components, there are some elements such as high confidence, risk taking attitudes, autonomous style, behavioural norms, communicative codes, and so forth (*see* Table 2-3) that need to be considered by jazz musicians since it can serve as potential for improvisation (Kamoche *et al.*, 2003). These structure elements relate to the way in which people in groups behave and interact; and it also can be deemed on the individual characteristics that drive improvisation. By looking through organisational

improvisation, it is believed that the personal characteristics of managers in organisations could also be a significant element of organisational improvisation. A lack of empirical research has evidently examined such elements of individual characteristics. High risk taking (Chelminski, 2007) and high self-confidence (Leybourne and Sadler-Smith, 2006) of managers, for example, are elements that gain attention in this study amongst others but the literature in general has been silent on these characteristics and how they affect improvisation, relying instead on simply abstracting from jazz and theatre.

Reviewing on other literature related to organisational improvisation, Cunha *et al.*, (1999) have proposed three elements that can be a central condition for improvisation. A minimal structure, experimental culture and low procedural memory are the antecedents that can drive organisational improvisation (Cunha *et al.*, 1999). For a minimal structure, three elements involving control mechanism, milestone or action deadlines and a clear articulated goal need to be well planned by the organisation for the condition of improvisation to occur (Cunha *et al.*, 1999). In addition, Cunha *et al.* (1999) also propose six factors that can influence the quality of improvisation. These factors consist of leadership, member characteristics, information flow, memory, organisational configuration and resources (Cunha *et al.*, 1999). These influencing factors cannot be assumed to provide a positive outcome since in some cases they can hinder performance (Cunha *et al.*, 1999). However, the assertions by Cunha *et al.* (1999) are only made in the development of a theoretical and conceptual understanding of organisational improvisation. Empirical evidence needs to be generated and examined for these possible factors in driving improvisation to be confirmed.

According to Moorman and Miner (1998b), they investigate three antecedents of improvisation in a team-based context. Memory, as suggested by Cunha *et al.* (1999), and also environmental turbulence and real-time information flow are possible antecedents of improvisation (Moorman and Miner, 1998b). From this empirical study, the results show that organisational memory level decreases and environmental turbulence level increases the incidence of improvisation, but no significant effect was found on the relationship between information processing and improvisation (Moorman and Miner, 1998b). Akgun and Lynn (2002) have then extended Moorman and Miner's (1998b) team improvisation model by adding more variables and clustered into three groups which are related to goals, teaming and information sharing factors. This study reveals that team improvisation has a positive impact on speed-to-market under market and technological turbulent. They also found that team stability and teamwork have a positive significant relationship with improvisation (Akgun and Lynn, 2002). However, other antecedent factors like goal stability, team experience, management support and daily reviews have found not to be significant association to improvisation (Akgun and Lynn, 2002). Both studies (Moorman and Miner, 1998b and Akgun and Lynn, 2002) focus on teams and the investigation of antecedent factors of improvisation are still in infancy stage when looking at *organisational* improvisation. Therefore more extension and consideration on the antecedents of improvisation is required, specifically by studying the organisational aspects (Moorman and Miner, 1998b).

Chelminski (2007) discussed further possible organisational characteristics that provide conditions for improvisation to occur and these encompass a favourable organisational attitude towards taking risk and a conducive organisational structure reflecting low formalisation, effective

intra-organisational communications and decentralised organisational structure. However, these dimensions are still circumstantial at present and not supported by empirical data. For example, antecedents such as low formalisation and decentralised structure as being characteristics of a minimal structure, and attitude towards risk (either derived from managerial or organisational aspects) are becoming recognised increasingly as important antecedents that drive improvisation, but such assertions are mostly theoretical. No empirical study has found evidence to prove the link between risk taking and improvisation; and only one empirical study by Souchon and Hughes (2007) has revealed the positive significant association between organisational structure and export improvisation. Due to this limited evidence, therefore, it can be positive in this study to examine the link between these elements (risk taking and minimal structure) and organisational improvisation. Further, Slevin and Covin (1997) assert that organisational structure, specifically organic/minimal structure also relates to organisational flexibility and adaptability. This means that firms need to be more flexible when they want to improvise. It can be an empirical feature of improvisation (Scribner, 1984) and clearly requires examination. Due to an absence of evidence on the link between organisational flexibility and improvisation, it is important for this study to investigate this relationship in greater detail.

With regards to Souchon and Hughes's (2007) study on export improvisation, their research model identified ten antecedents of improvisation (*see* Table 2-3). The results of their study demonstrate that export formalisation, coordination, memory, innovativeness, marketing planning and organisational structure has a positive significant association to export improvisation. However a negative association between adaptability

and improvisation was shown in their study; and three antecedent factors of export experience, export information overload and environmental turbulence were not found to be significantly associated to export improvisation. This study is the first empirical research to address antecedents of export improvisation. The antecedent factors of export improvisation maybe or may not be similar to the improvisational process from strategic management perspective. Therefore, the identification of antecedents of improvisation from strategic management is pertinent and crucial to closing the research/theoretical as well as managerial gaps. A socio cognitive approach, for example is one of the elements that could be considered to have a significant link on improvisational activity (Leybourne and Sadler-Smith, 2006; Souchon and Hughes, 2007).

Concerning on the element of socio cognitive, Leybourne and Sadler-Smith (2006) have proposed that improvisation can be hugely related to some association between cognitive judgment and improvisation. Leybourne and Sadler-Smith (2006) state that an antecedent of improvisation is *“very likely to be those affectively charged, non-conscious cognitively based judgments which they refer to as intuition, hunch or gut feel”* (p.491). This reasoning process conceivably imply on the incidence of organisational improvisation. Previous studies suggest the reasoning process (refers to intuitive reasoning) and improvisation have significant relationship (Truman, 1996; Burke and Miller, 1999; Leaptrott, 2006). However, this hypothesis has only been empirical proven by Leybourne and Sadler-Smith (2006). In their study, the results demonstrate that there is a positive relationship between intuitive judgments and improvisation (Leybourne and Sadler-Smith, 2006). But, if the organisation chooses improvisation as a deliberate process, then rational reasoning might provide some effect on improvisational process. This notion

of either intuitive or rational reasoning in organisational improvisation, however, is understudied. Therefore, research on the dual process of reasoning (either intuitive or rational) within the cognitive ability of the managers as a primary antecedent of improvisation should be examined in greater detailed.

Other relevant factors such as the influenced factors associated with improvisation are also important to determine the effectiveness of organisational improvisation. Vera and Crossan (2005) suggest that there are two elements – descriptive and prescriptive – that need to be measured as elements of improvisation. The descriptive elements have previously been discussed in prior section (*see* Section 2.2). Meanwhile, the prescriptive elements comprise of expertise, teamwork quality, experimental culture, real-time information and communication, and memory (Vera and Crossan, 2005). The clarification of descriptive elements (spontaneity and creativity) and prescriptive elements of improvisation is essentially needed in helping to explain misconception between the roles of improvisation in organisation and the detection factors associated with effectiveness of improvisation (Vera and Crossan, 2005). In Souchon and Hughes's (2007) study, they suggest two factors (interfunctional coordination and export experience) moderate the export improvisation-performance link. The result of their study revealed that the effectiveness of export improvisation is only moderated by interfunctional coordination, and no significant moderating effect is found for export experience was found in the relationship between export improvisation and performance. The non-significant moderating effect of export experience might possibly because by it not being a moderator but an antecedent. An argument can be made that experience enables fast decision-making but reference to memory and past actions that have worked previously. As such, a

manager could rely on experience to improvise. If we examine the improvisation–performance relationship, we suggest that performance increases as the incidences of improvisation increase. Whilst more experience could lead to better improvisation and so better performance (a moderating relationship) the converse could be true. For example, relying on experience and repeating past actions certainly allows for spontaneity and immediate action but the decisions may not be creative and indeed may not be the most appropriate for the situation (cf. Hambrick *et al.*, 1993; Geletkanycz, 1997; Geletkanycz and Black, 2001). This would then mean that improvisation would have deteriorated performance. On its own however, experience may not moderate the relation but simply be a driver for improvisation to happen. Whether that improvisation was suitable or appropriate is what will determine performance levels and experience could provide for both suitable and unsuitable improvisations to occur. It is likely then that this why a non-significant moderating relationship was found and why an antecedent relationship needs to be examined.

By looking at previous research, the study on organisational improvisation, specifically on the antecedents of improvisation, it can be said that this study is still in infancy stage (*please refer* Table 2-3 for the summary of previous studies on the related factors that drive improvisation). The gaps and weaknesses of previous studies can be the opportunity for the researcher to close the hole and demonstrates the significant contribution to theories as well as practitioners. For example, the examination on memory and information flow from previous studies have shown dubious results (*see* Moorman and Miner, 1998b; Vera and Crossan, 2005; Souchon and Hughes, 2007) and this is perhaps due to different contexts and settings. This research is specifically focused on the strategic management perspective and the

'strategy as process' theory notes that information processing needs to be separated with the aspect of organisational structures and characteristics. The relevant construct of information processing can be organisational information and memory.

TABLE 2-3: ANTECEDENT FACTORS OF ORGANISATIONAL IMPROVISATION

Authors	Antecedent Factors of Organisational Improvisation
Scribner (1984)	flexibility
Moorman and Miner (1998b)	memory, information flow, environmental turbulence Proposed factors for future research: individual and organisational characteristics
Cunha <i>et al.</i> (1999)	minimal structure, experimental culture and a low procedural memory minimal structure : mechanism; milestone or action deadlines; clear articulated goal
Akgun and Lynn (2002)	goals, teaming and information sharing factors <i>Goals:</i> Goal clarity; goal stability <i>Teaming:</i> Team stability; teamwork; team experience; management support <i>Information sharing:</i> daily reviews
Kamoche and Cunha (2003)	motivation to improvise and potential to improvise Potential to improvise: minimal structure <i>Minimal structure:</i> social structure; technical structure; jazz standard. <i>Social structure:</i> behavioural norms; communicative codes; partnering in an autonomous ensemble; soloing/comping, high trust (confident); risk-taking attitudes; supportive culture <i>Technical structure:</i> definition of key; chord progression and repertoire; template of a song; chorus of riff; wide stock of talent; knowledge of music technology and instrument
Vera and Crossan (2005)	expertise, teamwork quality, experimental culture, real-time information and communication, and memory
Leybourne and Sadler-Smith (2006)	intuitive reasoning; experience; expertise of the managers Proposed factors for future research: rational reasoning; manager self confidence
Souchon and Hughes (2007)	formalisation; adaptability; interfunctional coordination; experience; information overload; memory; planning; innovativeness; organic structure; environmental turbulence
Chelminski (2007)	attitude towards taking risk; low formalisation; effective intra-organisational communications; decentralised organisational structure; motivation to improvise

Based on extant literatures, different contexts and settings were investigated in previous studies when examining the factors that drive improvisation. Most previous studies on improvisation focus on team members (*e.g.* studies by Moorman and Miner, 1998b; Akgun and Lynn, 2002; Vera and Crossan, 2005) and extant research fails to explain how managers and the whole organisation behave within the highly uncertain, novel and turbulent environments in which they often operate. Some scholars have noted that organisational improvisation is a collective process that includes improvisation by individuals, groups, departments or whole organisations (Cunha *et al.*, 1999; Moorman and Miner, 1998b). For that reason, it is essential to investigate how top level managers can encourage organisational improvisation to occur as these managers no doubt have the power to influence whether improvisation is allowed or frowned upon, and thus, resisted. The cognitive ability of the managers (Crossan and Sorrenti, 1997; Leybourne and Sadler-Smith, 2006, Souchon and Hughes, 2007), managers' characteristics such as skills and expertise (Cunha *et al.*, 1999; Moorman and Miner, 1998b) and organisational structure and information processing (Moorman and Miner, 1998b; Cunha *et al.*, 1999) can be the antecedent factors that drive organisational improvisation according to the research and theory examined thus far and as such require examination here in this study.

2.8.2. Organisational Improvisation and Firm Performance

Firm (organisational) performance has long been the principal dependent variable in strategic management research (Gilley *et al.*, 2002). Researchers frequently consider organisational performance when investigating such organisational phenomena as structure, strategy and planning (Ottesen and Grønhaug, 2004). Undeniably, a primary investigation of strategy research is that it tries to examine the relationship between various

organisational characteristics and performance and survival (Meyer, 1991; Gilley *et al.*, 2002). Previous research have studied and linked variables such as strategic planning and strategic making process (Rogers *et al.*, 1999; Brews and Hunt, 1999; Slotegraaf *et al.*, 2004), business-level or corporate-level strategy (Porter, 1980; Miller, 1988; Liao, 2005), organisational structure and capabilities (Burns & Stalker, 1961; Miller, 1988; O'Regan and Ghobadian, 2004), and choice of environmental domains (Bourgeois, 1985; Miller, 1992; Garg *et al.*, 2003) to various performance measures. To date, the study of the improvisation and organisational performance relationship is still scarce and as yet, there is no empirical research evident that reveals whether this is a significant relationship. This emphasises the need to develop a model which is specifically based upon an empirical investigation of this relationship (improvisation-performance link).

During theoretical and conceptual development, researchers tend to study the organisational improvisational outcome in a more implicit manner based on jazz improvisation (*see* Eisenhardt and Tabrizi (1995); Barret, 1998; Crossan and Sorrenti, 1997; Cunha *et al.*, 1999; Hatch, 1999; Weick, 1999). Organisational improvisation tends to produce positive and negative outcomes in current research (Cunha *et al.*, 1999). For example, previous research on jazz improvisation suggests the positive outcomes include flexibility, learning, a personal feeling of transcendence, and an increasing motivation to improvise (Eisenhardt and Tabrizi, 1997; Crossan and Sorrenti, 1997; Barret, 1998; Cunha *et al.*, 1999; Weick, 1999). Flexibility is the most attractive outcome and this concept is close to adaptation (Cunha *et al.*, 1999). Whereas, the negative outcome are biased learning; opportunity traps; amplification of emergent actions; over-reliance on improvisation; and increased anxiety (Cunha *et al.*, 1999).

There is then a lack of empirical studies that directly examine the organisational improvisation and firm outcome relation. For example, Moorman and Miner (1998b), Akgun and Lynn (2002) and Vera and Crossan (2005) use new product development; Leybourne and Sadler-Smith (2006) investigate project outcomes which relates to external and internal outcome; Souchon and Hughes (2007) focus on export performance as an outcome of export improvisation; while Hmieleski and Corbett (2008) study the link between entrepreneurial improvisational behaviour and venture performance. According to Leybourne (2006) improvisation can create internal and external outcome. Internal outcomes are more likely to be amenable to rational analysis where it is more related to time, scope and cost (*e.g.* resource allocation, return on investment, risk exposure); whilst the external outcomes are related to customers such as customer satisfaction and so forth. In general, equivocal results have appeared from previous studies on the direct link between improvisation and various outcomes (*see* Vera and Crossan, 2005; Hmieleski and Corbett, 2008). No study has provided clear evidence of the association between organisational improvisation and firm performance as a whole. But, much previous researchers tend to assume that improvisation may lead to superior performance through the secondary benefits of contingent factors such as flexibility (Crossan *et al.*, 2005), self efficacy (Hmieleski and Corbett, 2008), and management of environmental turbulence.

Nonetheless, referring to jazz improvisation, the musicians perform in fluctuating situations and this scenario is reflected in an organisational setting, where most businesses perform in turbulent environments (Crossan *et al.*, 1996; Moorman and Miner, 1998b; Akgun and Lynn, 2002). It is assumed that the more unpredictable or turbulent the environment is perceived to be, the more the organisation needs to be improvise, and the higher the likely impact

on performance (although this remains as yet unproven). Therefore, the environmental turbulence could be the best condition to investigate as having a possible significant contingent effect on the improvisation-performance link.

Recently, environmental turbulence has increasingly received greater attention in the improvisation literature. Few scholars have found that environmental turbulence can give a significant moderating effect on improvisational activities within the organisation (Moorman and Miner, 1998b; Akgun and Lynn, 2002; Cunha *et al.*, 2003; Cunha and Cunha, 2005; Vera and Crossan, 2005). For instance, the study by Akgun and Lynn (2002) revealed that for turbulent markets and technologies, improvisation is positively associated with speed-to-market. While, Cunha and Cunha (2006) assert that in order to examine the link between improvisation and performance, it is assumed that competitive turbulence is the important component which moderates those factors. This is significant in developing a strategic improvisational mode; where organizations should move quickly to explore an unexpected opportunity or to neutralize a disturbing threat (Cunha and Cunha, 2006a) in achieving business performance. Therefore, it can illustrate that changing customer preferences, exponential technological developments, increase in competitive demand and readily available information from markets and technologies can force organisations to enhance the association between strategic improvisational activities and performance outcome in a speedy pace (Akgun and Lynn, 2002, Cunha and Cunha, 2006b).

These external environmental factors include technological, market and competitive factors derived from factors outside the organisation which perhaps could gain a direct or indirect effect on improvisation-firm performance link is understudied, especially from the perspective of strategic

management. This relationship remains uncertain because lack empirical discovers environmental turbulence as a moderating effect on improvisation-outcome relationships, specifically in organisational performance as a whole. Hence, this study is essentially important to investigate the significant moderating effect of technological, market and competitive turbulence on organisational improvisation-performance link.

2.9. Concluding Remarks

This chapter reviewed various extant literatures on organisational improvisation. Firstly, the literatures covered the meaning that is used to develop the improvisation construct. Then it discussed the concept of organisational improvisation from the strategic management perspective and the underpinning theories of this study; which is to go beyond the currently dominant jazz metaphor in theory development. Following this, the antecedent factors of organisational improvisation and the improvisation-performance link were reviewed. It is important to note that the antecedent factors of improvisation were bonded from the 'strategy as process' theory; whilst external environmental turbulence is underpinned by the contingency theory perspective. The antecedents of improvisation should also be noted that to characterise those factors reflecting managerial (*e.g.* reasoning factors and managerial characteristics) and organisational (organisational structure and information processing) aspects, as strategy process theory indicates. The next chapter will discuss in greater depth the research model each element that is contained within this research model.

Chapter 3

Research Hypotheses

3.1. Introduction

Chapter 2 provided a literature review, which presented an overview of improvisation, improvisation in strategic management, theoretical underpinnings and identified weaknesses and deficiencies in existing research on the factors that affect improvisation. This chapter continues the development of the research model of this study, consequently further analyses of extant literatures is undertaken in an effort to hypothesise the factors that may affect organisational improvisation and in turn the improvisation–performance relationship.

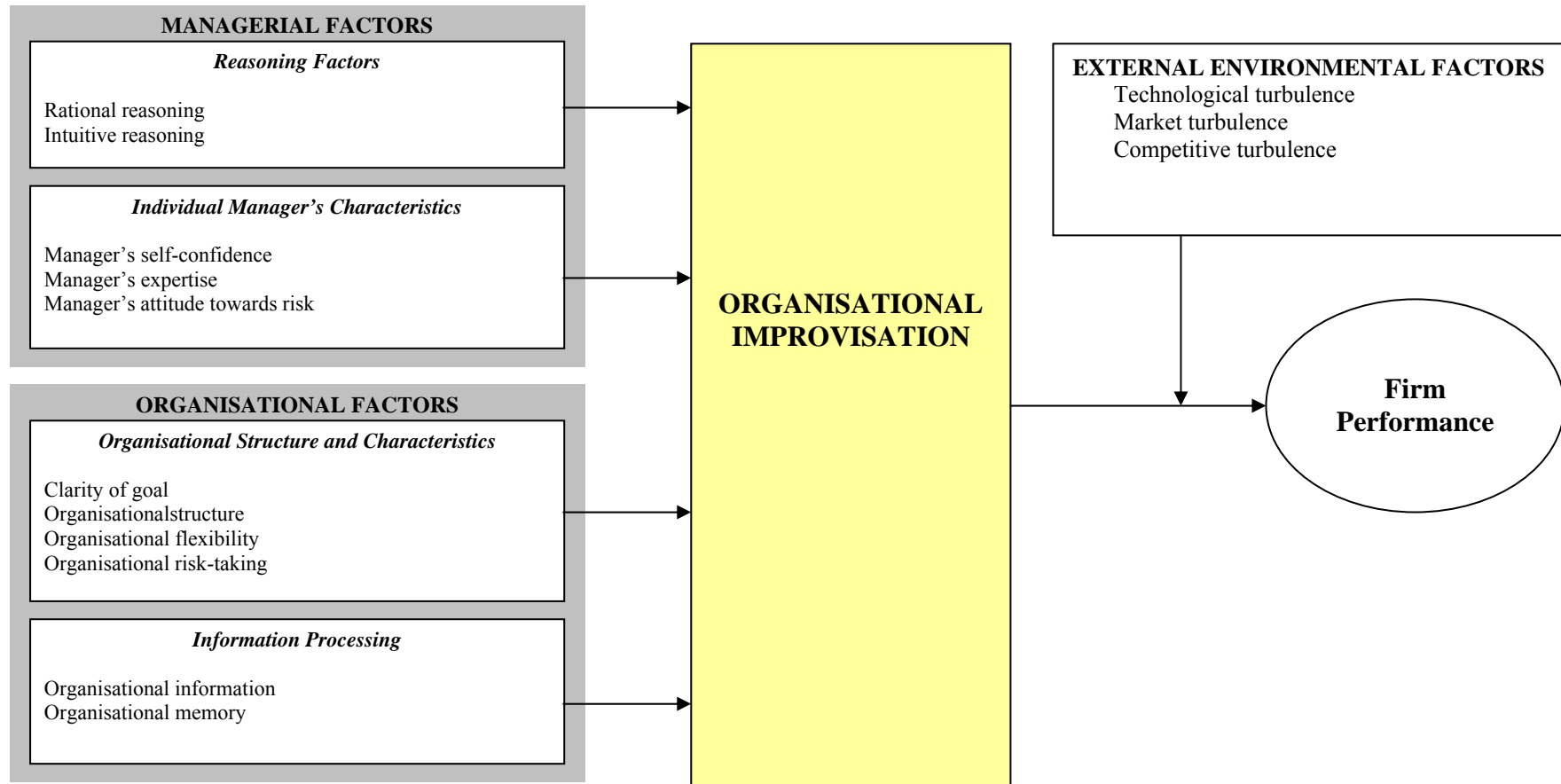
3.2. Research Model

This study examines two categories of factors which are noted as foundational factors of improvisation, following strategy process theory. The first factor to examine is the managerial factors, which are inclusive of the reasoning behaviour of the manager and managerial individual factors (such as self-confidence, expertise and risk attitude); and secondly, organisational factors such as organisational structure and information processing). It is speculated that individual level (*e.g.* manager’s reasoning, manager’s self-confidence, manager’s attitude towards risk) is an important characteristic in being willing to improvise. If, then, a top management team consists of self-confident managers then the likelihood that they as strategic decision-makers will improvise increases greatly and so organisational improvisation may well then takeover from formal strategic planning. The same rationale applies to

all of the individual managerial characteristics hypothesised. Put simply, whilst organisational (*e.g.* goals, structural, flexibility, etc.) conditions may be present for organisational improvisation to happen, this may not be enough if the managers themselves adverse to improvisation due to their own characteristics. Thus, it would appear logical and important to examine both conditions (organisational and individual). So, this research is potentially having a situation where an organisational-level activity is affected in some way by individual levels factors, that, when taken together and examined across a top management team can explain why organisational improvisation occurs or not.

The second part of the research model refers to the investigation of the improvisation–performance relationship under a contingency basis, whereby external environmental factors will be considered to act as having a moderating effect on this relationship. Based on a review of various extant literatures on improvisation and the identification of past research gaps, the conceptual model is now presented in Figure 3-1.

FIGURE 3-1: CONCEPTUAL MODEL ON THE RELATIONSHIP BETWEEN INTERNAL AND EXTERNAL FACTORS, ORGANISATIONAL IMPROVISATION AND FIRM PERFORMANCE



3.3. Development of Research Hypotheses

This section continues with an in-depth analysis of the literatures related with each factor and which will be used to develop the research hypotheses of this study. This section starts with in-depth examination of managerial factors and then followed by organisational factors. Subsequent to this, an examination of the performance impact of organisational improvisation is undertaken and consideration is given to external environmental turbulence as a moderator to this relationship.

3.3.1. Managerial Factors

Improvisation is increasingly valued by top executives nowadays because most managers notice that it is a valuable tool which enables their companies to be more nimble, flexible and responsive (Vera and Rogriguez-Lopez, 2007). However, most previous research studies on improvisation are conducted within the domain of project management teams (*e.g.* Moorman and Miner, 1998b; Vera and Crossan, 2005; Crossan *et al.*, 2005; Akgun *et al.*, 2002, 2005). Therefore, Moorman and Miner (1998b) suggest that it is vital to investigate the role of individual improvisation in organisations and in particular, how top level managers deal with organisational improvisation. Cunha *et al.* (2002), in their conceptual research, note that effective firm improvisation is entrenched within leadership style. They state that the leadership style may either impede or provide some positive impact on the quality of organisational improvisation. For example, authors drawing from the jazz metaphor argue that a 'servant', 'rotating' or 'directive' leadership style by managers could influence the effectiveness of firm improvisation (Cunha *et al.*, 2002). Ultimately, organisations improvise through the actions of employees and managers and so if individual managers improvise and this

spreads it is likely that an organisational improvisation capability will develop.

Cunha *et al.* (2002), in their conceptual research, note that effective firm improvisation is entrenched within leadership style. They state that the leadership style may either impede or provide some positive impact on the quality of organisational improvisation. For example, authors drawing from the jazz metaphor argue that a 'servant', 'rotating' or 'directive' leadership style by managers could influence the effectiveness of firm improvisation (Cunha *et al.*, 2002). From this we can derive that managers, and their characteristics, have the potential to influence improvisational behaviour and whether or not such improvisation will occur. In this case, such knowledge gaps needs to be filled in examining whether individual managerial factors play a key role in affecting organisational improvisation.

In this study, two managerial factors are chosen based on the gaps found in previous literatures such as Moorman and Miner (1998b), Crossan *et al.* (2005), Vera and Crossan (2005), Leybourne and Sadler-Smith (2006) and Akgun *et al.*, (2006) and so forth (please refer to Chapter 2, Section 2.3). The two factors are reasoning factors (either intuitive or rational) which focus on the cognitive ability of the managers; and the other factor surrounds the managers' own characteristics (*e.g.* manager's self confidence, managerial expertise and attitude towards risk).

3.3.1.1. Reasoning Factors

Reasoning is in the mind of individual managers and it is by nature a high level thought process. The way we think might affect the way we decide or act and simultaneously generate the behaviour of individuals, the actions of people, and consequently, the execution of those actions. In organisations,

the manager has to wisely reason and deliberate on the choices of strategic decisions and make the 'right' decisions. Management authors have concluded that much of the reasoning and decision making of senior management particularly at the executive level is intuitive (gradually being accepted in America as a managerial tool used particularly at senior management level) and rarely rational and logical (Truman, 1996). Burke and Miller (1999) demonstrate that 90% of the managers they examined used intuitive decision making to speed up practices if quick action is required in complex business scenarios. Meanwhile, Aram and Walochik (1996) demonstrate from a case study of Spanish managers that they generally like to make informal and spontaneous decisions and they believe that "*...things turn out well when they are not planned*" (Aram and Walochik, 1996:73). This of course reflects an improvisational nature to their behaviour.

Informal or spontaneous decision making, or the intuitive ability of managers in decision making, is not an easy act to implement. The experience and expertise of the managers with appropriate information could help managers in easing decision making. Therefore, in some cases, some studies suggest that the intuitive ability is based on the levels of expertise and experience of the managers (Crossan and Sorrenti, 1997). However, some scholars assert that intuitive reasoning lies outside the bounds of experience and information as time factors do not permit full analysis of the situation relative to (a) past experiences or (b) information (Crossan and Sorrenti, 1997). That is, the time demand to make an instant decision negates the possibility of analysis in favour of relying on intuition. For example, Leybourne and Sadler-Smith (2006) contend that the relationship with improvisation is explicable in terms of the extent to which managers are drawing upon unconscious expertise and tacit knowledge.

According to Leybourne and Sadler-Smith (2006), intuition is positively related to the extent to which managers feel that they engage with meeting customers' requirements and satisfaction needs. This means that, *"...the relationship with customer satisfaction is perhaps explicable in terms of the role of feelings and emotions of the managers. Managers who are amenable to the influence of their feelings and emotions in their behaviours may also be sensitive to the needs, wants and feeling of customers. They may therefore be more prepared to expend additional effort in order to meet customer expectations than are managers who are less sensitive to intuition and who may be more towards rational judgment"* (Leybourne and Sadler-Smith, 2006:490). As such then, it would appear that intuition could lead to improvisational behaviour occurring. Rational judgment meanwhile fails to account for novelty and unpredictability as well as the creativity of human action (Barret and Nissen, 2008). It tends to favour stability over change and fails to explain for social phenomena involved in change. As such, rational reasoning is mostly involved in routine, deliberate, mechanical episodes or punctuated chapters marked off by goal and implementation (Barret and Nissen, 2008). This would indicate that rationally minded managers would gravitate toward formalised strategic planning above improvisation.

This notion of either intuitive or rational judgment, however, is under studied in relation to organisational improvisation. Therefore, research on the dual process of reasoning (either intuitive or rational) of managers should examine this in greater detail as the relationship with improvisation is implied but nonetheless equivocal. According to Truman (1996), intuitive and rational thinking processes should be used together on improvisational practice. This concurrent process is best used in alternating stages, a stage of intuitive thinking where imagination is encouraged followed by a rational logical stage where ideas generated by the creative stage are analyzed,

grouped and selected; these procedures are particularly useful when traditional approaches are failing (Truman, 1996). Such a notion runs counter to most traditional thinking on improvisation where it is seen as purely a product of intuition but this does of course fail to account for time pressures. Strong time pressures may well force improvisation to occur whilst less time pressures may allow for a process as described by Truman (1996) to occur. Beyond this, Truman's (1996) work is interesting for improvisation theory as it suggests that improvisation and the drivers of it may be far more complex than traditional thinking would lead us to believe. That is, it relies on more complex processes and multiple factors beyond simply inclination and opportunity.

Many recent descriptive decision-making models have explicitly used a dual system theory of reasoning to explain decision making behaviour (Sloman, 1996; Leaptrott, 2005). These two systems -- experiential versus rationality can operate in parallel (integration between both systems) (Eipstein, 1994; Eipstein *et al.*, 1996) but each system delineate different cognitive reasoning / judgments which influence a diverse set of decisions and settings. In past research they have been treated as opposite two polar positions so as to ease measurement, operationalisation and so testing, but as Eipstein (1994) notes they can be seen as along a continuum. For the purposes of this thesis however, and for ease of measurement, it is decided to treat intuition and rationality as two forms of reasoning and not along a continuum.

An experiential system is "the fast, effortless, intuitive process that is subject to emotional influences and is utilised to make many decisions in near simultaneous manner"; whereas a rational system is "a slow, effortful, rational process that results in decisions that are made sequentially rather than simultaneously due to the cognitive limitations of the decision-maker"

(Leaptrott, 2006:19). Due to this, it can be noted that the style of the manager's reasoning and decision-making which is more towards experiential system (make decisions in concurrent approach; *e.g.* simultaneous strategic formulation and implementation process) tends to influence the incidence of improvisational activities in organisation. Alternatively, the manager's deliberate and rational system of reasoning which is more towards a sequential manner of decision-making tends to favour a step by step process and therefore the tendency to apply the incidence of firm's formalized strategic planning process is likely higher if compared to improvisational activities.

Even a cursory analysis of this literature indicates a lack of field research focusing on this area; therefore it is crucial to examine the relationship between the system of reasoning (the elements of cognitive ability of the manager of either deliberative rational or intuitive reasoning processes) and organisational improvisation. Based on theoretical perspectives presented, the reasoning process diverges into two modes of reasoning; rational and intuitive. In that case, the researcher needs to examine whether both factors significantly affect the incidence of organisational improvisation. Thus far it is apparent from the literature that intuition forms a basis for improvising in theory, and rationality would appear to be a congruent factor with strategic planning and therefore less likely to lead to improvisation. However, the work of Truman (1996) would lead us to believe that rational reasoning could be a factor in aiding improvisation to ultimately occur. Despite this, such an assertion is not accepted in current improvisation literature and as such the opposite is hypothesised here. Hence, the following hypotheses:

Hypothesis 1: The greater the rationality of the manager's reasoning process, the lesser the incidence of organisational improvisation.

Hypothesis 2: The greater the manager's intuitive reasoning process, the stronger the incidence of organisational improvisation.

3.3.1.2. Manager's Self-Confidence

Self-confidence has been found to influence cognition and behaviour (Hmieleski and Corbett, 2008). People of high self-confidence tend to set challenging goals, persist towards the achievement of goals under difficult and stressful circumstances; recover quickly from failure, be more satisfied with their jobs and experience greater levels of life satisfaction (Bandura, 1997; Hmieleski and Corbett, 2008) and can easily manage change (Leybourne, 2006). Further to this, Kanter (2002) states that improvisation requires confidence in one's ability to perform under distress. This statement is parallel to Crossan *et al.* (2005) where they suggest that having faith in one's ability to 'make do' is likely critical to effective improvisation. This means that the manager must have a high level of self-confidence to have faith in dealing with non-routine events (Weick, 1998), create and execute the strategy in a spontaneous way, as well as being able to think and decide creatively in a very limited time under uncertain conditions.

There are, however, a limited number of studies on the direct relationship between self-confidence and improvisation, despite it intuitively being a likely factor in driving improvisation to occur. To the author's best knowledge, only one empirical study by Hmieleski and Corbett (2008) has examined the relationship between self-confidence and improvisation but used self-confidence as a moderating factor in an entrepreneurial context. According to Leybourne and Sadler-Smith (2006), in their prescriptions for

future research, the use of intuition is often accompanied by a 'confidence' in their rightness and wrongness and it could directly relate to the actions of the managers. For example, the tendency of highly confident manager to make intuitive reasoning is greater if compared to managers lacking in confidence. Some scholars relate improvisation with intuitive decisions that guide actions (Hatch, 1997; Crossan and Sorrenti, 1998; Leybourne and Sadler-Smith (2006); Chelminski, 2007). It therefore reflects that the manager's confidence can create the incidence of intuitive action which then accelerates the improvisation of the whole organisation. However the relation between self-confidence and improvisation remains speculative due to the absence of research evidence (Leybourne and Sadler-Smith, 2006). It is believed that the tendency of organisational improvisation is influenced by a manager's self-confidence and therefore, it is hypothesized:

Hypothesis 3: The greater the manager's level of confidence, the stronger the tendency of organisational improvisation.

3.3.1.3. Manager's Expertise

Expertise encompass specialised skills and knowledge that individuals bring to an organisation or a team's task and is defined as domain-relevant and task-related skills that depend on innate cognitive abilities, innate perceptual skills, experience, and formal and informal education (Amabile, 1996; Amabile, 2001; Vera and Crossan, 2004). In the theatrical arena, for example, the more expertise the performer has from diverse fields of knowledge, the more options they will have when accepting a new role they have not played before (Vera and Crossan, 2005), thus it creates a more simple way to develop improvisation.

In the business arena, experienced and skilled managers tend to apply improvisation in their business operations. Skilled managers normally put their expertise in practice on a real-time basis (Cunha *et al.*, 2002) and mostly create successful firm outcomes. The significant elements of skills and expertise of the manager are the consideration of the type and degree of skills and expertise the manager has. The degree and type of skills and expertise may vary in different settings and they could have a differential impact on firm improvisation. Leybourne and Sadler-Smith (2006) demonstrate that experienced and skilled project managers improvise more than those with less experience. This is parallel to a study by Gibbons *et al.* (2005) where they reveal that the more experience the CEO has, the lesser the formalised planning that occurs. In relation to the type of skills, Whittington (1996) states that craftsman and bricoleur are the more important kinds of expertise if compared to technical analytical expertise as both types (craftsman and bricoleur) consist of creative and innovative elements that enable the implementation of improvisational activities.

Returning to a view of improvisation as a product of intuition, Leybourne and Sadler-Smith (2006) note that intuition is rooted in expertise that may well drive improvisation to occur. Intuition as distilled experience recognises that the quality of intuitive response depends upon the expertise or patterns of experience in a particular domain (Crossan and Sorrenti, 2002). In this case, the more experienced and skilled the manager is, the more likely they are to pursue intuitive behaviour; therefore the higher the tendency to apply organisational improvisation. This statement is still speculative due to the absence of empirical research however. Only one empirical study (by Vera and Crossan, 2005) has tested the link between improvisation and expertise where expertise acts as a moderating variable between improvisation and innovation. However, there is an absence of studies that discuss expertise as a

managerial individual characteristic that could possibly be one direct key influential factor on the propensity to improvise. It is held in this study that as skilled managers are likely to put their expertise into practice on a real-time basis, they are more likely to improvise. Therefore:

Hypothesis 4: The greater the manager's expertise, the stronger the organisational improvisation.

3.3.1.4. Manager's Attitude towards Risk

In organisations, the composition of the top management team should be a critical factor in explaining and promoting risk taking (Hambrick and Mason, 1984; Palmer and Wiseman, 1999). Individual risk taking is defined as the extent to which the managers are willing to engage in behaviours with uncertain and significant outcomes for the firm (Gilley *et al.*, 2002). MacCrimmon and Wehrung (1990) assert that the most successful executives are most often the biggest risk takers. In particular, managers who hold or own equity in their organisation are more likely to engage in higher levels of risk taking than non-owner managers (Saunders *et al.*, 1990; Galbraith and Merrill, 1991; Palmer and Wiseman, 1999). The benefit of risk taking behaviours by managers could include process enhancements, highly competitive new products or services, innovative marketing techniques and enhanced firm performance (Gilley *et al.*, 2002). In contrast, non-owner managers are more likely involved in risk-averse attitudes. And accordingly deviate away from perceived risky actions and behaviours, which in this current study is improvisation. According to Palmer and Wiseman (1999), this condition appeared due to downside effects of 'employment risk'. Non-owner managers may perhaps feel that taking risks jeopardises their employment and may lead to termination or firm bankruptcy (Walsh and Seward 1990; Palmer and Wiseman, 1999). Improvisation is inherently a risk laden

behaviour and one would then expect risk attitudes to influence the propensity to improvise.

The fundamental phenomenon that drives risk, specifically the willingness of top management executives to take risks and its effect on a broad variety of firm outcomes, has often been ignored by extant research (Gilley *et. al.*, 2002). Previous research mostly examines risk as an 'organisational risk' measure as a proxy for managerial risk taking (*e.g.* Bowman, 1982; Fiegenbaum and Thomas, 1988). However, Baird and Thomas (1985) and Palmer and Wiseman (1999) found that managerial risk should be in fact a separate construct from organisational risk. It is assumed that managerial tendencies for risk taking can have a positive influence on certain types of organisational outcomes (Baird and Thomas, 1985; Bettis, 1982; Bowman, 1982; Knight *et al.*, 2001). For instance, during the strategy formation process, managers are mostly involved in making decisions under uncertain business conditions. The manager, as the key decision maker, has to consciously acknowledge the potential risks of failure to meet target goals and choose to bear or not bear the risks associated with their available strategic alternatives (Baird and Thomas, 1985)

There are a limited number of studies that examine the effects of a manager's attitude toward risk taking in strategic management. One would suspect that attitude towards risk would preclude decisions to follow formalised strategic planning or tend toward improvisation, but such contentions have not been examined in any great depth in the literature. Therefore, it is appropriate and pertinent to examine this further in relation to improvisation as gravitating towards risk could motivate a strategic manager to disengage from planning and improvise.

Referring back to jazz and theatre metaphors, artistic performance is not solely dependent on the scores or scripts. Theatre actors and jazz musicians engage in creative and spontaneous acts which are largely reliant on interaction with the audience. This performing on the 'spur of the moment' indicates that good improvisers are risk takers (Barret, 1998). Risk can give either positive or negative outcomes however. In some conditions, especially when the strategic plan is failing, risk provides potential benefits of a positive outcome that far outweigh any negative result (Barret, 1998; Gilley *et al.*, 2002) but to take such risks would imply deviation from the plan and possible improvisation. In Weick's (1998) study of fire-fighters, for example, the study reveals that previous knowledge and information permits one fire-fighter to improvise an escape and save his life. Weick (1998) believed that without this positive attitude towards risk taking, this fire-fighter would not be able to create such improvised actions. The improviser, then, should have a proclivity towards risk during the strategy process for improvisational activities to arise. It therefore supports the proposition by Chelminski (2007), which suggests that risk taking could be one of the conditions for organisational improvisation. Nevertheless, the link between managerial risk taking and improvisation remains equivocal as no study has empirical and quantitative evidence that directly proves this relationship. In relation to managerial attitudes towards risk then, it is hypothesised that:

Hypothesis 5: The greater the manager's attitude towards risk, the stronger the organisational improvisation

3.3.2. Organisational Factors

In strategic management, planning and execution (implementation) are important elements of the strategy process for the firm. In the context of improvisation, planning and executing occurs simultaneously (Kamoche and

Cunha, 1998; Moorman and Miner, 1998b; Crossan *et al.*, 2005; Hmieleski and Corbett, 2006). Instead of focusing only on top management characteristics, it is important and crucial to examine elements of organisational factors that may drive organisations towards improvisation. As was established earlier in strategy process theory, the strategy process is directly driven by factors such as organisational structure and information and when it comes to improvisation in strategic management, it is crucial to examine these organisational structure and characteristics; and information processing within the organisation as these could believably impel improvisational behaviour. For instance, an absence of real-time information or sufficient information from memory renders rapid decision making risky and could reduce instances of improvisation. Similarly, where organisational structures are heavily bureaucratic and centralised a manager's ability to undertake rapid strategic decisions on their own and immediately implement them is compromised as the organisational system precludes this from occurring. In this study, two areas of organisational factors will be assessed to determine their impact on improvisation. These two areas are categorised as 'organisational structure and characteristics' and 'information processing'.

Organisational Structure and Characteristics

There are four proposed elements that will be used to reflect the effect of organisational characteristics on organisational improvisation. These four elements are clarity of goal, organisational structure, organisational flexibility and organisational risk taking. These elements are selected due to strategy process theory and knowledge gaps in the literature and ambiguous findings from previous scholars in relation to improvisation.

3.3.2.1. Clarity of Goal

The intention of organisational goals is to reflect and accomplish the vision and mission of the company (David, 2001). In organisations, a goal is a long-range target for a specific period. In order to attain goals, one has to define them in a manner that the goals must be short and clear and are tied to the mission of the company (David, 2001). This means that organisational goals must be specific, realistic, measurable and meaningful at all levels within the organisation (David, 2001). At this point, the leaders such as top level managers and strategic managers are the people who are heavily responsible for the clarification of business goals.

Clarity of goals is essential in organisations as it provides an indicator of strategic direction and precisely what the business seeks to achieve. A lack of such goal clarity could lead to unintended outcomes such as irrelevant strategising and implementation of plans inconsistent with what the business truly wants to achieve. Therefore, goal clarity can be a useful guideline for members of the organisation to understand and identify what must be done and so decide on strategic actions on how to get it done (MacKenzie *et al.*, 1998). Nonetheless, this link can be contended that high clarity of organisational goals could diminish organisational improvisation. Akgun and Lynn (2002) argued that having clear project goals limits creative and spontaneous decisions by project team members, specifically when the company is faced with rapidly changing conditions. For instance, under high technological turbulence, where most companies are faced with uncertainty and time pressures, the improvisational process is crucial especially when there is less certain project goals (Akgun and Lynn, 2002). It is believed that where goals are too clear it limits freedom of action as any action must be

taken within the closely defined limits of organisational goals (*cf.* Akgun and Lynn, 2002).

With regards to jazz metaphors, the musicians have to set their goals and clarify what needs to be played before they start the performance. Real-time composing, where the melody may remain open for improvisation, emerges during jazz performance (Weick, 1998) but still with clarity of vision of what is to be achieved. This condition is consistent with the organisational setting where clarity of goals is important prior to strategic improvisation. Clarity of goals provides a clearly defined strategic direction (MacKenzie *et al.*, 1998) and a crucial aim for the team's efforts (Millson *et al.*, 1992). It credibly creates guidelines for the project or team members so that it is not continually redefining its direction (Kessler and Chakrabarti, 1996; McDonough III, 2000; Hong *et al.*, 2004), or indeed, disregarding its direction. Scholars suggest that clarity of goals is imperative and significant for increasing decision speed (Cooper and Kleinschmidt, 1994; Murmann, 1994; Cooper *et al.*, 1998). With clear goals, the manager and employees can easily speed up the strategy process especially in the process of strategy formulation and implementation.

The relationship between clarity of goal and improvisation is still equivocal in the improvisational literature. No empirical evidence is found for a significant effect of clarity of organisational goals and improvisation, yet theoretically, it remains important. Further, there is some confusion as to whether goal clarity is good or bad for improvisation. Therefore, this study is important in clarifying this relation. To this end, a positive relation is expected on the basis that it allows for decision speed to be more rapid and that actions can be taken in the context of knowing what is sought to be achieved and as such, provides legitimacy for improvised actions taken:

Hypothesis 6: The greater the clarity of goal, the stronger the organisational improvisation.

3.3.2.2. Organisational Structure

Drawing on jazz improvisation, jazz musicians use structure in creative ways that enable them to alter the structural foundation of their playing (Hatch, 1999). This means that jazz improvisers can be more creative when playing in more loose structures (Hatch, 1999) or minimal structures (Kamoche and Cunha, 2001). It thus allows jazz improvisers to coalesce composition and performance (Kamoche and Cunha, 2001). Whilst looking at organisational perspectives, most successful organisations in highly dynamic environments constantly adopt a configuration of elements to facilitate rapid action (Cunha and Cunha, 2006a and 2006b). At this point, a minimal structure is one of the elements of configuration and a necessary condition for strategic improvisation (Cunha and Cunha, 2006a and 2006b). Parallel to this, the jazz metaphors could be introduced and applied in organisational improvisation, where it is believed that the concurrent process of strategic formulation and implementation can be done easily when the organisation applies minimal structures (Weick, 1998; Barret, 1999) as it is more likely to allow the freedom necessary for people to take actions without having to wade through bureaucracy prior to being allowed to take action.

This notion on the link between organisational structure and improvisation came from the conceptual studies proposed by much previous research (*e.g.* Weick, 1998; Barret, 1999; Cunha *et al.*, 1999; Kamoche *et al.*, 2003 and Cunha and Cunha, 2006a and 2006b). In essence, Bourgeois (1985) states that flexible, organic styles or in other words, minimal structures, are appropriate for turbulent, uncertain environments; while bureaucratic or mechanistic styles are suitable for stable, predictable environments. The

rationale for this being that in uncertain and turbulent times an organic structure will facilitate faster responses to changes in the environment. Organisational structures can be identified as providing a clear strategic intention, an adequate number of simple rules and sufficient individual freedom (Cunha and Cunha, 2006a and 2006b) that allows organisational members and managers to undertake their tasks with the minimum of bureaucratic constraints that would otherwise slow down their ability to undertake actions and decisions (Slevin and Covin, 1997). The organic or minimal structure then reflects low formalisation (relates to work rules and procedures) and decentralised decision making (Robbins, 2005). Cunha and Cunha (2001) propose that very high or very low levels of centralised/decentralised structure tended to hinder successful improvisation. Meanwhile Ford (2008) argues that organisational structure depends on the market conditions the company is facing. Organisations surrounded in stable and certain markets tend to form a mechanistic structure, centralised or hierarchical structure, with clearly bounded roles and defined lines of authority; whereas organisations embedded in unstable and uncertain market tend to form organic or minimal structures where the structure is more informal, with open lines of authority and communication and distributed decision making authority (Slevin and Covin, 1997; Ford, 2008).

According to Gibbons *et al.* (2005), a mechanistic firm emphasises more on a formal method approach to strategy development. A mechanistic structure tends to emphasise more bureaucratic conditions in the organisation and in turn becomes predisposed toward formal strategic planning. There are numerous aspects of bureaucratic organisations that impede improvisation (Webb and Chevreau, 2006), not least the tight control of information flows, centralisation of decision making authority in the upper most echelons of management, and formalised rules and procedures that hinder rapid decision

making and implementation. Such structures create an inertia that acts against improvisation and reduces the likelihood that it will occur. In contrast, organic/minimal structured firms (where the structure is more decentralised, informal and thus minimal) tend to emphasise more incremental and emergent approaches when developing the strategy (Gibbons *et al.*, 2005) and hence, improvisation.

As there is a lack of study of organisational structure and improvisation, there is a need to study further the direct relationship between minimal organisational structures and organisational improvisation. Accordingly, the following is hypothesised:

Hypothesis 7: The greater the firm's structure, the stronger the organisational improvisation.

3.3.2.3. Organisational Flexibility

Today, the tradeoffs of flexibility for efficiency are endemic in contemporary enterprise systems (Konsynski and Tiwana, 2004) and Scribner (1984) states that flexibility is one of the empirical features of improvisation. Managers are advised to plan activities in a flexible manner that allows changes as the project evolves for effective improvisation (Akgun *et al.*, 2006). Webber *et al.*, (1999) recommend that organisations seek to be more flexible and increase their likelihood of success in a fast-pace environment by executing actions through organisational improvisation. This parallels Jambekar and Pelc's (2007) study where they revealed that organisational improvisation capabilities may increase the flexibility and adaptability of the manufacturing environment in several areas such as product development, continuous quality improvement, product customisation, dynamic technology strategy and so forth. Flexibility is suggested to enable organisations to

manage uncertain and 'fast-occurring' markets effectively (Aaker and Mascarenhas, 1984) and endow a capacity to rapidly create and seize upon initiatives and opportunities (Evans, 1991; Grewal and Tansuhaj, 2001). It would appear, then, that being flexible and able to adapt would endow an organisation with the capacity to improvise.

Organisational flexibility provides a set of capabilities used to respond to various demands and opportunities existing in a dynamic and uncertain competitive environment (Konsynski and Tiwana, 2004; Hitt *et al.*, 2005), to quickly commit resources to new courses of action in response to those changes and recognise and act promptly when it is time to reverse existing resource commitments (Grewal and Tansuhaj, 2001; Shimizu and Hitt, 2004). In organisations, flexibility appears from the outcome of an interaction between the responsiveness of the organisation (organisational design) and managerial capabilities (Verdu-Jover *et al.*, 2008). For example, Raudsepp (1990) suggests that flexible individuals are able to explore a wide variety of approaches to a problem without losing their overall goal and purpose. This is contrary to less flexible individuals where they tend to be obsessed with stability, order, and precision and are more likely to suffer considerable anxiety and loss of control when confronted with changing circumstances. For this reason, flexible individuals within organisations could develop more flexible management systems and structure and means of operating, strategising and hence, decision making. The managerial flexibility will thus collectively create an organisational flexibility. Organisations need to be more flexible when they want to adapt and improvise their business (Akgun *et al.*, 2006), especially when they are faced with competitive intensity (Moorman and Miner, 1998b), high technological turbulence and high market demand. Previous studies suggest that organisational flexibility should be a combination of

repertoire of managerial and organisational capabilities that allow organisations to adapt quickly to environmental change (Teece, 1994; Sanchez, 1995; Grewal and Tansuhaj, 2001; Hatum and Pettigrew, 2006). For example, the flexibility of individual behaviour provides an indicator of a firm's flexibility because a firm achieves flexibility by coordinating behavioural scripts across individual and groups (Wright and Snell, 1998). In this case, individual managerial capabilities become embedded in organisational flexibilities; and therefore the managerial capabilities can be an organisational counter-part which determines organisational flexibility.

This study is, to the author's best knowledge, is the first to examine organisational flexibility as a direct factor that influences an organisation to improvise. Thus, the hypothesis is as follows:

Hypothesis 8: The greater the organisational flexibility, the stronger the organisational improvisation.

3.3.2.4. Organisational Risk Taking

Organisational risk can be viewed as the strategic behaviours undertaken during which the organisation may experience uncertain outcomes during their business operations. In strategic management, organisational risk taking is increasingly important because risk is embedded in most long-range decisions that can influence corporate and business strategy and business performance (Mintzberg *et al.*, 1976; Baird and Thomas, 1985).

There are two forms of risk taking behaviour in an organisation, the managerial attitude towards risk and organisational risk. These must be separately acknowledged by managers (Baird and Thomas, 1985; Palmer and Wiseman, 1999). Managerial risk taking is more related to the attitude of

managers either bravely to take risks or avoid any situations involving risks (thoroughly discussed in Section 3.3.1.4). It can be part of organisational risk but is separate as organisational risk encompasses greater elements (Palmer and Wiseman, 1999). Organisational risk is pertinently determined on those decisions by groups of decision makers in the organisation which concern investing resources in activities with uncertain outcomes. For example, decisions related to issues of innovation, research and development, company diversification, debt financing and capacity expansion are indicative of organisational risk taking behaviours (Baird and Thomas, 1985). A manager may be risk averse but the company as a whole may not be so. As strategic decisions on the whole are taken by the top management team, a greater propensity toward organisational risk could override a single manager's propensity towards risk. Further, the company may have historically invested in risky behaviour such as Research & Development, innovation and so forth which would suggest an organisation takes risks but a given manager could still be less open to taking risks that affect their immediate work and sphere of influence. As a single manager could make and take improvised decisions that concern the strategic direction and outcomes of the organisation, it is pertinent to separate out individual managerial attitude towards risk and hypothesis this separately.

A firm's competitive actions by their nature differ from those of other firms in the industry. Risk taking by organisations is extremely complex when compared to individual (managerial) decision makers (Baird and Thomas, 1985). Managerial risk taking provides only a partial explanation of firm performance uncertainty (organisational risk) (Palmer and Wiseman, 1999). Therefore, organisational risk taking assessment is important in determining the company's survival (Baird and Thomas, 1985) as well as on the effect of organisational improvisation.

Organisational risk has infrequently been addressed as a specific area of study in strategy formulation and implementation. Only some explicit attention to the role of risk in strategic planning is evidently proved by Gluck *et al.* (1980). As suggested by Cunha and Cunha (2003) and Chelminski (2007), organisational risk taking behaviour could affect improvisational activities (the concurrent strategic process of formulation and implementation) as taking such actions is inherently risky. An organisation with no history of risky behaviour is unlikely to allow for instances of improvisation to be widespread regardless of the actions and decisions of individual managers as improvisation is likely to be discouraged. Previous research on this topic is largely conceptual and the relationship between organisational risk taking and improvisational behaviour is still largely vague. Therefore, this study seeks to propose that organisational risk taking will affect organisational improvisation. The risk laden nature of simultaneously taking and implementing actions that are made on the basis of a lack of information, time pressures and clouded in uncertainty means improvisation is likely to be influenced by organisational predispositions to risk. In order to take such actions it would appear that risk taking is a necessity at the organisational level. Thus, it would appear a necessity for organisational risks to be allowed and tolerated for improvisation to arise. Consequently it is hypothesised that:

Hypothesis 9: The greater the organisational risk-taking, the stronger the organisational improvisation.

Information Processing

Another element to be considered in relation to improvisation is information processing within the organisation. The term 'information processes' in this study refers the information flows occurring in and around organisations (Knight and McDanish, 1979) which gathered and interpreted

by organisations participants (Berente and Vandenbosch, 2009). This includes the degree to which information is shared at all levels; the ability to gain the latest information about interdepartmental activities and the external environment; as well as the capability to keep records and managing the information system within the organisation. Hence, two variables will be measured and categorised as information processing: (1) organisational information; and (2) organisational memory. Scholars suggest that organisational information and organisational memory are the important elements that potentially trigger an organisation to improvise (Moorman and Miner, 1998b; Akgun and Lynn, 2002; Crossan *et al.*, 2005; Cunha and Cunha, 2006b, Leybourne, 2006).

3.3.2.5. Organisational Information

Looking at improvisation in the theatre arena, most actors (improvisers) act through face-to-face communication where most of them must have the capability of expressing ideas and emotions using a wide range of information and communication channels in real-time (McKnight and Bontis, 2002). To some extent, this real-time information and communication process allows improvisation to function properly (McKnight and Bontis, 2002). This analogy can be applied to the organisational setting where there is the likelihood that information can affect organisational improvisational activities.

Crossan *et al.* (2005) suggest that real-time information in firms can affect their resource allocation decisions mainly on plans if they lack background information about their external and internal contexts. This set of two categories relates to the information flow between the organisation and its environment; and the second relates to the intra-organisational information flows (Cunha *et al.*, 1999; Chelminski, 2007). These sets of factors are relevant

to determine the degree and quality of improvisational activity within an organisation. In another empirical research study, Vera and Crossan (2005) state that real-time information has a positive moderating effect between improvisation and innovation.

Referring to Souchon and Hughes's (2007) study on export improvisation, export information overload does not show any significant effect on improvisation. Suggesting improvisation can be information light or intense but regardless, information will aid improvisation in some way and one cannot have too much information when taking an improvised decision. Meanwhile, Moorman and Miner's (1998b) study on the relationship between real-time information flows and improvisation suggest different trade-offs for organisations. In this study, the researchers try to examine real-time flows influencing the 'incidence' and the 'effectiveness' of improvisation. The result demonstrates that real-time flows do not show any significant effect on the incidence of organisational improvisation. However, mixed results were found on the relationship between real-time flows and the effectiveness of improvisation (Moorman and Miner, 1998b). Organisational real-time information flows revealed a positive influence on the extent to which improvised new product actions influence design and market effectiveness (Moorman and Miner, 1998b). However, real-time flows do not have a positive influence on process outcomes such as the impact on cost and time efficiency, team learning (but exclude the condition of only when the real-time information flows are high) as well as team functioning (Moorman and Miner, 1998b).

In organisational change management, real-time information is imperative in order to achieve the successful management of change processes (Leybourne, 2006). Besides, this factor could also be important to

the management of the employees who are encouraged to improvise to achieve tasks and activities that support and trigger change (Leybourne, 2006). However, the results by Leybourne (2006) are hard to generalise to the whole population because his study was case study-based. Further, by referring back to previous empirical research, dubious results were found. There is still a lack of studies that focus on the direct relationship between real-time information and improvisation within organisations. Despite this, a positive relationship would be expected as set out beforehand. The following is then hypothesised:

Hypothesis 10: The greater the organisational real-time information, the stronger the organisational improvisation.

3.3.2.6. Organisational Memory

'Memory' is a factor that could be considered as an antecedent of improvisation. *"To improve improvisation is to improve memory, whether it is an individual, small group or organisational"* (Weick, 1998: 544). Organisational memory is the storage of skills and experiences (Akgun *et al.*, 2006) within the organisation and it represents learned ways of thinking and behaving and is often automatically activated in certain situations (Moorman and Miner, 1998b). Accordingly, one would expect instances of improvisation to increase as and when sufficient organisational memory can be relied upon. But, previous studies contend this assertion and prove that memory inhibits improvisational activities.

The study by Akgun *et al.* (2006) reveals that strong memory structure inhibits deviations from its previous knowledge store, thereby hindering improvisational activities. Comparable to this, Cunha *et al.* (2002) found that there is a significant relationship between a low procedural memory and firm

improvisation. They notice that improvisations appear to only occur when an organisation/individual manager does not have an adequate routine/procedural memory to respond to an unexpected situation (Cunha *et al.*, 2002). That is, memory provides a capacity to respond to situations by replicating successful past actions as stored in memory, which consequently lowers the need to actually improvise. This is consistent with the research by Moorman and Miner (1998b) which demonstrates that organisational memory has a negative effect on the incident of improvisation.

Vera and Crossan (2004) state that managers build their improvisational skills through exercise and lessons learned from the success and failures obtained in previous performances. The managers then absorb these lessons and store information in their mind, management information systems or databases and subsequently draw upon it when dealing with present improvisation (Vera and Crossan, 2004). Meanwhile, according to McKnight and Bontis (2002), improvisers build shared knowledge through tangible and intangible tacit knowledge which they draw upon. In an organisation, methods such as sophisticated technology (online company databases) and knowledge-sharing events (meetings or discussions) or simple bulletin boards and hardcopy documents can be developed to capture intellectual capital and make it accessible to all persons (McKnight and Bontis, 2002). Both assertions demonstrate the potential association on the significant effect between memory and improvisation; as revealed by Souchon and Hughes (2007)'s study which exhibits a direct positive significant effect between expert memory and improvisation.

The contradictory findings in previous studies could well relate to the understanding of how organisational memory is stored; be it through procedural or declarative memory, which could possibly vary the value of

improvisation (Moorman and Miner, 1998b). For instance, procedural memory is memory storage of skills, sequences of events, processes and routines such as team cooperation routines (Kyriakopolous, 2004). Following too rigid to procedures and routines may inhibit creativity and spontaneity and therefore could obstruct the improvisational process. Declarative memory, by contrast, is “memory for facts, events, or propositions” (Cohen, 1991:137), which is more general in nature; and this memory may possibly promote to organizational improvisation. However, according to Vera and Crossan (2005), “*memory becomes a useful resource for improvisation because it is the result of the creative recombination of previously successful routines of knowledge and action*” (p: 209). This indicates that improvisation can be more effective and innovative solution when organisations have the capabilities to access and retrieved to such diverse memory resources (*e.g.* through procedural and declarative) (Vera and Crossan 2004; 2005).

As few extant researches have empirically tested the association between memory and improvisation, the direct relationship between organisational memory and its effect on improvisation is still in the infancy stage. Therefore the potential relationship between these variables is deserving of further study. For the purposes of this study then, the following is hypothesised:

Hypothesis 11: The greater the organisational memory, the greater the organisational improvisation.

3.3.3. Organisational Improvisation and Performance

Improvisation can be considered a tool to developing strategy that helps executives identify key decisions that are needed to create more shareholder value (Mankins and Steele, 2006). This shareholder value can be a desirable strategic outcome for the organisations. According to Srivastava *et al.* (1999),

organisations can create customer value through the management activities such as products or services development management, supply chain management and customer relationship management. All of these management activities have the potential benefits of accelerating and enhancing cash flows, reducing risk, creating firm image which in turn contribute to shareholder value. This signifies that the shareholder value should not only be contributed by the internal outcome (e.g. long term profits, sales growth and financial resources) but it is also noteworthy to highlight on external outcomes such as the perspective and standpoint of customers toward firm. For instance, outstanding service through improvisation in the high technology service firms is central as it could enhance not only organisational sales growth and profits, but also the development of customer loyalty and the image of the firm.

Leybourne (2006) in his study suggests that organisational improvisation varies in terms of internal and external outcomes. The external outcomes are more derived from customer aspects such as customer loyalty (Leybourne and Sadler-Smith, 2006) and firm's image (Weick, 1999). Internal outcomes are expected to be amenable to rational analysis. These outcomes tend to derive from time, scope and cost such as the degree of return on investment, return on asset, resource allocation and so forth (Leybourne and Sadler-Smith, 2006). However, some scholars measure outcomes through financial and non-financial business performance.

Conventional measures of performance through the 1980s and 1990s were typically highlighted more on financial data and financial accounting metrics (Conant *et al.*, 1990; Ketchen *et al.*, 1993; Jennings and Seaman, 1994) compared to non-financial indicators. The financial data include measures of profitability, such as traditional accounting measures of Return on Investment

(ROI), Return on Equity (ROE), Return on Sales (ROS), growth in revenue, and cash flow; whereas non-financial indicators can be market share or/and research and development (Chakravarthy, 1986). A relationship between non-financial performance and financial performance within strategic business unit is conceptually specified in the literature (Greenley, 1994; Chakravarthy, 1986), but up till now empirical evidence on these distinguish aspects is still insufficient and vague (Markoczy, 2001) specifically in organisational improvisation literature. Therefore, it is significant in this research to include financial and non-financial aspect of either originate from internal or external outcome (as suggested by Leybourne and Sadler-Smith, 2006) as firm performance indicator.

Firm performance and organisational improvisation relationship has currently been noticed lacking in empirical research. Previous research such as Moorman and Miner (1998b), Akgun and Lynn (2002) and Vera and Crossan (2005) examine new product development to determine the effectiveness of organisational improvisation. Other empirical studies, for instance by Souchon and Hughes (2007), reveal that export performance is a positive outcome of export improvisation with the moderating effect of export coordination; meanwhile Hmieleski and Corbett's (2006) study the link between entrepreneurial improvisational behaviour and venture performance. According to Hmieleski and Corbett (2006), there is no direct relationship between entrepreneur improvisational behaviour and new venture performance.

The investigation of organisational improvisation outcomes is a necessity as it can provide a guideline for the organisations to measure their success or failure. In strategic management, this outcome (either good or bad) would help top management to redefine their business process which can

show the way to achieve profitability as well as the potential benefits of competitive advantage and improved market standing (David, 2001; Thompson and Strickland, 2004). Much previous empirical research examines the association between strategic management practices and organisational performance (*see* Trow, 1961; Thune and House, 1970; Karger and Malik, 1975; Eastlack and McDonald, 1970; Burt, 1978; Acklesberg and Arlow, 1985; Bracker and Pearson, 1986; Greenley, 1986; Pearce, *et al.*, 1987a; Pearce, *et al.*, 1987b; Bracker *et al.*, 1988; Boyd, 1991; Powell, 1992; Robinson, 1992; Capon *et al.*, 1994). But, no study traces a direct association between organisational improvisation and firm performance as a whole, specifically from a strategic management perspective. Therefore, it is critical and of significance to examine the relationship between organisational improvisation and firm performance. As improvisation is supposedly to confer benefits of rapid adaptation and response to opportunities, competitors, markets and customers (*cf.* Crossan *et al.*, 2005) it would appear that hypothetically, positive performance benefits would accrue (notwithstanding the negative potential for biased learning and opportunity traps). It is hypothesised then that:

Hypothesis 12: The greater the organisational improvisation, the stronger the firm performance.

3.3.3.1. External Environmental Turbulence as Moderating Variables between Improvisation and Firm Performance

Most previous researchers tend to assume that improvisation may lead to superior performance through the benefits of environmental turbulence (Eisenhardt and Tabrizi, 1995; Moorman and Miner, 1998b; Akgun and Lynn, 2002; Hmieleski and Ensley, 2004). Some scholars (*i.e.* Crossan *et al.*, 1996; Moorman and Miner, 1998b; Akgun and Lynn, 2002) relate

organisational improvisation to a jazz performance. In jazz bands, the musicians perform in fluctuating situations such as the reaction from audience; whereas in organisations, most businesses perform under turbulent environments. This indicates that environmental turbulence in this context can be as a moderating factor to the improvisation-performance relationship.

Some empirical results support the moderating role of environmental turbulence on the improvisation-performance link (Eisenhardt and Tabrizi, 1995; Moorman and Miner 1998b; Akgun and Lynn, 2002). According to Eisenhardt and Tabrizi (1995), improvisation activities speed up product development in uncertain settings. Moorman and Miner (1998b) discover that environmental turbulence has equally mixed effects on improvisation-performance relationships. Turbulence improves the extent to which the team reports it has learned and functioned smoothly while taking improvised actions; however, the relationship between improvisation and cost efficiency becomes weaker (more negative) when turbulence is high (Moorman and Miner, 1998b). Akgun and Lynn (2002) disclose that improvisation has recently been applied positively to new product development teams that operate under turbulent environments. In this case, the identification on the situation in which improvisation is applied can help to envisage its effectiveness (Vera and Crossan, 2001; 2006). This condition can possibly produce positive performance outcomes when improvisation takes place in highly turbulent environments (Vera and Crossan, 2001; 2006).

Environmental turbulence can be considered a situation where the management of a firm is facing a state of flux and an unpredictable business environment, particularly when it has relatively little information about its external environment (Stacey, 1993). The principle conception in strategic management is that environmental conditions and organisational capabilities

and resources must be coordinated in achieving organisational performance and to facilitate this, a strategist has to find or create this match or fit between internal and external conditions (Bourgeois, 1985). Successful organisations must consider the degree of strategic fit between environmental trends (threats and opportunities) and an organisation's distinctive competences (strengths and weaknesses) (David, 2001; Thompson and Strickland, 2004; Hughes and Morgan, 2008). The involvement of strengths and weaknesses can appear from internal environmental factors such as organisational resources, characteristics, processes and so forth; meanwhile the external environmental factors (such as technological, market and competitive factors) can come out from factors outside the firm which will have a direct or indirect effect on firm performance.

Once the environment wherein an organisation operates experiences a large number of changes and becomes clouded by highly turbulent conditions, the organisation might push to gain either business opportunities or counteract threats that could benefit or hamper organisational performance. This scenario of environmental turbulence is out of management's control. According to Eisenhardt and Tabrizi (1995), the organisation has several choices when this scenario happens. For instance, the organisation can continue with previous strategic plans by ignoring other external demands which suggest the need to change plans; or it can try to speed up its planning and execution processes with the intention that they can remain distinct; or it can apply toward an improvisational approach where planning and execution processes emerge concurrently (Eisenhardt and Tabrizi, 1995). In such circumstances, fast changing environments could obstruct the value of existing internal competencies (Tushman and Anderson 1986) as well as organisational performance (Atuahene-Gima and Li, 2004). Therefore, it is necessary for organisations to employ an improvisational approach in order

to enhance organisational performance, specifically when the organisation is faced with turbulent environmental conditions.

In particular, environmental turbulence has been viewed by theorists and practitioners as a source of uncertainty (Greenley, 1995; Ottesen and Grønhaug, 2002 and 2004) and *"it is often thought of as discrete, salient and unpredictable events in the environment"* (Ottesen and Grønhaug, 2004:956). Environmental turbulence can consist of many factors, but most scholars especially in market orientation literatures suggest that the primary elements of environmental turbulence comprise of market turbulence, technological turbulence and competitive intensity (Kohli and Jaworski, 1990; Narver and Slater, 1990; Greenley, 1995; Ottesen and Grønhaug, 2004; Shoham *et al.*, 2005). Market turbulence refers to *"...changes in the composition of customers and their preferences"* and technological turbulence refers to changes rapidly and swiftly in *"...the entire process of transforming inputs to outputs and the delivery of those outputs to the end customer"* (Kohli and Jaworski, 1990:14). Competitive intensity is related to the presence of multiple choices for customers (Kohli and Jaworski, 1990). In the conditions of competitive turbulence, competitors commonly move in and out of markets and rapidly shift their strategies. Under turbulent environments, organisations that are able to be a market leader may have to have the ability to make a continuous innovation, establish customer networks, and share responsibility for new strategy throughout the firm (Chakravarthy, 1997). In addition, they may also need to poise the firm's capabilities for leveraging, strengthening, and diversifying its distinct assets or skills (Chakravarthy, 1997).

In the real world, most organisations may not be able to follow the usual process of primarily analysing the market to identify opportunities; and then continue to spend more time to develop new products and strategies to

target such opportunities. In order to be creative and spontaneous under turbulent conditions, the organisation must be willing to shed the commitment to its existing resources and to identify novel linkages that are likely to better fit the emerging customer needs, technologies, and competitive situation (Zahra *et al.*, 1997; Ottesen and Grønhaug, 2004; Akgun *et al.*, 2007). Here, the improvisational approach is important and essential to commit with this scenario.

In past research environmental turbulence has primarily been studied in terms of its potential moderating effect on the market orientation and performance relationship (*e.g.* Jaworski and Kohli, 1993; Slater and Narver, 1994, Greenley, 1995) and on the planning and performance relationship (*e.g.* Fredrickson, 1984; Atuahene-Gima and Li, 2004; Atuahene-Gima and Murray, 2004). But recently, environmental turbulence has received attention in the improvisation literature and a few scholars have found that environmental turbulence can give a significant effect on improvisational activities within the organisation. Akgun and Lynn (2002), for example in their study revealed that for turbulent markets and technologies, improvisation is positively associated with speed-to-market. This means that changing customer preferences, exponential technological developments, increase in competitive demand and readily available information from markets and technologies can force organisations to create new product in a speedy pace (Akgun and Lynn, 2002). Mintzberg and McHugh (1985), Brown and Eisenhardt (1995), Eisenhardt and Tabrizi (1995), Cunha *et al.* (2003) and Cunha and Cunha (2005) in another way have argued that the increased speed of competition might lead organisations to develop an improvisational competency. This condition can be elaborated that organisations often respond to such situations by improvising because the demands emerge more rapidly than an organisation can foresee (Moorman and Miner, 1998b).

Cunha *et al.* (2003) suggest that the role of turbulence may be more complex. Their research suggests that environmental turbulence has a curved relationship with the presence of improvisational leadership, where very low or very high levels of turbulence reduce the likelihood of occurrence of this type of improvisational leadership. Meanwhile, Cunha and Cunha (2006b) propose that the fast changing environments lead to higher levels of strategic improvisation and strategic improvisation leads to a faster response to changes in the competitive environment as well as enhancing performance (Moorman and Miner, 1998b; Akgun and Lynn, 2002; Vera and Crossan, 2005; Hmieleski and Corbett, 2006;). To some extent, in order to examine the link between improvisation and performance, it is assumed that the competitive turbulence is the important component which moderates those factors. However, some scholars probably consider technological turbulence as the single most important component (Moorman and Miner, 1998b). For example, Mason (2007) says that (environmental) turbulence “...is caused by changes in, and interaction between, the various environmental factors especially because of advances in technology and the confluence of computer, telecommunications and media industries” (p.11). This signifies that most organisations might have to improvise their business process in order to enhance their business performance as well as to cope with the changes in turbulent environment, specifically if they are facing with high technological turbulence.

As yet, no empirical evidence traces the moderating effect of technological, market and competitive turbulence on the improvisation-performance relationship. Therefore, this study comes out with three specific hypotheses. The hypotheses are as follows:

Hypothesis 13: The stronger the technological turbulence, the stronger the relationship between organisational improvisation and firm performance.

Hypothesis 14: The stronger the market turbulence, the stronger the relationship between organisational improvisation and firm performance.

Hypothesis 15: The stronger the competitive turbulence, the stronger the relationship between organisational improvisation and firm performance.

3.4. Concluding Remarks

This chapter reviewed each proposed variable that will be used to test the model of this study through hypotheses development. Each hypothesis was developed in testing the significant relationship among the proposed variables. Table 3-1 provides a summary of previous literatures which can be considered as core references which have informed and/or inspired hypotheses development. The summary of proposed hypotheses can be seen in Table 3-2.

TABLE 3-1:SUMMARY OF CORE PREVIOUS LITERATURES INSPIRING THE HYPOTHESES STUDY

Hypothesis	Previous research
<i>Hypothesis 1 and Hypothesis 2</i>	Weick (1998); Leaptrott (2006); Leybourne and Sandler-Smith (2006)
<i>Hypothesis 3,Hypothesis 4 and Hypothesis 5</i>	Moorman and Miner (1998b); Cunha <i>et al.</i> ,(1999); Kamoche <i>et al.</i> (2003); Vera and Crossan (2005); Leybourne and Sadler-Smith (2006); Chelminski (2007)
<i>Hypothesis 6, Hypothesis 7, Hypothesis 8 and Hypothesis 9</i>	Moorman and Miner (1998b); Cunha <i>et al.</i> , (1999); Akgun and Lynn (2002); Kamoche <i>et al.</i> (2003); Vera and Crossan (2005); Hmieleski and Corbett (2006); Chelminski (2007); Souchon and Hughes (2007)
<i>Hypothesis 10 and Hypothesis 11</i>	Moorman and Miner (1998b); Cunha <i>et al.</i> ,(1999); Akgun and Lynn (2002); Kamoche <i>et al.</i> (2003); Vera and Crossan

	(2005); Souchon and Hughes (2007)
<i>Hypothesis 12, Hypothesis 13, Hypothesis 14 and Hypothesis 15</i>	Moorman and Miner (1998b); Akgun and Lynn (2002); Cunha and Cunha (2006b)

TABLE 3-2: SUMMARY OF HYPOTHESIS TESTING

Hypothesis	Test of relationship
Hypothesis 1	The greater the rationality of the manager's reasoning process, the lesser the incidence of organisational improvisation
Hypothesis 2	The greater the manager's intuitive reasoning process, the stronger the incidence of organisational improvisation
Hypothesis 3	The greater the manager's level of confidence, the stronger the tendency of organisational improvisation
Hypothesis 4	The greater the manager's expertise, the stronger the organisational improvisation
Hypothesis 5	The greater the manager's attitude towards risk, the stronger the organisational improvisation
Hypothesis 6	The greater the clarity of goal, the stronger the organisational improvisation
Hypothesis 7	The greater the organisational structure, the stronger the organisational improvisation
Hypothesis 8	The greater the organisational flexibility, the stronger the organisational improvisation
Hypothesis 9	The greater the organisational risk-taking, the stronger the organisational improvisation
Hypothesis 10	The greater the organisational information, the stronger the organisational improvisation
Hypothesis 11	The greater the organisational memory, the stronger the organisational improvisation
Hypothesis 12	The greater the organisational improvisation, the stronger the firm performance.
Hypothesis 13	The stronger the technological turbulence, the stronger the relationship between organisational improvisation and firm performance.
Hypothesis 14	The stronger the market turbulence, the stronger the relationship between organisational improvisation and firm performance.
Hypothesis 15	The stronger the competitive turbulence, the stronger the relationship between organisational improvisation and firm performance

The hypotheses of this study need to be tested and analysed. The next chapter (Chapter 4) will focus on the research design and research method to be employed in testing and analysing the hypotheses of this study.

Research Design and Empirical Method

4.1. Introduction

The previous chapters (Chapter 2 and Chapter 3) extensively reviewed extant literature to build a conceptual model and develop research hypotheses regarding the foundations of organisational improvisation and associated firm performance implications. However, this conceptual development remains theoretical if it is not empirically tested against real world phenomena (McNeill, 1985). Therefore, it is crucial that the conceptual model and research hypotheses are subsequently tested through the execution of an empirical research design. Therefore, this chapter presents the development of a research design and outlines the empirical method to be employed to test the research hypotheses.

A research design is plans and procedures which are used to structure the research (Creswell, 2009). A choice of research design should stem from the research problem, specifically, from the research objectives and questions and from the hypotheses under investigation (Churchill, 1999; Balnaves and Caputi, 2001). The research design should also reflect the decisions about priority being set to a range of dimensions of the research process (Bryman and Bell, 2007). Regarding this study, the research objectives and proposed hypotheses are oriented towards theoretical verification and empirical observation and measurement (*see* Chapter 1, Section 1.3 for Research Objectives and Research Questions; Chapter 3, Section 3.3 for Research

Hypotheses). Therefore, these criteria can guide the researcher in designing an appropriate research methodology.

A research design can also act as a blueprint for approaching the study, guiding the generation and analysis of data (Creswell, 2009). According to Creswell (2009), designing a research study involves intersections of research philosophy, research strategies (*e.g.* qualitative, quantitative or mixed methods strategies), and specific research methods (*e.g.* data collection, data analysis and etc.). Each element as outlined will now be discussed.

4.2. Research Philosophy

A research philosophy can be viewed as a set of beliefs including the nature of reality (ontology), beliefs about how knowledge is acquired (epistemology) and the nature of how methods are used (methodology) (Guba and Lincoln, 1994). The identification of which paradigm or epistemological consideration is important because it will not only affect the research design, methodology and analysis, but also the literature review and hence the conceptualising of the model (Myers, 1997; Bryman and Bell, 2007). The core contemporary epistemological issue concerns the extent to which the social world might be studied in an approach consistent with the methods of the natural sciences and the extent to which any epistemological distinctions, which may arise, mark out the study of the social world as both qualitatively and quantitatively different in kind from the study of the natural world (Wight, 2006). As such, the determination of the research paradigm is an important first step in designing a research strategy because this paradigm is shaped by the discipline area of the researcher, their beliefs and past research experience (Creswell, 2009). The types of belief, for example, held by an

individual researcher will mostly lead to embracing a research methodology of quantitative, qualitative or mixed method approach (Creswell, 2009).

The most important paradigms are those that relate to the fundamental stance that guides the research (Myers, 1997). Theoretically, research paradigms can be categorised into positivistic, interpretivistic and critical theory (Orlikowski and Baroudi, 1991; Guba and Lincoln, 1996; Myers, 1997). However, the most ongoing and widely used approach is positivist and interpretivist paradigms (Newman, 2006). *“Positivist studies are premised on the existence of a priori fixed relationship within phenomena which are typically investigated with structure instrumentations”*; whilst, *“interpretivist studies assume that people create and associate their own subjective and inter-subjective meanings as they interact with the world around them”* (Orlikowski and Baroudi, 1991:5). Each paradigm is associated with different approaches and diverse research techniques. Before selecting and deciding on a suitable philosophical standpoint (research paradigm) which could be taken in this study, it is important to explain each paradigm. A table of comparison of the different paradigms is illustrated in Table 4-1.

TABLE 4-1: RESEARCH PARADIGM

	Positivism	Interpretivism
Ontology	<ul style="list-style-type: none"> • Realism: reality is assumed to exist, driven by immutable natural laws and mechanisms. • Deterministic and reductionist • Causes and effects derive through deductive logic. 	<ul style="list-style-type: none"> • Relativist: realities exist in the form of multiple mental constructs, socially and experimentally based. • Study meaningful social action and gather large quantities of qualitative data to acquire an in-depth understanding of

		<p>how meaning is created.</p> <ul style="list-style-type: none"> • Theories derive through inductive logic.
Epistemology	<ul style="list-style-type: none"> • Dualist or objectivist • Investigator and investigated object are assumed to be independent entities. • Not value-laden nor subjective, nor biased, thereby automatically excluded from influencing any of the outcomes. 	<ul style="list-style-type: none"> • Subjectivist • Inquirer and inquired are fused into a single entity. Findings are the creation of the process of the interaction between the two. • Subjectivity and works from realised bias and connected ethical concerns.
Research Methods	<ul style="list-style-type: none"> • Focus on empirical test (verification/falsification; proof/refutation) • Research Techniques: Theorem proof, laboratory experiments, field experiments, surveys, case studies, forecasting, simulation 	<ul style="list-style-type: none"> • Hermeneutic, dialectic • Research techniques: Subjective/argumentative, reviews, grounded theory, action research, descriptive/ interpretive studies, future research, roles/ game playing/ simulation, ethnography

Adapted from Orlikowski and Baroudi, (1991); Guba and Lincoln (1994); Travis (1999); Newman (2006)

The primary concern of this study is to generate knowledge by applying the conceptual model and testing the research hypotheses of the study. Theory verification, which is based on the empirical observation and measurement of the research objective, is required to justify knowledge claims. As established, this study is the first to investigate organisational improvisation from a 'strategy process' and contingency theory perspective. Thus far, the researcher has generated a conceptual grounding to examine

organisational improvisation from a strategic management perspective by developing a conceptual model that comprises specific research hypotheses (e.g. to determine the antecedent factors that drive organisational improvisation; and to examine the external contingencies that affect the relationship between firm improvisation and performance).

This shows that an individual researcher of this study begins with a theory generation, collects data to determine whether either support or refuted the theory (that is the process of theory verification), and then makes necessary revisions before additional tests are made (Creswell, 2009). The applications of straightforward “objective”, empirical observation (surveys) and measurement and the need for theory verification therefore demonstrate that a positivist epistemological stance is justifiable for this study.

4.3. Research Strategies

Research strategies or strategies of enquiry are types of quantitative, qualitative and mixed methods designs that offer specific direction for procedures in a research design (Creswell, 2009). The quantitative research is a way of testing objective theories by examining the relationship among variables; whereas the qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social and human problem (Creswell, 2009). As such, a mixed methods strategy can be categorised as incorporating elements from both quantitative and qualitative approaches (Creswell, 2009). Different strategies might consider different research design. Therefore, the researcher needs to choose which design should be used to be suited to the research strategy in this study. The summary of alternatives of research design which relates to strategies of inquiry can be seen in Table 4-2.

TABLE 4-2: ALTERNATIVE STRATEGIES OF INQUIRY

Quantitative	Qualitative	Mixed Methods
Experimental designs Non-experimental designs (cross-sectional design)	Narratives research Phenomenology Ethnographies Grounded theory studies Case study	Sequential Concurrent Transformative
<i>Note:</i> This information was adapted from Creswell(2009)		

The research undertaken using most quantitative research methods assumes that only observed, objective phenomenon and positive facts are worthy of attention (Doyle *et al.* 2005). With regards to the principle objectives and questions; the epistemological stance (positivism); and the verification of hypotheses and model development of this study, it is significantly supports that the quantitative strategies need to be employed in this study. This study needs to exclude a qualitative strategies because this approach only favours when the main research objectives are to seek meaning and an in depth understanding of phenomenon, (*e.g.* processes; events, procedures, beliefs, knowledge) especially in complex and deeply embedded in its context (*e.g.* attention to narratives, personal experiences and language) (Andet and d'Amboise, 2001; Doyle *et al.*, 2005). The use of qualitative research of strategies is to position the reasoning and methods in an inductive, interpretive approach to science and understanding (Doyle *et al.*, 2005). This interpretive paradigm of the social sciences acknowledge the ability of human beings to interpret their world and to give meaning to their subjective experience (Doyle *et al.*,2005); by which contrary to the positivist stance in this research.

Further, due to the limitations of qualitative and mixed-method research in terms being both time and resources intensive in analysing data in depth, therefore it is more practical for this study to rely only on quantitative

research methods for data generation and theory verification. Upon consideration of the research question and conceptual framework presented in Chapter's 1 and 2, and in light of the above overview of the fundamental epistemological assumptions that direct research, the researcher for the purpose of this study has adopted a positivist stance. This decision was deemed appropriate for the testing of the conceptual framework and the subsequent answering of the research question. However, the researcher recognises and acknowledges the limitations informed by this choice.

In quantitative research, the researcher should choose which alternatives of quantitative strategies that can be fitting for this research. The considerations of alternatives of quantitative strategies of inquiry include experimental research and non-experimental research (*e.g.* survey design). Bryman (2001) among many others (Churchill, 1995; Burns, 2000; Churchill and Iacobucci, 2002; Malhotra and Birks, 2006; Bryman and Bell, 2007;) acknowledges three generic research designs applicable to social science research. These are expressed in the social science literature as exploratory, descriptive and causal/experimental research designs.

4.3.1. Exploratory Research Design

Exploratory research is used principally to gain a deeper understanding on new subject area. It is more appropriate to do exploratory research in social science when a researcher wants to study and generate a new subject area (Balnaves and Caputi, 2001), and to facilitate the researcher's understanding and knowledge of the problem at hand (Churchill, 1999). Besides, exploratory research is also useful to test methods such as questionnaires items (Churchill, 1999). Exploratory research can be considered as the initial phase of a study (Churchill, 1999). It is used to aid the construction of explicit hypotheses, and

not to specifically test explicit hypotheses (Platt, 1992). An exploration of a researcher into a specific problem can facilitate the creation of explicit research hypotheses which can be tested through a descriptive study (Churchill, 1999). This signifies that exploratory research is seen as a precursor to descriptive research (Churchill, 1999).

4.3.2. Descriptive Research Design

Descriptive research design is the most commonly used in social science study. The rationale to employ this research design is when the purpose of the research is to describe the characteristics of certain groups, to estimate the proportion of people in a specified population who behave in a certain way, and to make specific predictions (Churchill and Iacobucci, 2002); as well as when researchers wish to describe the relationship between two variables and therefore researchers need to generate data on the specific hypotheses to enable the relationship to be described (Churchill, 1999). Churchill and Iacobucci (2002) suggest a descriptive research encompasses an array of research objectives, arguing that a good descriptive study presupposes much prior knowledge about the phenomenon studied. Further, such research rests on one or more specific hypotheses, which guide the research in specific directions:

“Descriptive studies can be considered rigid...require a clear specification of the who, what, when, where, why, and how of the research”

(Churchill and Iacobucci, 2002: 108).

Descriptive research is deemed as rigid comparative to the flexibility of an exploratory study (Churchill, 1999). This is due to research questions, hypotheses, unit of analysis, research methods and measures to be used, and

the data analysis techniques to be deployed need to be clearly clarified before the generation of the data (Churchill, 1999; Miller, 2000). Further, the sampling procedure also needs to be identified in this research designs in order to ensure a representative sample of the population (Bryman, 2001) before researchers start for data generation.

The basic division of descriptive research is between longitudinal and cross-sectional designs (Churchill, 1999; Bryman, 2001). A cross-sectional design relates to predominant data collection by using a questionnaire or by structured interview on more than one case and at a single point in time (Bryman and Bell, 2007). This research design is mainly used in order to collect a body of quantifiable data in relation with two or more variables, which are then examined to detect patterns of association (Churchill, 1999; Bryman and Bell, 2007). It requires a large number of the population to be sampled in order to obtain sufficient responses to determine relationships between variables; as well as to ensure accurate and reliable findings (Churchill, 1999; Miller, 2000; Bryman and Bell, 2007). However, cross-sectional designs are time-consuming and costly when questionnaires are deployed as the research instrument (Churchill, 1999). Further, it also suffers from its lack of temporality and power to infer causality (Churchill, 1999).

In contrast a longitudinal design is typically used to map change in business and management research (Bryman and Bell, 2007) by repeatedly measuring variables over time (Churchill, 1999; Mitchell and James, 2001). By using a longitudinal approach, changes in the criterion (dependent) variable can be more readily identified as it captures the effects of time (Churchill, 1999; Mitchell and James, 2001) and in turn may allow for causal inferences to be made (Bryman and Bell, 2007). The drawback of this research is the large cost and time considerations (Bryman and Bell, 2007).

A survey research is the most popular and common technique in business and management research (Creswell, 2009). The survey research design can follow either a cross-sectional survey design or a longitudinal design (Creswell, 2009). This research involves a study of a sample of a particular population and provides a quantitative description of trends, attitudes, or patterns of past behaviour, or opinion of a population (Creswell, 2009). To use a survey design, the researcher needs to clearly define independent and dependent variables and a specific model of the expected relationships, which can be tested against observations of phenomenon (Galliers, 1992).

4.3.3. Experimental Research Design

In experimental research, the concern is with determining cause-and-effect relationships (Churchill and Iacobucci, 2002). Here, an attempt is made to specify the nature of the functional relationship between two or more variables, the independent variable(s) and dependent variable(s). The basic assumption underlying causal research, then, is that some variables cause or affect the values of other variables (Tull and Hawkins, 1984). Experimental research therefore seeks to determine whether a specific treatment influences an outcome (Creswell, 2009). In experimental research, the researcher needs to determine which type of experiments need to be employed in their study, whether either to use laboratory experiments or field experiments. The laboratory experiments occur in a laboratory setting, whereas field experiments arise in real-life setting, such as in a classrooms or organisations. By using experimental design, the researcher has far greater influence over the experimental arrangements such as a higher level of control which enhance the internal validity of the study (Bryman and Bell, 2007).

However, this experimental design suffers from a number of limitations. The degree of control used in an experiment can affect results. These “true” field experiments, for example, are rarely used in business and management research (Bryman and Bell, 2007). This is mainly due to the problem of achieving the required level of control when dealing with organisational behaviour (Bryman and Bell, 2007). In reality, it is impossible to make a fully experimental control because irrelevant variables (*e.g.* background noise or intelligent) may influence subjects and confound results (Miller, 2000). Further, in experimental designs, external validity is likely to be difficult to establish (Churchill, 1999; Miller, 2000; Bryman and Bell, 2007).

4.3.4. Choice of Research Strategy

After reviewing various types of research strategies, a descriptive cross-sectional survey design is thought to be the most appropriate research design to be used in this study. First of all, this selection is derived from the principle objectives of this study which focus on the investigation of the association between the antecedent factors of organisational improvisation, as well as the improvisation-performance link of high technology-based companies in Malaysia. A longitudinal design is deemed inappropriate for use in this study due to time and cost constraints surrounding the research.

Secondly, a large sample size is required to represent the population of high technology-based companies in Malaysia. Due to time constraints and the need for a large number of participants, an experimental design was deemed inappropriate for use in this study. Therefore, a cross-sectional research design is deemed most fitting for this study, given the requirements of this study as set out in the previously.

Lastly, quantitative research on organisational improvisation can be considered novel in management literature. Previous research has largely been focused on theoretical and conceptual studies (*e.g.* Weick, 1993 and 1998; Eisenhardt and Tabrizi, 1995; Ciborra, 1996; Orlikowski, 1996; Hatch, 1997; Barret, 1998; Crossan and Sorrenti, 1998; Kamoche and Cunha, 1998). The lack of empirical research found in organisational improvisation (*e.g.* survey study as depicted in Table 4-3) may limit the generalisability on the findings of improvisational study and subsequently inhibit theory verification. Therefore, a cross sectional research design is deemed most fitting for this study as an extension for prior research.

4.4. Research Methodology

This section will outline and discuss the (1) sampling process, (2) primary data generation, (3) data collection design, (4) instrumentation, (5) response measurement, (6) survey design, (7) questionnaire validation process, (8) actual data collection process, and (9) data analysis to be used in this study.

4.4.1. The Sampling Process

One way to collect information on the variables that need to be tested would be to collect information from each member of the defined population. But, this would be impractical, difficult and resource intensive. The sampling method can be used to generalise the characteristics of the population elements (Sekaran, 1992) and to establish the generalisability of study results (Churchill, 1999). As indicated by Sekaran (1992), sampling is the process of selecting a sufficient number of elements from the population; and it is known as a subset of a defined population (Bryman and Bell, 2007). In the sampling process, some important elements that need to be considered include (1)

defining the population; (2) choosing an appropriate sampling frame, (3) selecting an appropriate sampling procedure, (4) determining the sample size, (5) selecting the sample elements, and (6) collecting the data from the designated elements (Churchill, 1999).

Step 1: Define the Population

Population, as indicated by Bryman and Bell (2007), is the universe of units from which a sample is to be selected, *“it consists of all units such as individual, households, or organisations to which one desires to generalise survey results”* (Dillman *et al.* 2007:42). The population of this study comprises the Chief Executive Officer (CEO) or Chief Operating Officer (COO) or managing director (nominated subordinate) of Malaysian high technology-based companies. The selection of high technology-based companies is motivated by the nature of the industry. Technology-based companies are progressively faced with the ongoing challenge of competition due to high environmental turbulence and the continuous rising of customer expectations (Morgan *et al.*, 2000; Doran and Gunn, 2002; Morgan and Strong, 2003); therefore there is likely to be a greater tendency toward improvisational activities and as such indicates this to be a very appropriate context for this research.

Indeed, there is an increasing awareness of the contribution of high technology sectors in Malaysia’s economy. High technology-based companies in Malaysia have been chosen as the study sample because these companies are considered to be operating in highly turbulent environments. The tendency for these companies to improvise is therefore potentially higher. Undeniably, the high technology-based sector has increasingly grown to become a major player for Malaysia’s economy. In response to this, high technology-based sectors have constantly been highlighted and encouraged by the Malaysia Plan and Malaysia budget’s emphasis on stimulating research

and development (R&D) and the commercialisation effort (Mat Zin and Talet, 2007). For example, the Eighth Malaysia Plan (2001-2005) shows an increase of budget allocation for R&D and commercialisation of technology based industries, specifically in information and communication technology (ICT) and applied science and technology registered progressive increments in R&D activities (MASTIC, 2008; Othman, 2009); whilst in the Ninth Malaysia Plan (2006-2010), the government has focused on strengthening the development of high technology and production of higher value-added products. According to the Economic Planning Unit (2006), extensive funds has been provided to the areas of high technology-based sectors such as advanced manufacturing technology (*e.g.* robotics, intelligence software, smart sensors, high-tech packaging, automation and nano-processing), and advanced materials from petrol chemical, automotive, biotechnology, and electric/electronic industries. The development on some specific projects have also been designed such as the development of ICT and Multimedia Super Corridor (MSC) projects (in Malaysia Budget 1999), the research and development on biotechnology sector (in Malaysia Budget 2006), the commercialisation on electronics manufacturing services (in Malaysia Budget 2006), and the latest is the development on green technology projects (in Malaysia Budget 2010). It is hoped in the later years that Malaysia can position itself as a technology provider in key strategic knowledge industries such as biotechnology, information and communication technology (ICT), microelectronics, advanced manufacturing, pharmaceuticals, nanotechnology, aerospace and photonics (MASTIC, 2006; Othman, 2009).

The importance of the abovementioned industries is not only limited to the technological contribution (R&D) to the nation but also to the national employment rate. These industries are currently serving about half of the

country's 10 million jobs in Malaysia which are based on high-value industries including information technology, healthcare and business process outsourcing (Gross and Minot, 2007); therefore it is seen as one of the major contributor to the number of job vacancies in Malaysia. To the best of the author's knowledge, a study on Malaysian high technology-based companies and its relationships to organisational improvisation and performance effect is not to be found. The significant contribution of industrial knowledge via R&D activities as well as the enormous employment opportunities created within the aforementioned industries has therefore justified the selection of companies as sample in this study.

Almost all research on improvisation thus far is exclusive to the United States in their research setting. As such, what we currently know of improvisation can be generalised to US companies and other closely related western countries such as the United Kingdom but it does not necessarily stand to reason that these findings directly generalise to eastern companies or indeed do the results of past studies still stand in eastern companies? By noting an absence of investigation companies in eastern parts of the world and on Malaysian high technology-based companies and more specifically, the organisational improvisation and performance effect (*see* Table 4-3 on a sample of previous quantitative studies (survey method) of organisational improvisation), the significance of selecting these types of companies as a target population is essentially favourable.

**TABLE 4-3: A SAMPLE OF PREVIOUS STUDIES ON
ORGANISATIONAL IMPROVISATION**

Authors	Year	Sector/ Company as a sample
D Aram and Walochik	1997	Managers, management consultants, management instructors and organizational participants at middle and upper management levels of Spanish organization.
Moorman and Miner	1998(b)	Developer of electronic instruments and manufacturer from food products
Cunha and Cunha	2001	Virtual multinational new product development team, working with R&D consortium in the mould industry.
Baker, Miner and Eesley	2002	Founders and senior managers from computer training and air pollution consulting industries
Akgun, Lynn and Yilmaz	2002, 2005, 2007	Project managers, department managers and directors from a variety of technology-based company in north-east of USA
Leybourne and Sadler-Smith	2006	Practitioners, consultants, project managers who engaged in project-based change initiatives within the UK financial services sector
Leybourne	2006	UK financial service sector
Hmieleski and Corbett	2006	Entrepreneurs from new ventures companies

Step 2: Choose the Sampling Frame

A sampling frame is a list of all units in the population from which a sample can be taken (Churchill, 1999; Bryman and Bell, 2007). It also refers to the sample of units about which information is to be obtained (Churchill, 1999). Hague and Harris (1993) characterised a good sampling frame, which should (1) contain a list of members of defined population; (2) be complete and up-to-date; (3) not include multiple listings of population members; and (4) contain information about each unit that could be used to stratify the sample. This study requires a comprehensive list of high technology-based companies in Malaysia. Unfortunately, these technology-based companies are not included in a single directory; therefore it impedes the process of selecting the right sampling frame. Due to this, it is necessary for the researcher to obtain a number of databases, which are inclusive of high technology-based companies, as a sample frame for this study. Prior to this, the understanding

of the concepts and characteristics of high technology sectors is needed in selecting the right sample for this study.

Understanding the concepts and characteristics of high technology-based products or services

Many constituencies such as academicians, public policy makers, stock market analysts and investors are interested in high technology firms but unfortunately, there is still relatively little clarity in the definition of 'high technology' (Morgan and Strong, 2003). For instance, when 'high technology' is defined as the number of submitted patents for a product, then the most high technology product in the world is baby nappies (Parker-Pope, 1999). Up until now, there is no absolute definition of high technology because technology shifts rapidly over time. Advanced or high technology today could change to medium or low technology within five or ten years from now. That is, innovative technologies now simply become standard over time. For example, computer, digital camera, printer scanner, airbags in the car and so forth.

Rexroad (1983) identifies high technologies as "*the segment of technology considered to be nearer to the leading edge or the state-of-the-art of particular field*" (p.3). It is that technology inherent in emerging from the laboratory into practical application. According to Grunenwald and Vernon (1988), they define high technology products and services as those devices, procedures, processes, techniques, or sciences that are characterized by high research and development and have typically short and volatile lives. On the other hand, Samili and Wills (1986) suggest that high technology is a group of industries that stretches beyond electric computers to a variety of research industries such as biotechnology, pharmaceutical, chemical and aerospace. High technology can be defined in relation to the characteristics or features of

companies. It is characterized as fast-changing, uncertain and dynamic (Hughes and Morgan, 2007); riskiness, well-populated with engineers, shorter product life cycle (Riggs, 1983) and a strong R&D background (Dhanani *et al.*, 1997). Badarulzaman (1998) states most research has highlighted the two important criteria in defining high-tech industry. These criteria are (1) the proportion of professional workers to the total workers working in the firm and (2) the percentage of expenditures on research and development (R&D) activities to the total expenditures of the firm.

There are a number of formal approaches characterising high technology sectors. The Organisation for Economic Co-operation and Development (OECD) criterion and Standard Industrial Classification (SIC) codes by Butchart (1987) for instance, are mainly used by government, industries as well as researchers as an indicator of identifying on the high technology sectors. The Organisation for Economic Co-operation and Development (OECD) criterion is based on R&D to sales ratio of more than 4% (Morgan and Strong, 2003) and the classification of industrial sectors (SIC) is based on the sector with above average R&D intensity and above average proportion of scientists, professional engineers and technician in the labour force (Jones-Evans and Westhead, 1996). It is relatively similar with criteria prepared by Lester A. Davis, an economist with the Office of Trade and Investment Analysis, International Trade Administration, U.S. Department of Commerce, 1982 (Traynor and Traynor, 2004); which listed the top ten high technology sectors is rooted in total R&D expenditure. The criterions from the three different approaches are as illustrated in Table 4-4.

TABLE 4-4: CRITERIA OF HIGH TECHNOLOGY PRODUCTS AND SERVICES FROM THREE DIFFERENT APPROACHES

Type of High Technology products and services	OECD CRITERION	SIC CODE (by Butchart, 1987)	Traynor and Traynor (2004) Criterion
Guided missiles and spacecraft	√	√	√
Communication equipment and electronic equipment		√	√
Aircraft and parts		√	√
Office computing and accounting / business machines	√	√	√
Ordinance and accessories			√
Drugs and medicines / Pharmaceutical	√	√	√
Industrial inorganic chemicals		√	√
Professional and scientific instruments	√		√
Engines and turbines and parts			√
Plastic materials and synthetic resins, rubber, and fibres		√	√
Electrical and electronic	√	√	
Computer		√	
Medical and surgical equipment	√	√	
Optical instrument	√	√	
Photographic and cinematographic equipment	√	√	
telecommunications	√	√	
Research & Development		√	
High tech manufacturing and services		√	

The classification and criterion of high technology companies still remains inconclusive. The standard industrial classification (SIC) sectors by Butchart (1987) for example, has some drawbacks because he has counted the sectors only for 'product-based' rather than 'process-based' firms such as those engaged in the biotechnology industry, which is recognized as an innovative industry with highly technological applications across a broad range of products and processes from traditional industries (brewing sector) to the more advanced industries (pharmaceutical sector) (Jones-Evans and

Westhead, 1996). This is the same case as nappies, which could be considered as high tech products due to their heavily patented nature (Parker-Pope, 1999).

A liberal interpretation of high technology which typically involves firms characterised by rapid product innovation is critically important in defining the high technology sector (Morgan and Strong, 2003). Exploitation of frequent new technologies in production processes, a high level of technical and scientific expertise necessary for operations, and above average R&D intensity are among the criteria that can be used as a characterisation of high technology products and/or services sector (Morgan and Strong, 2003; Hughes and Morgan, 2008).

A Choice of high technology-based companies in Malaysia as a sample study

Once the implicit knowledge of the characteristics of high technology sectors are understood, a list of companies meeting the criteria of high technology-based products/services was developed by using all relevant resources from OECD criterion; SIC codes and other previous studies. A list of companies was gathered from Federation of Malaysian Manufacturer (FMM) directory, Malaysia Biotek Corporation Sdn Bhd directory, MSC Status directory and MESDAQ directory.

The Federation of Malaysia Manufacturer (FMM) directory is one of directory to be listed in this sample study. FMM is the largest private sector economic organisation in Malaysia. FMM has officially recognised and consistently led Malaysian manufacturers in spearheading the nation's growth and modernisation. It represents over 2,000 manufacturing and industrial service companies from different types, sectors and sizes. Since this study focuses on high technology-based products and services, the whole company list comprising the FMM directory cannot be used within the

sample; rather, the companies which specifically relate to high technology-based are only selected as part of the sampling process. Therefore, the researcher has to identify and pick the correct classification of products/services or sectors within the whole FMM directory. The final selection of type of products and services from the FMM directory which can be considered as representing high technology in nature is illustrated in Table 4-5.

The second directory chosen as sample of this study is coming from companies with Multimedia Super Corridor (MSC) status. Multimedia Super Corridor (MSC) Malaysia is a flagship program made by the government of Malaysia as a support system for technology based enterprises in Malaysia (Mohan, 2006). Those companies awarded with MSC status are mainly engaged with high tech based in nature. Currently, this status is awarded to 3 types of business entities namely companies, incubators and institutes of higher learning (IHLs), each with different application criteria and guidelines. However, not all entities are to be used for this study. Only privately held companies are selected as sample of this study rather than other two types of business entities (incubators and higher learning). The decisions are mainly due to the examination of company's ownership and management structure. Most incubator entities and higher learning institutions are wholly-owned by semi-government scheme. Therefore the improvisational activities and the effect of environmental turbulence to both entities (incubators and IHLs) are possibly varied from privately owned business entities; and to avoid sampling bias, these two entities are not counted in the sampling frame.

The third chosen directory is obtained from a list of Malaysia biotechnology companies. This sector is selected as a sample due to its highly technological features; and is set to become one of a new platform of

economic growth to poise for the new achievement of Malaysia high technology industry. This list of biotechnology companies is acquired from Malaysia Biotechnology Corporation. The Biotechnology Corporation acts as a one-stop-centre which nurture and accelerate growth of Malaysian biotechnology companies, and promote actively on foreign direct investments in biotechnology. This corporation is under the Ministry of Science, Technology and Innovation (MOSTI) and is wholly-owned by the Ministry of Finance Incorporated; therefore the provided company directory is significantly reliable and to be used as a sample study.

The last directory chosen as a sampling frame for this study is obtained from MESDAQ list of companies. MESDAQ (Malaysian Exchange of Securities Dealing & Automated Quotation) is a separate market for technology based companies listing. MESDAQ market is listed under KLSE (Kuala Lumpur Stock Exchange), Malaysia. The principal objective of MESDAQ market is to provide an avenue for high-growth companies to raise capital and to promote technology intensive industries and hence assist in developing a science and technology base for Malaysia through indigenous research development. Due to the fact that all companies in the MESDAQ list are high technology based, hence the list of all 85 companies are included in this study.

The list from four different directories are listed and compiled to make one list of directory of Malaysia technology-based companies. To be noted again, not all companies from each directory are selected. Only relevant companies with the characteristics of high technology based products or services are considered to be the sample study. Table 4-5 below demonstrates four directories with the selection of technology-based products or services. The redundancies of address of some companies are then checked. For

example, some companies listed under FMM are also awarded and listed under MSC status directory. This identification of redundancy of sample address is important in order to ensure the accuracy of sampling frame.

TABLE 4-5: SAMPLING FRAME OF FOUR DIRECTORIES AND SELECTION OF PRODUCTS/SERVICES

Directory	Selection of technology-based products/services
Federation of Malaysia Manufacturers (FMM)	chemical products baby products computer products adhesive/plastic material products cosmetic products pharmaceutical products electronic products electrical products machinery products aircraft manufacturing products communication and electronic equipment telecommunications research and development biotechnology product and services
Multimedia Super Corridor (MSC) Status Company	software development creative multimedia Internet based businesses hardware design
MESDAQ Company	All the list of companies from MESDAQ, KLSE
Biotechnology Company	All the list of companies from Biotechnology Corporation directory

Step 3: Select a sampling procedure

Selecting a sampling procedure is intertwined with the identification of the sampling frame (Churchill, 1999). The choice of sampling methods depends solely on what the researcher can develop for a sampling frame (Churchill, 1999). Due to the limited availability of a comprehensive and updated list of high technology-based companies in Malaysia, this study used the whole population as a sampling frame.

Step 4 and Step 5: Determine the sample size and select the sample elements

After confirming the sampling frame and procedure, the researcher needs to determine the sample size of the study. The sample size refers to the number of units or the sample elements that need to be surveyed to get precise and reliable findings (Fink, 1995). The compilation of four different directories to one database, comprising a total of 1080 companies, is finalised as the study sample. The number of selected companies taken from each directory is illustrated in Table 4-6.

TABLE 4-6: NUMBER OF SAMPLE OF EACH DIRECTORY

Directory	Number of Company as sample
Federation of Malaysia Manufacturers (FMM)	392
Biotechnology Company	103
MESDAQ Company	85
Multimedia Super Corridor (MSC) Status Company	500
Total	1080

Step 6: Collect the data from the designated elements

Data generation needs to be purposefully defined in order to satisfactorily achieve the research objective and hypotheses of this study. The details of data generation and the data collection process will be discussed in the following sections.

4.4.2. Data Generation

After determining the research design for this study, it is essential to consider approaches to data generation (Churchill, 1999). Data can be classified as two types, primary data or secondary data. Primary data is new data collected directly by the researcher in order to achieve specific purposes of the study (Tull and Hawkins, 1993). It can be obtained through experiment or through survey approaches. In social science research, primary data is often used to test research hypotheses (Churchill, 1999; Dillman, 2000).

Primary data can be considered as unbiased information as the data is coming directly from the original source, or primary market or the direct population of the study. The advantage of this is identified in terms of viability of the data source. Other several advantages to primary data collection are based on the flexibility and confidentiality of the data. The process of collecting primary data is relatively flexible because the researcher can set certain controls in place to ensure that the data collected are reliable; and this primary data collection strategy can be tailored specifically to answer a precise research question. Further, the confidentiality and privacy of certain information from the respondents or responding companies can be maintained.

Secondary data in contrast, is described as having previously been gathered by someone other than the researcher and / or collected for some purpose other than the research project at hand (Burns and Bush, 2006). Most secondary data are already published and they can be obtained from past studies or through a population census, or material that have already been recorded or published (Tull and Hawkins, 1993) such as newspaper articles, company reports, past interviews and so forth (Yin, 1994). Secondary data sources are often used for building case studies (Yin, 1994; Stake, 1995). It can save both time and cost, and serve an opportunity for longitudinal studies and a cross-cultural analysis (Bryman and Bell, 2007). However, secondary data can have some disadvantages. As indicated by Bryman and Bell (2007), lack of familiarity and complexity of data which can limit the researcher's ability to explore that data (Bryman and Bell, 2007). It may also consume substantial time to become familiar with such data, especially complex secondary data. Another limitation is that secondary data can be biased by the original researcher, interviewee, reporter and so forth which may be

unknown to the researcher of the present study (Yin, 1994; Stake, 1995). Further, studies that rely solely on secondary data sources, for instance archival data, may have limits or no data on key variables (Bryman and Bell, 2007), hence it may hamper the conclusions of the study.

By considering the disadvantages of employing secondary data sources and given that there were no secondary sources of data readily available or of satisfactory quality to meet the data requirements needed to test the thesis hypotheses, this study requires the generation of primary data. The generation of primary data is seen as imperative for this study in order to satisfactorily meet the research questions of this study, as well as to investigate the accuracy of the thesis hypotheses. Primary data can derive from many different sources, including surveys or questionnaires (*e.g.*, mailings, telephone interviews, face-to-face interviews), observations (*e.g.*, focus groups, participant observation), or through instrumentation (*e.g.*, physiologic measures) (Nicoll and Beyea, 1999). This study adopted a quantitative research strategy, therefore only survey questionnaires were considered as a data collection approach for this study.

4.4.3. Data Collection

There are a number of techniques in collecting primary data that need to be considered. Traditionally, as proposed by Churchill (1999), there are three methods of surveying a large number of respondents via a questionnaire. These are (1) personal interviews, (2) telephone interviews, and (3) postal questionnaire. However, there is now a fourth category of Internet or emailed questionnaires (Dillman, 2000; Curasi, 2001). Table 4-7 outlines each type of survey methodology and provides advantages and disadvantages of each in turn.

As shown in Table 4-7, each survey instrument has its own inherent benefits and limitations. To reach a conclusion as to which instrument to deploy for the survey, several important criteria of each type of survey methodology need to be considered such as (1) methodological and delivery considerations; (2) resource considerations; and (2) response rate considerations. For instance, personal interviews and telephone interviews require a great degree of skill and technical expertise on behalf of the interviewer to avoid biasing results. The cost of hiring technical expertise to limit this and the problems associated with world time differences and the work schedule of the intended respondents, it is discarded as a survey method to be used in this study. Regarding internet or emailed questionnaire, though the benefits of such an approach are relatively similar to that of a postal questionnaire, the inability to obtain a specific email addresses for respondents suggests that this type of survey could not be effectively implemented in this study. Moreover, given the time constraints of most top managers, an emailed questionnaire may be promptly deleted.

By investigating all considerations of each survey instrument, the survey instrument used in this study is the postal questionnaire. This instrument has been chosen given the ability to pre-test the questionnaire to ensure the measurement items and scales are valid, the relatively low costs, the reduced possibility for biased results in not having an interviewer, and the possibility to employ Dillman's (2000) recommendations to obtain a satisfactory response rate.

TABLE 4-7: ASSESMENT OF SURVEY METHODOLOGIES

Method	Advantages	Disadvantages	Typical Response Rate	References
Mailed Questionnaire	<ul style="list-style-type: none"> • Cheap to administer • Flexible and quicker – respondents can answer questions in any order. • Can contain as much questions as the researcher wants to ask. • Questionnaire can be pre-tested and changed before being administered. • Questionnaires can now be optically scanned to reduce data input time. • Visual aids can be used. • Useful when interviews are inappropriate or impossible. • Postal questionnaires are not subject to interviewer bias – absence of interviewer effects and no interviewer variability 	<ul style="list-style-type: none"> • Cannot be quick or on time to gather the data • Cannot make greater explanation to the respondents on some questions. • Greater risk of missing data. • Lead to bias results due to:- • Respondents tend to be abruptly answered or not answered at all on the open-ended questions • Misinterpret wording • Misinterpret measurement scales • Respondent responses according to the view of entire questions. • Cannot collect additional data. • Difficult to ask a lot of questions • Lower response rates – especially when provided with long questionnaire. 	Low	Churchill (1999); Dillman <i>et al.</i> (2007) Bryman and Bell (2007)

Internet / Email Questionnaire	<ul style="list-style-type: none"> • Very cheap to administer • Flexible and quicker – respondents can answer questions in any order. • Can contain as much questions as the researcher wants to ask. • Questionnaire can be pre-tested and changed before being administered. • Questionnaires can now be optically scanned to reduce data input time. • Visual aids can be used. • Useful when interviews are inappropriate or impossible. • Postal questionnaires are not subject to interviewer bias – absence of interviewer effects and no interviewer variability • Data can be automatically input into a statistics package such as SPSS by a code in the Internet page containing the questionnaire 	<ul style="list-style-type: none"> • Cannot be quick or on time to gather the data • Cannot make greater explanation to the respondents on some questions. • Greater risk of missing data. • Lead to bias results due to:- • Respondents tend to be abruptly answered or not answered at all on the open-ended questions • Misinterpret wording • Misinterpret measurement scales • Respondent responses according to the view of entire questions. • Cannot collect additional data. • Difficult to ask a lot of questions • Lower response rates – especially when provided with long questionnaire. • Measurement scales must be well developed. • The ‘spam’ effect – people may believe an email to be junk mail and promptly delete it. 	Low	Dillman (2000) Dillman <i>et al.</i> (2007); Bryman and Bell (2007)
--------------------------------------	--	--	-----	---

Telephone interview	<ul style="list-style-type: none"> • Questions can be asked with greater success especially on open ended questions. • Useful for geographically disperse populations. • Complex and ambiguity questions can be clarified. • Order of questions can be controlled. • Calls can be recorded. • Relatively quick to generate large amounts of data. • Relatively flexible because sequence of questions can be changed easily and quickly. 	<ul style="list-style-type: none"> • Slightly expensive compared to mailed/emailed questionnaires • Time constraints :- • the willingness of respondents to stay on the phone. • calls can only be made during office hour or day time • top managers tend to be tied up in meetings. • Cannot use visual aids. • Data input and analysis can take a long time relative to other methods. • Subject to some interviewer bias. 	High	Churchill (1999) Dillman <i>et al.</i> , 2007)
Personal interview	<ul style="list-style-type: none"> • Questions can be flexibly delivered and administered – <i>e.g.</i> can be structured interview on the high street • Complex questions and ambiguities can be thoroughly explained by the interviewer. • Any type of question can be asked. 	<ul style="list-style-type: none"> • Very expensive. • Quality of responses depends on the skills of the interviewer. • Bias results – respondents may tend to response according to what they think the interviewer wants. • Taking too much time during the interview may decrease 	High	Churchill (1999) Bryman and Bell (2007)

	<ul style="list-style-type: none">• Questionnaire can be pre-tested and changed before being administered.• Order of questions can be controlled.• Visual aids can be used.• Longer time can be taken with respondents.	concentration and interest from respondents.		
--	--	--	--	--

4.4.4. Instrumentation

The generation of data for this study is solely obtained from primary data collection. By using a questionnaire, respondents were asked questions which relate to the tested variables. All instruments of each variable were adapted from previous studies except the items for manager's self-confidence. The items for manager's self-confidence and improvisation were to be found none for empirical research. Therefore, the researcher needs to make her own construct in order to measure the degree of manager's self confidence in improvisational setting. The adapted items were based on high reliability coefficients of each item measure in previous research. The details of constructed and adapted items of each variable can be seen in Table 4-8.

Seven items were used to construct organisational improvisation. Referring to the definition of organisational improvisation (*see* Chapter 2 for details) this research agreed to adapt the conceptual understanding of organisational improvisation from Vera and Crossan (2005), thus all measurement items of organisational improvisation were adapted from Vera and Crossan (2005). Four items load as a creativity scale and the remaining three items load as a spontaneity facet. These items have their own meanings with the analysis to evaluate the validity of the multi-item measures.

For the reasoning factor, measures of rational and intuitive reasoning were adapted from the Rational-Experiential Inventory (REI) developed by Eipstein *et al.* (1996) and Leybourne and Sadler-Smith (2006). The REI Inventory was used due to its high reliability of item-scale highlighted in previous research. The REI inventory is a thirty two item-scale; nineteen measure rational reasoning and the other twelve measure characteristics of intuitive facets. However, the inclusion of all thirty two items in this study could result in a lengthy questionnaire, which can affect the response rate.

The screening and elimination of some items which have similar meaning and may be confusing to respondents (due to psychological jargon) has been made. It should be noted that not all respondents are familiarised with psychological terms and in order to avoid misinterpretation, those 'jargon' items have been eliminated. The final adapted items from this REI inventory were twenty items; fourteen items measuring rational reasoning and the remaining six-items measuring intuitive reasoning.

With regards to measuring the managerial characteristics, a four-item scale for manager's self-confidence was developed by the researcher. These items were constructed based on the conceptual understanding of the meaning of self confidence in the context of an organisational improvisational setting. The reliability and validity is important to be tested in these measures since they were the initial measures to be tested for manager's self-confidence. But this is not the same case as the measurement items of manager's expertise and attitude towards risk. All items from both variables were adapted from previous research. To evaluate the manager's expertise, a three-item scale was adapted from Vera and Crossan (2005); for manager's attitude towards risk factor, three items were adapted from McKibbon *et al.* (2007). It is important to note that the manager's attitude towards risk is distinguishable from organisational risk taking. Different measures were used to evaluate organisational risk taking, which were adapted from Singh (1986). The adapted measures to be used in this study are presented in Table 4-8.

Next, the identification of measures for organisational factors are discussed. The organisational factors include goal clarity, organisational structure, organisational flexibility, risk taking (as discussed earlier), real time information and organisational memory, which were used to examine their effect on organisational improvisation. To evaluate organisational goal clarity,

a three-item scale was adapted from Akgun and Lynn (2002). These items measure the clarity of overall business goals, target market and the clarity of customer's needs and wants. Meanwhile, the six measurement items for organisational structure were adapted from Auh and Menguc (2007). From these six items, four items describe centralised decision making which was originally taken from Jaworski and Kohli (1993); and the other two items characterise the degree of formalisation was originally developed by Deshpandé and Zaltman (1982). The measurement scale for organisational flexibility was based on nine items adapted from Jones *et al.* (2006) and four items adapted from Krohmer *et al.* (2002). This flexibility item-scale was developed based on the descriptions of extracted components of proclivity, adaptability, resilience, and general flexibility meanings (Jones *et al.*, 2006).

With regards to evaluating information processing, two variables are used – organisational information and organisational memory. The measures of both variables were adapted from Vera and Crossan's (2005) work. The use of measures from Vera and Crossan (2005) were specific to an 'improvisational setting' and therefore the researcher was not required to adapt the structure or wordings of the item measures. There were four items for both real-time information and organisational memory respectively (*see* Table 4-8 for details).

In evaluating the environmental turbulence, the technological, market and competitive turbulence scales were adapted from Jaworski and Kohli (1992); Moorman and Miner (1997) and Akgun *et al.* (2007). A four-item scale represents technological turbulence, a three-item scale for market turbulence facets; and a five-item scale for competitive turbulence. The adapted items from previous research all recorded high reliability coefficients of above 0.7.

The final scale that required development is the firm performance measurement. Substantial previous research has viewed firm performance as the principal dependent variable in strategic management research (Gilley *et al.*, 2002). Due to the issue of confidentiality and privacy in obtaining actual financial and market performance data from companies, the measurement of organisational performance adopted existing questions which reflected financial and market-based indicators of performance. Accordingly, the following perceptual measures were used to capture the firm performance are as follow: profitability; sales growth; financial resources (liquidity and investment capacity); public image; and client loyalty. These measures have been used effectively by Chakravarthy (1986), Venkatraman and Ramanujam (1986), Day and Nedungadi (1994), Covin *et al.* (1997), Rogers *et al.* (1999); Brews and Hunt, (1999), Morgan and Strong (2003), Slotegraaf *et al.* (2004) and O'Regan and Ghobadian (2004). The adoption of the measures is based on the reliability and validity of the measures established by previous studies.

TABLE 4-8: VARIABLES, ITEM MEASURES AND SOURCES OF ITEMS

Variable	Items	Source of adapted items
Organisational improvisation	<ol style="list-style-type: none"> 1. deal with unanticipated events on the spot. 2. think on my feet when carrying out actions. 3. respond in the moment to unexpected problems. 4. try new approaches to problems. 5. take risks in terms of producing new ideas in doing the job. 6. demonstrate originality in my work. 7. identify opportunities for new work process. 	Vera and Crossan, 2005
<i>Managerial Factors</i>		
Rational reasoning	<ol style="list-style-type: none"> 1. rather do something that requires little thought than something that is sure to challenge my thinking abilities. (R) 2. don't like to handle a situation that requires a lot of thinking. (R) 3. prefer complex to simple problems. 4. little satisfaction in deliberating hard and for long hours. (R) 	REI Inventory, Eipstein <i>et al.</i> , 1996; Leybourne and Sadler-Smith, 2006

	<ol style="list-style-type: none">5. thinking is not my idea of fun. (R)6. the notion of thinking abstractly is not appealing to me. (R)7. simply knowing the answer rather than understanding the reasons for the answer to a problem is fine with me. (R)8. don't reason well under pressure. (R)9. the idea of relying on thought to make my way to the top does not appeal to me. (R)10. learning new ways to think doesn't excite me very much. (R)11. prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.12. prefer to accept things as they are rather than to question them. (R)13. enough to get the job done; I don't care how or why it works. (R)14. difficulty thinking in new and unfamiliar situations. (R)	
--	---	--

Intuitive Reasoning	<ol style="list-style-type: none"> 1. initial impressions of situations are almost always right. 2. trust my initial feelings about decisions. 3. believe in trusting my hunches on decisions. 4. very intuitive person. 5. often have clear visual images of things. 6. good at visualizing things. 	REI Inventory, Eipstein <i>et al.</i> , 1996; Leybourne and Sadler-Smith, 2006
Manager's self confidence	<p>How confident you are that you will be able to:</p> <ol style="list-style-type: none"> 1. make a strategic plan and execute it at the same time. 2. engage in spontaneous actions to create strategy within time pressures. 3. make intuitive judgments for taking actions. 4. improvise when the firm is faced with high levels of uncertainty in turbulent markets. 	Researcher's own construct
Manager's expertise	<ol style="list-style-type: none"> 1. I am aware of the critical managerial issues that affect my work. 2. I am current and knowledgeable about my field of work. 3. I have knowledge in diverse fields. 	Vera and Crossan, 2005

Manager's attitude towards risk	<ol style="list-style-type: none"> 1. I enjoy taking risks. 2. I try to avoid situations that have uncertain outcomes. 3. taking risks does not bother me if the potential gains are high. 4. I consider security an important element in every aspect of my life. 5. people have told me that I seem to enjoy taking risks. 6. I rarely, if ever, take risks when there is an alternative. 	McKibbon <i>et al.</i> , 2007
<i>Organisational Factors</i>		
Goal clarity	<ol style="list-style-type: none"> 1. a clear vision of the target market (user). 2. a clear understanding of target customers' needs and wants. 3. The overall business goals are clear. 	Akgun and Lynn, 2002
Organisational structure	<ol style="list-style-type: none"> 1. There can be little action taken in the organization until a superior makes a decision. 2. A person who wants to make his/her own decisions would be quickly discouraged in the organisation. 3. Even small matters have to be referred to someone with more authority for a final decision. 	Deshpandé and Zaltman, 1982; Jawoski and Kohli, 1993; Auh and Menguc, 2007

	<ol style="list-style-type: none"> 4. Any decision a person in the organisation makes has to have his/her boss's approval. 5. Most people in the organisation follow written work rules for their job. 6. How things are done in the organisation is never left up to the person doing the work. 	
Organisational flexibility	<ol style="list-style-type: none"> 1. explored a wide variety of approaches to a problem. 2. planned ahead rather than reacted to a situation. 3. created multiple courses of action during planning. 4. adjusted well to new equipment, process, or procedures in your tasks. 5. been able to adapt your personal approach to the situation at hand. 6. coped with stressful events effectively. 7. maintained productivity in challenging circumstances. 8. adapted to change with minimal stress. 9. given your work context would consider yourself to be a flexible person. 10. adapted your company strategy adequately to changes in the business environment of your 	Krohmer <i>et al.</i> , 2002; Jones <i>et al.</i> , 2006

	<p>organisation?</p> <ol style="list-style-type: none"> 11. adapted your company strategy adequately to changes in competitors' product-market strategies? 12. adapted your company strategy quickly to the changing needs of customers? 13. reacted quickly to new product-market threats? (R) 	
Organisational risk taking	<ol style="list-style-type: none"> 1. heavy reliance on innovation 2. high debt financing 3. heavy R&D 4. high risk, high return investments 	Singh, 1986
Real-time information	<ol style="list-style-type: none"> 1. up-to-date information through meetings 2. Readily shared information within organization 3. Receive information about other departments' activities 4. information on external environment 	Vera and Crossan, 2005
Organisational memory	<ol style="list-style-type: none"> 1. keep records of past projects 2. information systems to support work 3. up-to-date files and databases 4. well-defined procedures 	Vera and Crossan, 2005

<i>Moderating Variables</i>		
Technological turbulence	<ol style="list-style-type: none"> 1. The technology used in our industry is changing rapidly. 2. The technology that is relevant to our market is changing rapidly. 3. A large number of new product ideas have been made possible through technological breakthroughs in the industry. 4. Technological changes provided big opportunities in the industry. 	Jawoski and Kohli, 1993; Moorman and Miner, 1997; Akgun <i>et al.</i> , 2007
Market turbulence	<ol style="list-style-type: none"> 1. Customers' preferences change quite a bit over the time. 2. Our customers tend to look for new products all the time. 3. We witness demand for our products and services from customers who never bought them before. 	Jawoski and Kohli, 1993; Moorman and Miner, 1997; Akgun <i>et al.</i> , 2007
Competitive turbulence	<ol style="list-style-type: none"> 1. Competition in our industry is cut-throat. 2. There are many 'promotion wars' in our industry. 	Jawoski and Kohli, 1993; Moorman and Miner, 1997; Akgun <i>et al.</i> , 2007

	<ol style="list-style-type: none"> 3. Anything that one competitor can offer, others can match readily 4. Price competition is a hallmark of our industry. 5. One hears of a new competitive move almost every day. 6. Our competitors are relatively weak. 	
<i>Dependent Variable</i>		
Firm performance	<ol style="list-style-type: none"> 1. Long term profitability 2. Sales growth 3. Financial resources (liquidity and investment capacity) 4. Public image 5. Client loyalty 	<p>mixed of previous research by Chakravarthy (1986), Venkatraman and Ramanujam (1986), Day and Nedungadi (1994), Covin <i>et al.</i> (1997), Rogers <i>et al.</i> (1999); Brews and Hunt, (1999), Morgan and Strong (2003), Slotegraaf <i>et al.</i> (2004), O'Regan and Ghobadian (2004) and</p>

4.4.5. Response Measurement

Measurement of questions comprise of sets of rules governing the meaning of values assigned to entities (Bryman and Bell, 2007). Each such set of rules defines a scale of measurement. This "scale of measurement", developed by Stevens (1946) consists of four types of scales - nominal, ordinal, interval and ratio and each scale has its own characteristics (Meyers *et al.*, 2006).

A nominal scale is a non-quantitative scale by which numbers are assigned to attributes of objects or classes of objects exclusively based on the purpose of the identifications of the objects (Hair *et al.*, 1998; Bryman and Bell, 2007). Most variables assessed on a nominal scale are categorical variables. For example, respondent's sex, the type of sectors represented by responding companies and the current respondent's position in the company can be categorised as a nominal data.

An ordinal scale of measurement on the other hand, uses numbers exclusively (Hair *et al.* 1998). The numbers assigned to objects or events represent the rank ordering of entities; for example the number conveys 'less than' and 'more than' information. This research uses an ordinal scale to measure the years of respondent's experience, age of respondents, and the years of company's operation.

On interval measurement scales, one unit on the scale represents the same magnitude on the characteristic being measured across the whole range of the scale but the zero point is arbitrary (Hair *et al.*, 1999). Scores on an interval scale can be added and subtracted but it cannot be multiplied or

divided (Hair *et al.*, 1999). A highly familiar example of interval scale measurement is temperature with the Celsius scale.

As regards to a ratio scale, this measurement of scale has all the properties of nominal, ordinal, summative responses, and interval scales but includes one more important feature – an absolute zero. The ratio scale however has not been used in this study as there were no absolute objectives of the research which are suited to the characteristics of this scale.

A summative response scale requires respondents to assign values to entities based on an underlying continuum defined by the anchors on the scale. The numbers are ordered, typically in an ascending way, to reflect more of the property being rated. This type of scale is well known as 5-point scale or 7-point scale. The scale is a unidimensional scale method. The assessment of variables for this study adopts the 7-point scale. The scale applied in the questionnaire ranges from strongly disagree (1) to strongly agree (7); from not at all (1) to great extent (7); from very weak (1) to very strong (7); and from not at all confident (1) to very confident (7).

4.4.6. Survey Design

The aim of the questionnaire design is to develop a good quality questionnaire which can satisfactorily collate the necessary data to examine the research objectives and test the hypotheses of this study. At the same time, the design of the questionnaire must be easy to understand and attractive in order to engage the top managers of the targeted organisation to participate in answering the questionnaire. Therefore, the layout and format of the questionnaire must be well arranged because it can affect the quality of responses (Berdie *et al.*, 1986). A booklet type of questionnaire as suggested by Sudman and Bradburn (1982) and Dillman (2000) was used to design the

questionnaire. This booklet style looks more professional and easier for the respondent to follow and to turn the pages; and this style can also prevent the questionnaire from being lost or misplaced (Sudman and Bradburn, 1982). The questionnaire was printed on both sides of the pages to reduce the mailing costs. Thereon, the prescriptions of Dillman (2000) were followed for survey design. The questionnaire pack began with a cover letter, followed by the support letter from the Ministry of Science and Technology and Innovation (MOSTI), the detailed questions to capture each variable under examination, company information, personal information and any further comments from the respondents. A discussion of the structure of the survey approach follows next.

4.4.6.1. A Cover Letter

The personalised cover letter and address with the Loughborough University's headed paper were attached with the questionnaire. According to Dillman (2000), the personalised cover letter and address is one of the techniques available to increase questionnaire response rate. The cover page of the questionnaire highlights the purpose of the study, the necessary technique to answer the questionnaire, a promise of anonymity and confidentiality, a contact number and e-mail address of the researcher and an individual identification number at the bottom right hand corner of the page. The purpose of identification number is to eliminate respondents from the database so that repeat mailing would not occur.

For the first wave, a cover letter was posted to the respondents to inform them of the main objective of the questionnaire and the time it will reach them (see *Appendix 1*). Then after a few days, a second cover letter (see *Appendix 2*) was attached with cover page (see *Appendix 3*) and the

questionnaire (see *Appendix 4*) and posted to the respondents. For the final wave of data collection, the questionnaire was posted again to the respondents who did not reply to the questionnaire. The new cover letter was attached with the questionnaire (see *Appendix 5*).

4.4.6.2. An Endorsement Letter

An endorsement letter from the Ministry of High technology and Innovation (MOSTI) was attached after the cover letter. This endorsement letter hoped to increase the perceived significance of the questionnaire for not only the contribution to theories and practices, but also as a guideline to the Malaysia high technology-based industry. The example of an endorsement letter by MOSTI can be seen in *Appendix 6*.

4.4.6.3. A Pre-stamped Returned Envelope

A pre-stamped returned envelope was provided with each questionnaire to facilitate the mailing process. The researcher used the “Business Reply Service” from Pos Malaysia Berhad (Malaysia Post). A “Business Reply Service” is a prepaid reply envelope service. To adopt this service, the researcher is required to buy a licence number from the Malaysia Post and then write this licence number on the returned envelope; this service reduces the cost and time involved in survey administration, since the researcher does not have to attach the stamp on each returned envelope and at the same time can save the postage cost because it is only charged based on the number of replies received. This means that no postage stamp is needed for sending back the questionnaire, which can therefore indirectly heighten the response rate. An example of a returned envelope used can be seen in *Appendix 7*.

4.4.6.4. Reminder Letter

Two weeks after the original mailing, a postcard reminder was sent to all respondents. This reminder served as both a thank you for those who responded and as a well-mannered reminder for those who had yet to do so (see *Appendix 8*).

4.4.6.5. Questionnaire Content

The questionnaire consists of four sections within seven pages. *Section A* of the questionnaire consists of all questions related to independent and moderating variables of this study. These were segregated into ten main questions and each main question contained a number of sub-questions of item measures. All questions in this section are closed-ended questions with a 7-point scale.

Section B relates to the evaluation of the dependent variable (company performance). There were four open-ended questions and five closed-ended questions with a 7-point scale. The measures for company performance were specifically based on sales turnover, company's total asset, company profitability, financial resources, public image and client loyalty.

In *Section C*, three open-ended questions of company information were asked. This section is intended to acquire the information about number of employees, years of company's operation and industry or market that the company operates.

Section D seeks respondent information; such as the respondent's current position in that company; years of experience in that particular position, company and industry; respondent's sex and age; and respondent's level of education.

The last page of the questionnaire consists of another two additional questions and allows space for respondent's comments. The two additional questions are aimed at assessing the knowledge and accuracy with which the respondents believe that they have answered the questions. These two questions are to be used later in the analysis as a way to assess the validity of respondents. The respondents are also offered the opportunity to receive a free copy of the summary of the survey results. The details of the content in the questionnaire can be seen in *Appendix 4*.

The logo of Ministry of Higher Education and University Utara Malaysia were included on the last page of the questionnaire to acknowledge the sponsorship of this study.

4.4.7. Questionnaire Validation Process

The questionnaire design must be validated before the actual distribution of the self-administered questionnaire. The validation process is important in producing a high quality questionnaire design, specifically researcher's own constructs on items of manager's self-confidence. The words used, the organisation of questions asked and the scale of items used are some of the criteria that need to be taken into account in producing a good quality and validity of the questionnaire. Two ways for assessing the validity of questionnaire design were used in this study. The first is pre-testing through face validity from academics and practitioners; and then followed by a pilot study from managers of high technology-based companies.

4.4.7.1. Pre-Testing

The purpose of pretesting the questionnaire is to determine the wording in the questionnaire can be understood by the respondents in order to achieve desired results(Reynolds *et al.*, 1993; Bryman and Bell, 2007), the adequacy of

the instructions to respondents and the suitability of the structure of the questions (Bryman and Bell, 2007). In this study, a pre-testing was done before the actual distribution of the questionnaire (during February to April 2008). A pre-testing process was important in order to receive feedback and comments for the development of the questionnaire.

Pre-testing of the questionnaire was done involving three academics from Loughborough University, UK; five academics from Universiti Utara Malaysia, Malaysia; ten managers from private companies; and two top executives from corporate firms. The questionnaire was distributed so as to gain constructive feedback and some advices from them regarding issues such as the length of the questionnaire, the instructions and words used in the questions and so forth. The summary of feedbacks and comments were as follows:

- The questionnaire uses mainly management jargon. Technical management teams like engineers may not fully understand the meaning of some words within questions.
- The information of firm performance can be considered as private and confidential and it is hard to disclose to the public.
- Two respondents commented the length of the questionnaire. The length of the questionnaire was reasonable but they assumed that the shorter the questions, the greater the potential response rate.
- Instructions of each section in the questionnaire were understandable but it must be stated on every page of the questionnaire.

- The structure of the questions was well arranged and thus easier for the respondent to answer the questions.
- The font used in the questionnaire was good.
- The colour on the front page and the colour of the background of each section in the questionnaire was excellently design.
- The suitable of some words were questioned e.g., – “firm’ must be changed to ‘company’ to suit the business jargon in Malaysia.
- The language used in the questionnaire was understandable to a top management team who are involved in planning and decision making.

All the comments from respondents were taken into considerations for revision of the questionnaire. After made some changes on the questionnaire, a new questionnaire was then pretested again through pilot testing.

4.4.7.2. Pilot Testing

It is possible to conduct a pilot study prior to the actual administration of the self-completion questionnaire. Pilot studies can be crucial to identify potential areas of respondent confusion given that in a self-completion questionnaire the researcher is not present to clarify misunderstandings (Bryman and Bell, 2007). Thirty questionnaires were sent out to managers in high technology-based companies in Malaysia. This questionnaire was emailed to all thirty respondents. Ten respondents returned the questionnaire. There were no questionable matters or comments provided from them; and therefore, it is assumed that the overall impression of the questionnaire design was satisfactory. As a result, the questionnaire

remained the same. Please refer to *Appendix 4* to see the final version of the questionnaire of this study.

4.4.8. Actual Data Collection Process

Questionnaires were distributed to 1080 technology-based companies in Malaysia. Data collection was undertaken from 28 May 2008 until 1st September 2008. The data collection was divided into two phases, Phase 1 was started from 28th May 2008 until 15th August 2008; Phase 2 was started from 1st July 2008 until 15th September 2008. The execution of different phase was due to the development of new additional source of database from technology-based company which was obtained on 25th May 2008. This data for the second wave was obtained when the researcher went back to Malaysia.

Four waves of mailings were done in order to get a high response rate (as suggested by Dillman *et al.*, 2007).

Wave 1: A notification letter (see *Appendix 1*) was sent to

Phase 1: 580 recipients on 28th May 2008.

Phase 2: 500 recipients on 1st July 2008.

Wave 2: A cover letter (see *Appendix 2*) + questionnaire (see *Appendix 3*) and returned envelope (see *Appendix 5*) was mailed on

Phase 1: 10th June 2008.

Phase 2: 10th July 2008

Each questionnaire was stamped with an individual identification number so that follow up mailings can be sent to those not responding the earlier mailings.

Wave 3: A reminder letter (see *Appendix 7*) was sent out to all respondents who have not responded to return the questionnaire as soon as possible.

Phase 1: 30th June 2008.

Phase 2: 31st July 2008.

Wave 4: A cover letter (see *Appendix 4*) + a questionnaire (see *Appendix 3*) were sent out again to all respondents who still have not returned the questionnaire.

Phase 1: 1st August 2008.

Phase 2: 1st September 2008.

In the database, some companies have stated their email address and contact number. In this wave, the researcher sent a questionnaire to some respondents who provided their email address.

4.4.9. Data Analysis

The final requirement in developing the research design for this study is methodology used for data analysis. The purpose of data analysis is to obtain meaning from the collected data (Churchill, 1999) by analysing that data through a number of data analysis techniques. Several types of data analysis need to be used including univariate analysis techniques such as analysing descriptive statistics; bivariate correlation analysis and; multivariate techniques such as factor analysis and regression analysis (Hair *et al.*, 1998; Pallant, 2007, Bryman and Bell, 2007). A statistical package (SPSS version 16.0 for Windows) is used to analyse the data for this study.

4.4.9.1. Descriptive Analysis

This research uses descriptive analyses in order (1) to determine the basic characteristics of respondents and company respondents; and (2) to check any violation of the assumptions of tested variables. The descriptive analyses of profile of the responding companies comprising of respondents' response, type of industry, company size (according to number of employees and annual sales turnover); and, number of years the company has competed in the industry. Whilst, the profile of those survey respondents including respondents' educational background, age, gender, experience and position within their respective companies. This analysis is also used in detecting any violating of the assumptions made by the individual test (Pallant, 2007) such as the detection of outliers, normality and singularity of the data, and missing data. The descriptive analyses often involves statistical test for mean, standard deviation, range of scores, and skewness and kurtosis (Pallant, 2007). A 'Frequency', 'Descriptives' and 'Explores' are among the statistical techniques used for the descriptive analyses of this study. All the investigation on the descriptive analyses can be found in the next chapter (Chapter 5); as well as in Chapter 6 for the data screening.

4.4.9.2. Checking for Non-response Bias

Issues of non-response bias and key informant bias are also addressed as these affect the ability to generalise study findings to the defined population (Bryman, 2001). Non-response bias and key informant bias would also indicate problems with the sampling procedure and the reliability of the dataset. For example, this study comprises the compilation of all companies from four different directories, which totalled 1080 sample respondents. Different sectors with different sizes of companies could perhaps affect the reliability and generalisability of the study. As indicated by Armstrong and

Overton (1977), the sample should never be generalised without estimating the potential for bias. Hence, a test of non-response bias is necessary in order to ensure that these responses can be generalised and are representative for the population of this study (Armstrong and Overton, 1977). The test of non-response bias also enables the researcher to purify and analyze the data for the later stages of empirical analyses.

In this study, non-response bias was determined by examining whether there were significant statistical differences among the sectors (*e.g.*, Gilley *et al.*, 2002), company size (*e.g.*, Kalafsky, 2004) and respondents (*e.g.*, Armstrong and Overton, 1977). Company size was checked according to (1) total annual sales turnover; and (2) number of employees; whereas respondents' bias was checked through (1) examining respondents from phase 1 and phases 2; and, (2) CEO versus top managers.

To identify potential non-bias responses among respondents, an Independent Sample T-test analysis was conducted to check whether there was a significant different between means for the two set of scores (*e.g.*, first phase vs. second phase; CEO vs. top managers). Meanwhile, a one-way analysis of variance (ANOVA) was an appropriate test to be used in comparing the means of more than two groups. Therefore, this study used an ANOVA in identifying a significant bias among the sectors and company size. The detailed test of non-response bias is explained in Chapter 5.

4.4.9.3. Checking for Common Method Bias

A common method bias refers to "*variance that is attributable to measurement method rather than to the constructs the measure represent*" (Podsakoff *et al.*, 2003:879). This means that the bias might occur due the responses which are influenced by contextual factors and as a result fails to

obtain the respondent's true opinions. Due to this, Campbell and Fiske (1959) argue that one needs comparative methods to know whether there is such bias. According to Padsakoff and Organ (1986), a common method bias can be tested using Harman's one factor test, which is based on exploratory factor analysis. The details of the results is mentioned in Chapter 5; Section 5.5.

Another issue on respondents' bias relates to social desirability. Social desirability is "*the tendency of respondents to reply in a manner that will be viewed favourably by others*" (Kolarcik, *et al.*, 2009:1281). High social desirability can affect the validity of the results (Kolarcik, *et al.*, 2009). In this study, the questions in the questionnaire are based on self-report measures. A problem with self-report measures is their "*potential susceptibility to social desirability bias*" (Arnold and Feldman, 1981: 377). However, the test on social desirability is not included in this study because the analysis of common method bias and self-response bias has been applied and can consider enough to explain the demonstration of bias of the measures. Due to this, such elements designed in the questionnaire are significantly central because it can possibly control some element of social desirability.

In this study, three ways were executed in the questionnaire by some means to control for social desirability. Firstly, every questionnaire sent is attached with the cover front page of the questionnaire; and on each cover page, it is specifically stated that "in completing this questionnaire, please consider it in relation to the single biggest **current project** pursued by your organisation". This statement can remind the participants to only answer the questions in relation to their experience in organisations, and not based on respondent's self-favouring manner. Further, in this cover page, it is also indicated that "there are no 'right' or 'wrong' answers to any of these

questions” and respondents are encouraged to provide honest answers up to their best knowledge.

Secondly, there were no specific titles stated in each section in the questionnaire because title conceivably influences the perspective of respondents towards questions being asked. Respondent’s tendency to favour the subject matter (title) could harm the accurate answers. For example the measures of technology, market and competitive turbulence in the questionnaire were mixed together in one table (please refer to Question 2 in the questionnaire). Unstated title on that table should be able to avoid respondents’ bias to think on the subject matter to be discussed by the researcher in that section; it therefore controls self-report bias.

Thirdly, the respondents were contacted directly so that no other person would be aware of their responses or indeed having responded to the questionnaire; thus reducing the social undesirability problem.

4.4.9.4. Validity and Reliability Analysis

To investigate the accuracy of the created hypotheses, an examination of validity and reliability of all underlying item constructs is crucial. Most researchers use factor analysis to assess summarization or for data reduction because it can identify the separate dimensions of the structure and determine the extent to which each variable is explained by each dimension (Hair *et al.*, 1998; Churchill, 1999 and Pallant, 2007). This factor analysis is a class of multivariate statistical methods that define the underlying structure in a data matrix (Hair *et al.*, 1998, Churchill, 1999; Neuman, 2006). A principal component factor analysis was used to summarise the structure of a set of variables and to purify measures of items used in this study. An examination of validity can also be proved through correlation analysis, specifically, in

examining the correlation between theoretically defined sets of variables (Hair *et al.*, 1998). Such correlations were investigated in the factor analysis by examining the test of KMO and Bartlett test of sphericity. The eigenvalues of all factor loadings in the principal component factor analysis were also required to check whether the items were loaded according to the subdivision in the conceptual model constructed.

Once all factorability and validity of the data were confirmed, it was deemed crucial to examine reliability of constructed items. Reliability is an evaluation of the level of consistency between multiple measurements of a variable, which means that a measurement taken at any point in time is reliable (Hair *et al.*, 1998). As indicated by Hair *et al.* (1998) the internal consistency is a common method used to measure scale reliability. Cronbach Alpha is the assessment of scale reliability that is frequently used by most management and strategy literatures; for instance Jaworski and Kohli (1993), Akgun and Lynn (2002), Vera and Crossan (2005), Falshaw *et al.* (2006), Leybourne and Sadler-Smith (2006) and Akgun *et al.* (2007). The rationale for internal consistency is that the individual items or indicators of the scale should be measuring the same construct and therefore should be highly intercorrelated (Hair *et al.*, 1998). Thus, the use of Cronbach Alpha as a method to be adopted to assess scale reliability in this study is reasonable. A Cronbach alpha score must be above the recommended 0.70 threshold for acceptability, because it indicates a good reliability as suggested by Nunally (1978).

In testing the hypotheses of this study, the summated scales were then developed after the validity and reliability of data was confirmed. It is possible to assess the validation of summated scales by using other methods. Hair *et al.* (1998) suggest that convergent validity can be examined by looking

for alternative measures of a concept and then correlating them with the summated scale. Therefore, this study adopted the “item-total scale correlation” as the method used to examine the validity of the summated scales. The details of the test of data validation and reliability of item constructs can be seen in Chapter 6.

4.4.9.5. Correlation Analysis

Correlation analysis serves as an early stage of investigation of the accuracy of the model hypotheses. A correlation analysis is used to evaluate the strength and direction of the linear relationships between two variables (Pallant, 2007). The strength of the relationship can be checked through Pearson’s correlation coefficients on a range of -1 to +1; whereas the directions of relationship can be identified based on (1) a correlation of zero, which indicates no relationship between two variables, (2) a positive value, which indicates a positive relationship; and, (3) a negative value which represents a negative relationship. Once the direction of the relationship is established it is necessary to determine the significance of that relationship (Pallant, 2007). According to Pallant (2007), the significance of a relationship indicates the level of confidence that the researcher should have in the result obtained should, which not be greater than a 10% level of significance.

4.4.9.6. Regression Analysis

This study adopts standard multiple regression analysis to test hypotheses 1 through to 11, while hierarchical regression analysis is employed to test hypotheses 12 through to 15. This difference in approach is due to the different way of linking between the variables. In standard multiple regression analysis, all independent (or predictor) variables are entered into the equation at once in order to examine the relationship between

the whole set of independent variables and the dependent variable (Coakes and Steed, 2003; Pallant, 2007). *Hypotheses 1* through to *11* examine the direct association between independent and dependent variables. Whereas in using hierarchical regression, the researcher is attempting to determine the order of entry of the independent variables based on theoretical grounds and allows variance in outcome variables to be analysed at multiple hierarchical levels (Coakes and Steed, 2003; Pallant, 2007). *Hypotheses 12* through to *15* attempt to identify multiple levels of hierarchy by including a moderating factor that may impact on the link between the independent and dependent variables.

Multiple linear regression analysis is a common method in business and management research to analyse the relationship between a single dependent (criterion) variable and several independent (predictor) variables (Hair *et al.*, 1998; Meyers *et al.*, 2006). Multiple linear regression analysis is a dependence technique which requires the decisions of which variables will be selected to be the independent variables (predictor variables) and the dependent variables (variable being predicted). This regression analysis is based on correlation analysis but it permits an examination of a more complicated interrelationship among a set of variables in a more complex real-life research context (Pallant, 2007). Due to this, the multiple regression analysis can serve for greater explanation on how much of the variance in the dependent variable can be explained by the independent variables; and at the same time, the test can serve as an indication of the relative contribution of each independent variable (Pallant, 2007). This analysis allows the researcher to determine the statistical significance of the results regarding the model itself as well as the individual independent variables (Pallant, 2007). To summarise, this analysis has several significant uses such as (1) to determine how well a set of variables is able to predict the particular outcome selected

by the researcher, (2) to address which variable in a set of variables is the best predictor of an outcome; and, (3) to resolve whether a particular predictor variable is still able to predict an outcome when the effects of another variable are controllable or act as a moderator (Hair *et al.*, 1998; Meyers *et al.*, 2006; Brace *et al.*, 2006; Pallant, 2007).

4.5. Concluding Remarks

This chapter explained in detail the research design of this study which involves the intersection of philosophy (based on positivism stance), research strategies (employed a quantitative strategy), and specific research methods. This chapter evaluated and discussed how the data was generated; the sampling process and the choice of sample and population for this study; the data collection approach; the instrumentations; the type of measurement scale; the process of questionnaire design; the questionnaire validation process; and the actual data collection process. From the research methodology, it can be summarised that this study uses a cross sectional survey design to 1080 top managers of high technology-based companies in Malaysia. The analysis of data was then planned to be evaluated according to the hypotheses of the study. The following chapters (Chapter 5, 6 and 7) will present and interpret the analyses of the data.

Descriptive Statistics of the Sample

5.1. Introduction

The analyses of the study consist of empirical analysis and results 1 and 2. The empirical analysis and results 1 examine the descriptive statistics which are presented in Chapters 5 and 6. Chapter 5 presents the descriptive analysis of the sample respondents. This chapter starts with the descriptive analysis of the responding companies, which will be followed by the profile of those respondents. Further, tests of non-response bias, data screening and examination of each variable in this study are also explained in detail in order to guarantee the data can be used for further empirical analyses. Chapter 6 explains the purification of constructed data through the analysis of reliability and validity and the correlation between the thesis variables. Lastly, the empirical analysis and results 2 are presented in Chapter 7 by which set forth into the examination of research hypotheses according to the developed model.

5.2. Profile of the Responding Companies

This subtopic explains in detail the profile of the responding companies, comprising of respondents' response, type of industry, company size (according to number of employees and annual sales turnover); and, number of years the company has competed in the industry.

5.2.1. Respondents' Response

Table 5-1 represents the details of each directory according to the number of distributed questionnaires (N_Q), total of all returns (N_R), non usable responses (N_O), number of usable responses (N_U), adjusted number of distributed questionnaires (N_G); and the rates of usable responses.

TABLE 5-1: RATE OF RESPONSES FROM EACH SOURCE

Directory	N_Q	N_R	N_O	N_U	N_G	(N_U / N_G) (%)
Federation of Malaysia Manufacturers (FMM)	392	75	37	38	355	10.7
Biotechnology Company	103	36	26	10	77	13.0
MESDAQ Company	85	26	15	11	70	15.7
Multimedia Super Corridor (MSC) Status Company	500	154	85	69	415	16.6
<i>Total</i>	1080	291	163	128	917	

Based on this analysis, the rates of usable responses from each directory were between 10.7% to 16.6%. Specifically, 10.7% of responses were obtained from the Federation of Malaysia Manufacturers' directory, 13.0% from Biotechnology Company directory; 15.7% from Mesdaq Company directory and 16.6% from MSC Status Company directory. It is important to have the equality of variances among all the directories in order to avoid bias results. The maximum variance among the directories was only 6%, which can be considered a small amount of differentiation among variances, thus it is deemed that the overall sample was reasonably represented from each directory.

The survey questionnaire was distributed to 1080 high technology-based companies in Malaysia using the Dillman *et al.*, (2007) Tailored Design Method. A total of 291 questionnaire responses were collected, however, a 163

responses were non usable (a detailed segregation of each directory is presented in Table 5-1). Factors contributing to the non-usable responses included, change of address (133 responses), ceased operation (7), missing data (23). The author recognises that the identified high number of non-usable responses may largely be due to the out dated MSC Status directory used.

After discounting the non-usable responses, 128 useable responses were received. In using the adjusted number of distributed questionnaires, which totalled 917 respondents, the overall response rate was 14% (round-up). This is deemed an acceptable response rate for a top management survey questionnaire in social science research (Menon *et al.*, 1996; Baruch, 1999). Table 5-2 depicts the calculation of the percentage of usable responses.

TABLE 5-2: THE PERCENTAGE OF USABLE RESPONDENTS

Total number of distributed questionnaires, N_Q	1080
Total number of returned questionnaires, N_R	291
Number of non-usable responses, N_O	163
Number of usable responses, N_U	$(N_R - N_O) = 128$
Adjusted number of distributed questionnaires, N_G	$(N_Q - N_O) = 917$
Percentage of overall responses (including N_O)	$(N_R / N_Q) \times 100 = 26.9\%$
Percentage of usable responses	$[(N_R - N_O) / (N_Q - N_O)] \times 100 = 13.96\%$

5.2.2. Type of Industry

The study respondents derive from high technology-based companies in Malaysia. The classification of high technology-based companies can be categorised into four industries, namely, high technology (*e.g.* electrical and electronics manufacturing products, machinery products, chemical and adhesive products), biotechnology, information technology / information communication technology (IT/ICT), and telecommunications industry. The

classification of each industry is based on respondent's answer in Section C, Question 4 in the questionnaire (Please refer *Appendix 4*).

As illustrated in Table 5-3, the highest rate of responses were from the IT/ICT industry (51.6%), followed by the high technology industry (32.8%), biotechnology industry (8.6%) and telecommunications industry (7.0%).

TABLE 5-3: TYPE OF INDUSTRY

Type of Industry	Frequency	Percent
High Technology	42	32.8
Biotechnology	11	8.6
IT/ICT	66	51.6
Telecommunications	9	7.0
<i>Total</i>	128	100.0

The high percentage of responses from high technology and IT/ICT industry corresponds to the large number of such companies included in the survey sample, derived from the FMM and MSC directory (*e.g.* most of the companies identified from these directories are high technology and IT/ICT based companies). Different industries may appear bias results. Therefore, each item needs to be checked whether it has not violated the homogeneity of variance assumption. A one-way analysis of variance (ANOVA) was used to test whether there is a significant difference in the mean scores on the dependent variable across four industries. The details of the analysis of variance (ANOVA) and multiple comparisons among the industries are as attached in *Appendix 9*. The results show that the Levene's test for homogeneity of variances among the four different industries are not significant ($P > 0.05$) except five variables. In general, it can be concluded that the population variances for each group are approximately equal although they are coming from four different industries.

5.2.3. Company's Years of Operation

Table 5-4 presents three categories that depict the number of years of which the responding organisations have operated within their given industry. As can be observed from the analysis, 48.4% (62) of respondents are classified as 'mature' stage companies, that is, in operation for more than ten years. Followed by 'growth' stage companies with business operation between five to ten years, which account for 35.2% (45) of the total useable responses received. The final 16.4% (21) of responses were recorded from companies within the 'infancy' stage, that is, business operation of less than five years.

TABLE 5-4: YEARS OF COMPANY OPERATING IN THE BUSINESS

Year	Frequency	Percent
<5	21	16.4
5-10	45	35.2
>10	62	48.4
<i>Total</i>	128	100.0

5.2.4. Company Size

Previous studies revealed that the number of employees, sales turnover, company profits and market value reflect to the size and type of the company (Kumar *et al.*, 2001; Kichen, 2003). According to the National SME Development Council (2005), the size and type of company can be classified according to their number of employees and annual sales turnover. For instance, ICT based companies, with less than five employees and an annual sales turnover of less than RM200,000 are considered as 'micro size' enterprises; between five to nineteen employees or an annual sales turnover between RM200,000 to RM1 million are identified as 'small enterprise'; between twenty to fifty employees or between annual sales turnover of RM 1 million to RM 5 million are considered 'medium size' enterprises; finally, if

the number of employees exceeds fifty with annual sales turnover of RM5 millions, or above, companies are classified as 'medium to large enterprises' (National SME Development Council, 2005).

TABLE 5-5: NUMBER OF EMPLOYEES

Number of Employees	Frequency	Percent
<25	49	38.3
25-49	14	10.9
50-250	31	24.2
>250	34	26.6
<i>Total</i>	128	100.0

Table 5-5 illustrates the number of employees within each of the companies that responded. In accordance with the above, a company operating with less than 25 employees was considered a 'small enterprise' which reported the mean value of 11.04 (SD=5.91); whereas companies which had in the range of 25 to 49 employees were classified as 'small medium enterprise' with the mean score of 33.93 and standard deviation of 6.39. 24.3% of responding companies are considered a 'medium type enterprise', with 50 to 250 employees and the mean score of 110.51 (SD=58.36); and lastly, 26.6% of responding companies had more than 250 employees, these were depicted as 'medium to large enterprise' with the mean of 1818.24 (SD=1742.29). The high standard deviation for medium to large enterprise was due to the significant range of the number of employees with some respondent companies employing a workforce up to 8600.

Another yardstick that could be used to examine the size of the company is by identifying the company's total annual sales turnover. An open ended question was asked to determine the company's annual sales turnover. Table 5-6, presents these findings for 82 respondents; however, 46 of the total respondents refused to disclose the information because of company

confidentiality. Although previous research suggests that the measurement of corporate size can be gauged by the number of employees or the total annual sales turnover, there are a number of problems with this method. For instance, the IT/ICT based sector which develops software with only a few dozen employees operating the business could generate comparatively similar annual sales turnover to companies that manufacture the IT hardware with hundreds of employees operating in their corporation. As can be seen in Table 5-6, 34 companies can be categorised as large on the basis of the number of employees, while 44 companies classify as large on the basis of their total annual sales turnover. The differences between the two categories show that there is some discrepancy between measures with no absolute yardstick to demonstrate definite measurement as to the size of a company.

TABLE 5-6: COMPANY'S ANNUAL SALES TURNOVER

Annual Sales Turnover	Frequency	Percent
Less than RM200,000	10	7.8
Between RM200,001 and RM1,000,000	10	7.8
Between RM1,000,001 and RM 5,000,000	18	14.1
More than RM5,000,000	44	34.4
Total before minus NA	82	64.1
<i>Non Applicable (NA)</i>	46	35.9
<i>Total</i>	128	100.0

Hence, it is essential to identify whether there is equality of variances among the respondents that are coming from various company sizes. A one-way analysis of variance (ANOVA) is an appropriate test to be used in comparing the means of more than two groups. In this analysis, a homogeneity of variances with a significant level of $p < 0.05$ was identified. A further test to examine the significant differences of mean values among groups was also identified by using the F-ratio and the F-probability value; as well as a Tukey HSD test. The results show that the Levene's test for homogeneity of variances according to the number of employees as well as

annual sales turnover are not significant ($P>0.05$) except seven variables for each case (please refer *Appendix 10* for details of the analysis of variance (ANOVA) and multiple comparisons among the groups). In general, it can be concluded that the population variances for each group are approximately equal although they are coming from different corporate sizes.

5.2.5. Number of Years Company Competing in the Industry

This descriptive analysis determines the number of years an organisation has been actively operating and contending in high technology-based industry. This analysis is significantly important as some companies are diversified companies and participated in various industries, which not principally based on high technology products. Therefore, the number of years a company have been operating in the business might be different to the company's years of experience competing in high technology-based industry.

TABLE 5-7: YEARS OF COMPANY COMPETING IN HIGH TECHNOLOGY-BASED INDUSTRY

Year	Frequency	Percent
<5	22	17.2
5-10	52	40.6
>10	54	42.2
<i>Total</i>	128	100.0

This study reveals three categories for companies competing in an industry (see Table 5-7). Only 17.2% of the 128 companies examined have been competing in the industry for less than five years. Categorically, these companies are fairly new in the industry with the mean value of 3.32 ($SD=0.89$). On the other hand, 42.2% or 54 companies have been competing in the industry for more than ten years. The mean value of 24.26 and standard deviation of 15.82 has shown that these companies can be classified as well experienced organisations with proven ability to sustain and compete in their

industry. In the meantime, almost 41% of the respondents with the mean value of 7.74 (SD=1.76) stated that their respective companies have been competing in the industry between five to ten years.

5.3. Profile of the Respondents

This section is focusing on respondents' demographic profiles such as respondents' educational background, age, gender, experience and position within their respective companies.

5.3.1. Respondents' Position

Respondents' position includes Chief Executive Officer (CEO), managing directors, Chief Operating Officer (COO), general managers, senior managers and project managers. Almost half of the respondents (48.4%) were CEOs and managing directors. Most of them were owner or founder of the company. The remaining 51.5% were coming from top management teams such as COO (8.6%), general managers (6.3%), senior managers (31.2%) and project managers (5.5%). Further details are illustrated in Table 5-8.

TABLE 5-8: RESPONDENTS ' CURRENT POSITION

Current Position	Frequency	Percent (%)
CEO / Managing Director	62	48.4
COO	11	8.6
General Manager	8	6.3
Senior manager	40	31.2
Project manager	7	5.5
<i>Total</i>	128	100.0

The respondent's experience in their current position is also important to be identified because it could represent the extent of knowledge and skills they possess in their current position. Table 5-9 illustrates the number of years respondents have held their current job position in their present company. More than half (53.1%) of the respondents are relatively new in their current

job position with less than five years' experience, demonstrated by the mean score of 2.31 (SD=1.13). On the other hand, 46.9% of the respondents are relatively proficient in their post, occupying their position for more than five years.

TABLE 5-9: YEARS OF RESPONDENTS' CURRENT POSITION IN THE COMPANY

Year	Frequency	Percent
Less than 5	68	53.1
Between 5 to 10	40	31.3
More than 10	20	15.6
<i>Total</i>	128	100.0

5.3.2. Involvement of the Respondents

In this study, all respondents ranked within the top management hierarchy of the company. The researcher distributed the questionnaire to respondents involved in strategic planning and the decision making process, such as the founders or owners of the company, executive directors, managing directors, chief executive officers and chief operating officers. However, it is important to determine whether the informants targeted are indeed the right individuals to provide the necessary primary data as required by this study. This is deemed vital in eliminating non-response bias among respondents.

Two questions were asked in the questionnaire to determine the extent of respondents' knowledge regarding the questions asked (Knowledge 1); and the extent to which responses given accurately reflect the reality of their organisation involvement in their current business situation (Knowledge 2). A Likert scale ranging from (1) 'no knowledge' to (7) 'full knowledge' was used to gauge question responses. Table 5-10 demonstrates respondents' knowledge from moderate to fully knowledgeable. The results from both

questions showed that all respondents were considered to be sufficiently knowledgeable to provide a response to questionnaire items, with 16.4% and 17.2% of respondents, over the two questions, regarding themselves as fully knowledgeable.

TABLE 5-10: RESPONDENTS' KNOWLEDGE LEVEL

Knowledge Level	<i>Knowledge 1</i>		<i>Knowledge 2</i>	
	Frequency	Percent	Frequency	Percent
Moderate	11	8.6	18	14.1
more knowledge	53	41.4	42	32.8
partly full of knowledge	43	33.6	46	35.9
full knowledge	21	16.4	22	17.2
<i>Total</i>	128	100.0	128	100.0

To identify potential non-bias responses among respondents, an Independent Sample T-test analysis was conducted to check whether there was significance different on 'knowledge ability' level between CEO/managing directors and other level of managers. In some small organisations with less than 25 employees for example, senior managers and project managers can be part of top management teams and they are considered crucial in a firm's strategic decision making. However, to prove this assumption, identification of potential non-bias responses among respondents was conducted. An Independent Sample T-Test was used to check whether there was significance different on 'knowledge ability' level between CEO/managing directors and other level of managers.

The sample was split into two groups, namely (1) CEO group and (2) Top Managers (TM) group. Table 5-11 illustrates the analysis between the CEO/MD group and the Top Managers group. In question one, the results show a mean value of 5.758 ($SD=0.803$) for the CEO/MD group and 5.409 ($SD=0.894$) for the top managers group. In question two, the results reveal that the mean of the CEO/MD group was 5.758 ($SD=0.935$) and the top managers

group was 5.378 ($SD=0.907$). Both questions show insignificant differences between the variances of the groups. Even though respondents were a mixture of general managers, (senior managers and project managers), the result can be assumed valid that these respondents were knowledgeable enough to answer all the questions and at the same time reflects their actual involvement in the current business situation.

TABLE 5-11: THE DIFFERENCE BETWEEN GROUPS AND LEVEL OF RESPONDENTS' KNOWLEDGE

Questions about respondent's knowledge	Position	N	Mean	SD	Levene's Test for the Equality of Variances	
					F	Sig
<i>Knowledge 1:</i>	CEO/MD	62	5.758	0.803	0.828	0.365
	Top Managers	66	5.409	0.894		
<i>Knowledge 2:</i>	CEO/MD	62	5.758	0.935	0.004	0.949
	Top Managers	66	5.378	0.907		

5.3.3. Respondents' Age

In this study, respondents' age was classified into four categories as depicted in Table 5-12. Almost 40% of the respondents are in the middle aged bracket with the mean value of 35 years ($SD=2.80$). The second highest category is from the age bracket of 41 to 50 years with the mean value of 46.18 and a standard deviation of 0.50.

TABLE 5-12: RESPONDENT'S AGE

Age	Frequency	Percent
20-30	19	14.8
31-40	51	39.8
41-50	38	29.7
>51	20	15.6
<i>Total</i>	128	100.0

With reference to those respondents aged 50 or above and aged between 20 to 30 years old, these age bracket represent a relatively low percentage of respondents, specifically, 15.6% and 14.8% respectively. Hence, the results illustrate that the average age of top management is between 30 to 50 years.

5.3.4. Respondents' Position and Age

Table 5-13 cross tabulates respondents' age with their current position in the company. As can be seen in the table, the respondents' position correlates to their age. Here, we can see that 'senior' respondents (more than 40 years old) hold top management positions, such as CEO and managing directors, while 'junior' respondents (below 30 years old) occupy corporate managerial roles. However, quite surprisingly, six CEO/MDs are aged 30 and below. After browsing the details of their comments from their returned questionnaire, it is evident that all of them are owners of their respective companies, thus holding top management positions.

TABLE 5-13: RESPONDENTS' POSITION AND AGE

Respondents' Position	Age Range				Total
	20-30	31-40	41-50	>51	
CEO or MD	6	18	22	16	62
COO	0	5	4	2	11
General Manager	0	4	4	0	8
Senior Manager	11	20	7	2	40
Project Manager	2	4	1	0	7
<i>Total</i>	19	51	38	20	128

5.3.5. Respondents' Level of Education

The level of education of respondents is categorised into four brackets. As depicted in Table 5-14, the results show only 3.9% of respondents possessed a higher certificate (Malaysian Higher School Certificate *e.g.* STPM or SPM) and the rest had been involved in higher education (Diploma or above). Therefore, the results suggest that the high technology-based

companies in Malaysia are progressively led by graduates who have a higher education background.

TABLE 5-14: LEVEL OF EDUCATION OF RESPONDENTS

Level of Education	Frequency	Percent
Masters or higher	43	33.6
Degree	70	54.7
Diploma	10	7.8
STPM/SPM	5	3.9
<i>Total</i>	128	100.0

Table 5-15 illustrates the cross-tabulation results between job position and level of education. In general, it can be concluded that most top management positions of the company are held by people who had a higher level of education. However, it is quite surprising when five CEOs/ MDs possessed only a higher school certificate. It is completely explained that they are very competent person and are having ample experience on their work to finally achieving the high position in the company.

TABLE 5-15: RESPONDENTS' JOB POSITION AND LEVEL OF EDUCATION

Respondents' Position	Level of Education				Total
	masters or higher	degree	diploma	STPM/ SPM	
CEO or MD	28	25	4	5	62
COO	3	6	2	0	11
General Manager	1	6	1	0	8
Senior Manager	9	28	3	0	40
Project Manager	2	5	0	0	7
<i>Total</i>	43	70	10	5	128

5.3.6. Respondents' Gender

Table 5-16 shows the respondents' gender. From 128 respondents, 72.7% (93) of them are male respondents and the remaining 27.3% (35) are female

respondents. From this observation, the significantly higher number of male respondents is considered as a normal phenomenon because most of the respondents' companies are predominantly male-owned organisations.

TABLE 5-16: GENDER OF RESPONDENTS

Sex	Frequency	Percent
Male	93	72.7
Female	35	27.3
<i>Total</i>	128	100.0

5.3.7. Years of Respondents Working in the Current Company

Table 5-17 shows the number of years of which the respondents have been employed by their current respective companies. About 39.8% of the respondents have been employed for less than five years in their current company, 32.8% between five to ten years, and the remaining 27.3% of the respondents have already worked for more than ten years in their current company.

TABLE 5-17: YEARS OF RESPONDENTS WORKING IN THE CURRENT COMPANY

Year	Frequency	Percent
<5	51	39.8
5-10	42	32.8
>10	35	27.3
<i>Total</i>	128	100.0

5.3.8. Years of Respondents' Experience in the Particular Industry

Respondents' experience in a particular industry could be very important in organisational decision making processes and in particular, organisational improvisation and firm performance (Crossan and Sorrenti, 1997). The analysis of respondents' industrial experience revealed that 63 (49.2%) respondents have had experience of more than ten years with the

mean value of 19.44 (SD=7.16); 48 (37.5%) respondents had between five to ten years with the mean value of 7.89 and the standard deviation of 1.79; and only 17 (13.3%) of them had less than five years of experience in their industry with the mean value of 2.25 and standard deviation of 1.23. Table 5-18 further illustrates this information.

TABLE 5-18: YEARS OF RESPONDENT'S EXPERIENCE IN TECHNOLOGY-BASED INDUSTRY

Years	Frequency	Percent
<5	17	13.3
5-10	48	37.5
>10	63	49.2
<i>Total</i>	128	100.0

5.3.9. Years of Respondents' Position and Experience in the Particular Industry

The relationships between respondents' position and year of experience in their involvement industry are demonstrated in Table 5-19. Unsurprisingly, the number of CEOs or MDs with experience of more than ten years was the highest among respondents. Likewise, most of the COOs had substantial working experience in their respective industry. While according to general managers, more than half of them had experience of more than 10 years. For senior managers and project managers, most of them had experience between five to ten years. In conclusion, the results demonstrate that the more experience the respondents have, the higher the position they hold in the company.

**TABLE 5-19: YEARS OF RESPONDENTS' POSITION AND EXPERIENCE
IN TECHNOLOGY-BASED INDUSTRY**

Respondents' Position	Years of experience in the industry			Total
	<5	5-10	>10	
CEO or MD	8	14	40	62
COO	1	4	6	11
General Manager	0	3	5	8
Senior Manager	7	22	11	40
Project Manager	1	5	1	7
<i>Total</i>	17	48	63	128

5.4. Test for Non-Response Bias

Prior to further analysis, it is important to examine for non response bias among the responding companies. The sample should never be generalised without estimating the potential for bias (Armstrong and Overton, 1977). Moreover, organisational sample surveys with low response rates can produce biased samples, particularly if key organisational characteristics affect the pattern of survey response (Tomaskovic-Devey *et al.*, 1994). There are three methods for estimating non-response bias, namely comparison with known values for the population, subjective estimates, and extrapolation methods (Armstrong and Overton, 1977). In interpreting the non-response bias, an extrapolation method proposed by Armstrong and Overton (1977) was used in this study to determine the difference between early respondents and late respondents. Extrapolation methods are based on the assumption that subjects who respond less readily are similar to non-respondents (Armstrong and Overton, 1977). Hence, it is assumed that the respondents who answered in the third wave of the questionnaire are likely to be similar to non-respondents.

In this study, the first 40 responses received from the first wave group of respondents are classified as '*early group*' and the last 40 responses in the

third wave group of respondents are classified as 'late group'. Independent Samples t-Test was used to determine any significant difference between means for the two set of scores. *Levene's test* was used to test homogeneity of variance. In this case, if the significance level is greater than .05 ($p > 0.05$), it can be assumed that the population variances for each group are approximately equal. Detailed results can be seen from Table 5-20 to Table 5-25.

Table 5-20 shows the analysis of non-response bias on organisational improvisation. The results demonstrate that there is no significant difference between early and late respondents, except for item 7 ($F=5.089$, $p < 0.05$).

TABLE 5-20: A TEST FOR NON-RESPONSE BIAS ON ORGANISATIONAL IMPROVISATION

Measures Improvisation	Mean		Levene's Test for Equality of Variances	
	Early Group	Late Group	F statistics	Significant Level
deal with unanticipated events	5.5250	4.8250	.036	.849
think on my feet	4.9500	5.0750	.203	.653
respond in the moment	5.4500	5.3500	.695	.407
try new approaches to problems	5.8500	5.5250	1.819	.181
take risks when producing new ideas	5.5000	5.4500	.035	.852
demonstrate originality	5.6250	5.4000	1.073	.303
identify opportunities	6.1500	5.7000	5.089	.027*

In relation to the measures of reasoning factors, Levene's test reveal non-significant differences between both groups (*see* Table 5-21). From these results, it can be concluded that there is high similarity of opinion between groups on reasoning factors.

TABLE 5-21: TEST FOR NON-RESPONSE BIAS ON REASONING FACTORS

Measures Cognitive Factor	Mean		Levene's Test for Equality of Variances	
	Early Group	Late Group	F statistics	Significant Level
challenge thinking abilities	5.4250	4.9000	.000	.995
requires a lot of thinking	5.9250	5.3250	3.616	.061
prefer complex problems	4.0000	4.4250	2.031	.158
little satisfaction	4.7750	4.3250	.014	.905
thinking is not my idea of fun	5.3500	5.3250	.044	.835
the notion of thinking	5.2000	5.1500	.852	.359

understanding the reasons for the answer to a problem	5.3750	5.7750	1.677	.199
don't reason well under pressure	5.3750	5.1000	1.108	.296
the idea of relying on thought	4.9000	5.1250	.045	.833
learning new ways to think	5.4750	5.6750	.833	.364
prefer a task that is intellectual, difficult, and important	4.3500	4.3000	.179	.673
prefer to accept things as they are	5.5000	5.1250	.006	.936
enough for me that something gets the job done	4.9750	5.0000	1.172	.282
difficulty thinking in new and unfamiliar situations	5.4500	4.9000	2.393	.126
initial impressions of situations are almost always right	4.0750	4.3000	.017	.896
trust my initial feelings	4.3500	4.7500	.417	.520
believe in trusting my hunches	4.3250	4.5750	.236	.628
very intuitive person	4.6000	4.8500	1.208	.275
have clear visual images of things	5.2000	5.1250	.280	.598
good at visualizing things	5.3000	5.3000	.148	.701

Table 5-22 represents the findings for non-response bias on individual managerial factors. As can be seen in the table, only 3 items (make intuitive judgments; aware of critical managerial issues; knowledgeable about work) demonstrate significant differences between early responses and late responses ($p < 0.05$).

TABLE 5-22: TEST FOR NON-RESPONSE BIAS ON INDIVIDUAL MANAGERIAL FACTORS

Measures Individual Managerial Factor	Mean		Levene's Test for Equality of Variances	
	Early Group	Late Group	F statistics	Significant Level
<i>Manager's self confidence</i>				
make and execute a strategic plan simultaneously	5.2750	5.5000	.363	.548
engage in spontaneous actions	5.1250	5.3000	.495	.484
make intuitive judgments	5.4250	5.4500	4.772	.032*
improvise when the company facing uncertainty	5.4500	5.4250	.172	.679
<i>Manager's expertise</i>				
aware of critical managerial issues	5.9000	5.3500	5.209	.025*
knowledgeable about work	6.0250	5.6500	4.988	.028*
knowledge in diverse fields	5.7000	5.1500	.043	.837
<i>Manager's attitude towards risk</i>				
enjoy taking risks	5.4500	4.9250	.304	.583
not bother to take risks	5.1000	5.1500	1.196	.278
people told - enjoy taking risks	4.7750	4.7250	.039	.844

In Table 5-23, there are 35 measures used to determine organisational factors. Only 4 item measures (high debt financing; high risk high return investments; information systems to support work; adapt personal approach

to the situation at hand) show a significant difference between both groups and the remaining 30 item measures reveal equality of variances at a significant level of more than 0.05.

TABLE 5-23: TEST FOR NON-RESPONSE BIAS ON ORGANISATIONAL FACTORS

Measures	Mean		Levene's Test for Equality of Variances	
	Early Group	Late Group	F statistics	Significant Level
<i>Organisational Risk Taking</i>				
heavy reliance on innovation	5.1500	5.3000	1.431	.235
high debt financing	3.2250	3.4500	5.393	.023*
heavy R&D	4.7750	4.9250	1.549	.217
high risk, high return investments	4.2000	4.7500	5.059	.027*
<i>Real time information and communication</i>				
up-to-date information through meetings	5.1750	5.3250	.726	.397
Readily shared information within organisation	5.1250	4.7500	.171	.681
Receive information about other departments' activities	4.9750	4.6000	.536	.466
information on external environment	5.2000	4.7500	.310	.579
<i>Procedural memory</i>				
well-defined procedures	5.3750	5.1250	.072	.789
keep records of past projects	5.6250	5.6500	.148	.702
information systems to support work	5.8250	5.4250	4.557	.036*
up-to-date files and databases	5.7000	5.3750	.990	.323
<i>Minimal Structure</i>				
little action taken until a superior makes a decision	3.8250	4.1750	1.176	.282
own decisions would be discouraged	2.4000	3.1000	.288	.593
small matters have to be referred to someone with more authority	2.7750	3.0750	1.382	.243
any decision has to have boss's approval	3.6750	3.7750	1.901	.172
People follow written work rules	4.2500	3.7250	.842	.362
things are done is never left up	3.7000	3.9250	1.647	.203
<i>Clarity of goal</i>				
clear vision of the target market	5.6500	5.6000	1.572	.214
clear understanding of target customers' needs and wants	5.7000	5.5500	1.014	.317
Overall business goals are clear	5.8750	5.6000	3.465	.066
<i>Organisational Flexibility</i>				
explore a wide variety of approaches to a problem	5.4500	5.5000	1.298	.258
plan ahead	5.6000	5.2500	.030	.863
create multiple courses of action	5.2500	5.1750	.019	.890
adjust well to new equipment, process, or procedures	5.4250	5.2750	1.872	.175
adapt personal approach to the situation at hand	5.5250	5.4250	7.196	.009*
cope with stressful events effectively	5.7000	5.4000	.565	.454
maintain productivity in challenging circumstances	5.8250	5.4250	.549	.461
adapt to change with minimal stress	5.6750	5.0500	.596	.443
consider to be a flexible person	5.8000	5.4750	1.657	.202
adapt company strategy adequately to changes in the business environment	5.6750	5.3000	.778	.380
adapt company strategy adequately to	5.4500	5.2750	1.374	.245

changes in competitors' product-market strategies				
adapt company strategy quickly to the changing needs of customers	5.7750	5.3250	.295	.588
react quickly to new product-market threats	2.8000	2.9750	.279	.599

The analysis for non-response bias on environmental turbulence is presented in Table 5-24. 10 items illustrate equality of variances between early and late respondents ($p > 0.05$), and 3 items (technology used changing rapidly; technological breakthroughs in the industry; competitors can readily match) show insignificance different between those groups; where $p < 0.05$.

TABLE 5-24: TEST FOR NON-RESPONSE BIAS ON ENVIRONMENTAL TURBULENCE

Measures	Mean		Levene's Test for Equality of Variances	
	Early Group	Late Group	F statistics	Significant Level
technology used changing rapidly	5.6250	6.2750	9.107	.003*
relevant technology changing rapidly	5.7000	5.9750	1.535	.219
technological breakthroughs in the industry	5.7250	5.9250	5.207	.025*
Technological changes provided big opportunities	6.0750	5.8500	.071	.791
changes of customers' preferences	5.4250	5.4000	.471	.494
customers tend to look for new products all the time	5.3500	4.9250	.137	.713
witness demand from new customers	5.2250	5.2500	.747	.390
competition is cut-throat	5.4000	4.9500	3.541	.064
many 'promotion wars'	5.3000	4.8750	.041	.840
competitors can readily match	4.8250	5.1000	6.878	.010*
price competition is a hallmark	5.0000	4.6500	.776	.381
new competitive move almost every day	4.3250	4.5250	.520	.473
our competitors are weak	4.8000	4.2750	1.071	.304

Lastly, Table 5-25 represents the results for non-response bias on firm performance. All measures report no significance different between early and late respondents except item 4 ($p < 0.05$).

TABLE 5-25: TEST FOR NON-RESPONSE BIAS ON FIRM PERFORMANCE

Measures	Mean		Levene's Test for Equality of Variances	
	Early Group	Late Group	F statistics	Significant Level
Long term profitability	5.1750	5.2750	.421	.518
Sales growth	5.0750	5.3250	1.761	.188
Financial resources (liquidity and	4.9500	4.9000	.774	.382

investment capacity)				
Public image	5.2750	5.2500	5.996	.017*
Client loyalty	5.3250	5.4750	1.305	.257

In general, the pattern of survey response shows that most measures interpret equal variance estimate (as assessed by Levene's Test for equality of variances) between early and late group of respondents. Then, a test for equality of means was used in order to testing differences between two means. The detail for the t-tests for equality of means is as depicted in *Appendix 11*. The results of the t-test for equality of means show most variables illustrate the probabilities of more than 0.05. Therefore it was suggesting that non-response bias was not a problem and all respondents can be used as a sample in this study.

5.5. Examination of Common Method Bias

A common method bias is tested using exploratory factor analysis. In this factor analysis, all measures / variables were tested at once; and if the analysis of all variables load more than one factor with an Eigenvalue greater than 1.0 and the first factor does not account for the majority of the inter-item covariance, these indicate that a common method bias does not seem to be an issue in this research (Podsakoff and Organ, 1986).

After analysing all constructs of this survey (please refer to *Appendix 10*), a common method bias does not seem to be a major issue in this research due to the results represent more than one factor with an Eigen value greater than 1.0.

5.6. Examination of Data

Data examination is an important step in exploring the characteristics of the data. A good data set can lead to better prediction and more accurate assessment of dimensionality (Hair *et al.*, 1998). There are several factors that

may influence the characteristics of the data set, such as missing values, errors in data entry, and non-normality of data distribution (Hair *et al.*, 1998).

5.6.1. Examining the Missing Value

Missing data could affect the generalisability of the results. Missing data could be due to errors in data entry or data collection problems; or action on the part of the respondents such as refusal to answer certain questions that leads to missing values (Hair *et al.*, 1998).

This study adopts an imputation method to address missing data. Imputation is the process of estimating the missing value based on valid values of other variables in the sample (Hair *et al.*, 1998). Due to a very small number of missing data disclosed from the variables, it is suggested that the imputation of estimated missing value does not have a substantial impact on the analysis.

5.6.2. Examining Normality

The assumption of normality is a prerequisite for many inferential statistical techniques (Coakes and Steakes, 2003). The assumption can be explored through a graphical analyses or statistical tests of normality (Hair *et al.*, 1998). A simple diagnostic test (graphical test) of normality can be carried out using a histogram, stem-and-leaf plot, box plot, normal probability plot or detrended normal plot (Coakes and Steakes, 2003). The skewness and kurtosis value, Kolmogorov-Shirnov statistic with a Lilliefors significance level and the Shapiro Wilks statistics are among other statistical test of normality.

In this study, normality was examined using a normal probability plot. From the analysis, all variables were normally distributed. A statistical test of normality was then used to strengthen this assessment. The skewness and kurtosis value were used to observe the data distribution. In this analysis, it is

important to examine a zero value for skewness and kurtosis because it indicates an exact normal distribution of data (Coakes and Steed, 2003). In addition, according to Hair *et al.* (1998), a calculated value of ± 2.58 at the probability level of 0.01 or ± 1.96 at the probability level of 0.05 indicates the assumption of non-normality distribution. By using the descriptive statistics in SPSS, the observations of all kurtosis and skewness of every variables show that the values of skewness ranged from -1.375 to 0.705 at the 0.05 probability level; and the kurtosis statistics ranged from -1.407 to 2.169 at the 0.01 probability level. The results clearly conclude that all variables are normally distributed and thus it can be used for further empirical analyses.

5.7. Concluding Remarks

This chapter discussed the preliminary stages of the empirical analyses, presenting a descriptive analysis of the survey respondents. This is deemed an important initial process of understanding the characteristics of the studied sample. Nonetheless, analyzing the descriptive findings raises fundamental questions that cannot be answered merely through descriptive analysis and hence, further empirical analyses are needed. This chapter also reveals the tests of non-response bias and an examination of the data. A clear observation on non-response bias and data examination was presented to further improve the researcher's effort to purify and analyze the data for the later stages of empirical analyses.

Chapter 6

Validity and Reliability Analysis

6.1. Introduction

Chapter 6 explains the purification of measures subject to criteria of scale validity and reliability. Factor analysis is used to determine the validity of the data and Cronbach alpha coefficient is used to test for the reliability of measures. SPSS version 16.0 is used to test for both analyses. After the data is confirmed valid and reliable, the summated variables are constructed before testing the research hypotheses.

6.2. Investigating Validity through Factor Analysis

Validity is the extent to which a scale or a set of measures accurately represents the concept of interest (Hair *et al.*, 1998). There are several types of validity such as content validity (as discussed in Chapter 4), convergent, discriminant and nomological validity. Previous social research has widely used convergent and discriminant validity in assessing the validity of item construction. Convergent validity assesses the degree to which scores on a test correlate with scores on other tests that are designed to assess the same construct; whilst discriminant validity is the degree to which two conceptually similar concepts are distinct (Hair *et al.*, 1998). However, according to Pallant (2007), there is no one clear-cut indicator of scale validity. An empirical test of construct validity can be assessed through factor analysis (Gandek and Ware, 1999; Hill and Hughes, 2007).

Factor analysis is a class of multivariate statistical methods that define the underlying structure in a data matrix (Hair *et al.*, 1998, Churchill, 1999; Neuman, 2000). It is used to analyze interrelationships among variables and to explain these variables in terms of their common underlying factors (Hair *et al.*, 1998). Most researchers use factor analysis to assess summarization or for data reduction because it can identify the separate dimensions of the structure and determine the extent to which each variable is explained by each dimension (Hair *et al.*, 1998). Further, it is an appropriate analysis if the researcher wants to determine whether items are tapping into the same construct and thus it can be used for construction of summated scales (Hair *et al.*, 1998; Churchill, 1999 and Pallant, 2007). Therefore, factor analysis is utilised in this study, since the objective is to reduce the data set and establish underlying factors of the constructs under examination. Further, the derived factors from the factor analysis can be turned into summated scales and used for hypotheses testing through analysis techniques such as correlation and multiple regression analysis (Hair *et al.*, 1998 and Pallant, 2007).

There are two techniques of factor analysis which are widely used in social science research – exploratory or confirmatory. Exploratory factor analysis is distinct from the confirmatory perspective because it principally searches for the structure among a set of variables or as a data reduction method whereas the confirmatory factor analysis mostly involves the test of hypothesis such as which variables should be grouped together on a factor or the precise number of factors. In this study, exploratory factor analysis was used in order to explore the structure contained within a set of observed variables as well as to evaluate the proposed dimensionality for the new construct variables.

The researcher recognises that a number of requirements need to be fulfilled before undertaking factor analysis. The first criterion is to determine an acceptable sample size of at least a minimum of five subjects per variable (Coakes and Steed, 2003) or ten times as many observations as there are variables to be analysed (Hair *et al.*, 1998). In this study, the analysis of factor is tested into three separate analyses. The separation of analyses is deemed necessary to retain the stability of the factor loadings of the various study constructs and simultaneously ensure that the ratio of variables to sample size is maintained at 1:5 (Coakes and Steed, 2003).

Secondly, it is significant to consider the linearity and normality of the variables (Coakes and Steed, 2003). The detailed analyses of linearity and normality of the study variables have been thoroughly explained in Chapter 5 and the results revealed that all variables are linear and normally distributed. Therefore, all variables can be used for further analysis of the factor.

The third requirement that needs to be considered is to identify the appropriateness of factor analysis and this was found by examining the correlations matrix (Hair *et al.*, 1998). The factor analysis is probably appropriate if the number of correlations are greater than 0.3 (Hair *et al.*, 1998). The Bartlett test of sphericity and the Kaiser Meyer Olkin (KMO) measure of sampling adequacy (MSA) are used to investigate the validity of the constructs. Moreover, they are used to quantify the degree of intercorrelations among variables and the appropriateness of factor analysis, which illustrates the index ranges from 0 to 1 (Hair *et al.*, 1998). The measure can be interpreted to five conditions, 0.80 or greater is to be considered as 'meritorious'; 0.70 or above is to be considered as 'middling', 0.60 or above is 'mediocre'; 0.50 or above is to be considered as 'miserable'; and 0.50 and below is to be considered as 'unacceptable' and should be excluded from the analysis (Hair

et al., 1998). Regarding this study, the factorability is assumed if the Kaiser Meyer Olkin (KMO) is greater than 0.6. The results of Kaiser Meyer Olkin (KMO) and Bartlett's Test of Sphericity are shown in Table 6-1.

TABLE 6-1: INVESTIGATING VALIDITY: RESULT OF KMO MEASURE OF SAMPLING ADEQUACY AND BARTLETT'S TEST OF SPHERICITY

Construct	KMO Measure of Sampling Adequacy	Bartlett's Test of Sphericity
Organizational Improvisation (+) Individual Managerial Factors	.823	2094.110**
Organisational Factors	.849	2589.706**
Environmental turbulence (+) Firm Performance	.792	1099.57**

** $p \leq 0.01$

As can be seen in Table 6-1, the scores for KMO measures of sampling adequacy for all constructs are above 0.7, where the measures are seen as most acceptable and valid to use for further analysis. Two out of three constructs have KMO scores that could be deemed as 'meritorious' at the 0.8 level of adequacy. This constructs with 'meritorious' level of adequacy are organisational improvisation and managerial factors; as well as organizational factors. Whilst environmental turbulence and firm performance construct has KMO scores that could be considered as 'middling' at the 0.7 level of adequacy. However, this construct have demonstrated KMO scores that are incredibly close to the meritorious level of adequacy of 0.792. As a conclusion, the result of the overall KMO measure of sampling adequacy revealed that all scores are above the 0.5 acceptable thresholds and therefore are deemed appropriate and valid for further analyses.

In order to prove further existence of validity, the Bartlett's test of sphericity was used to examine the overall significance of all correlations among the variables within a correlation matrix. The statistical scores of this test for all constructs are shown in Table 6-1. The scores are in the range of above 100 to more than 1000 with all measures showing high significant relationships ($p \leq 0.01$) among the variables of each construct. Therefore, it is concluded that the correlation is sufficiently large to permit factor analysis and represent the validity of the constructs.

Once all the three requirements are fulfilled, factor analysis can be performed to identify the underlying structure of the relationships. Two basic models exist – common factor/ principal axis factoring or component factor analysis – a choice therefore needs to be made as to which one to employ before the extraction of the factors; which depends on the researcher's objectives (Hair *et al.*, 1998). Common factor analysis is used to identify underlying factors that reflect what variables share in common whereas the component analysis is used when the objective is to summarise most of the original information in a minimum number of factors for prediction purposes (Hair *et al.*, 1998). The variance attributable to both models distinguishes them from each other. There remains considerable debate over which factor model is more appropriate, since both analyses demonstrate identical results if the number of variables exceeds thirty or the communalities exceed 0.60 for most variables (Hair *et al.*, 1998). Two basic models exist – common factor / principal axis factoring or component factor analysis – a choice therefore needs to be made as to which one to employ before the extraction of the factors, which depends on the researcher's objectives (Hair *et al.*, 1998). Common factor analysis is used to identify underlying factors that reflect what variables share in common whereas the component analysis is used when the objective is to summarise most of the original information in a

minimum number of factors for prediction purposes (Hair *et al.*, 1998). The variance attributable to both models distinguishes them from one another. There remains considerable debate over which factor model is more appropriate, since both analyses demonstrate identical results if the number of variables exceeds thirty or the communalities exceed 0.60 for most variables (Hair *et al.*, 1998).

In this research, the purpose of analyses of factors is to reduce the dimensionality of a data set which can lead to the discovery of new meaningful underlying variables. Principal component analysis can be considered the favoured method for the pragmatic purposes of data reduction (Cureton and D'Agustino, 1983) which sets out to represent all of the variance in the X variables through a small / minimum set of components (Jolliffe, 2002). Therefore, the component analysis was confirmed to be used as a factor method in extracting the factors in this study.

In the extraction of the factors, the researcher has to decide the criteria for the number of factors to extract. Hair *et al.* (1998) suggest four criteria should be considered for the extraction process such, which includes latent root criteria, a priori criterion, percentage of variance criterion and scree test criterion. After screening all the criteria, the researcher chooses to use latent roots or eigenvalue techniques in extracting the factors for this study. The rationale for this eigenvalue criterion is that any individual factor should account for the variance of at least a single variable if it is to be considered significant and be retained for interpretation (Hair *et al.*, 1998; Churchill, 1999). The eigenvalue criterion was selected in assessing the retention of the factors; factors which fell below the eigenvalue threshold of 1 were not included in the final factor solution. The results of each extraction of factor are explained below.

In interpreting factors, a decision must be made regarding which factor loadings are worth considering (Hair *et al.*, 1998). The factor loading value is the relationship between the variable and the factor. The closer the factor loading is to 1, the stronger the relationship between the variable and the factor and the more significant the loading in interpreting the factor matrix (Hair *et al.*, 1998). According to Hair *et al.* (1998), factor loadings greater than ± 0.3 are considered to meet the minimum level of acceptance; ± 0.4 are to be considered more important; and the factor loadings are to be considered practically significant if the loadings exceed ± 0.5 or greater (Hair *et al.*, 1998). Whereas, Bryman and Cramer (1994) suggest 0.4 as a significant and acceptable factor loading in studies, where the numbers of respondents are relatively large (100 or larger). Hair *et al.* (1998) contend that studies with 100 or larger samples should follow the guidelines set out above. Thus, due to the sample size of this study (128 respondents), it was decided that the threshold level for the acceptance of factor loadings should be ± 0.5 as suggested by Hair *et al.* (1998). Factors will therefore be dropped when loadings are less than 0.5, or the loadings are more than one. However, some justifications need to be given in those instances where the researcher wants to retain the cross loading of a factor because this might give an important value for the dimension. For example, the best way to choose the cross loading factor is by looking which factor represents the highest weight amongst the cross loading factors.

Another mode to improve the interpretation of factors is by using factor rotation. Rotation works by changing the absolute values of the variables and, simultaneously, keeping the differential values constant (Field, 2005). This means maximising the loading of each variable on one of the extracted factors, whilst minimising the loading on all other factors (Field, 2005). The purpose of rotation is to obtain results that are more parsimonious, interpretable and

more likely to be replicated by future researchers (Gorsuch, 1983; Rennie, 1997). Due to this, the selection of rotation of factors of either oblique or orthogonal is essentially important in getting the best results. The approaches of orthogonal rotation are Quartimax, Varimax and Equimax whereas the approaches for oblique rotation method are Oblimin, Promax, Orthoblique, Dquart, Doblmin (Hair *et al.*, 1998). Both methods of rotation are employed to simplify the rows and columns of the factor matrix to facilitate interpretation (Hair *et al.*, 1998). However, the selection of rotation method is heavily dependent on the relations of the underlying factors.

In rotation selection, first of all, the researcher needs to decide whether the factors to be correlated (*i.e.* oblique rotation) or uncorrelated with one another (*i.e.* orthogonal rotation). Next, the researcher needs to clarify the results upon the rotation of factors. If the researcher is more interested in the generalisability of his/her results, then orthogonal rotation should be conducted; alternatively, rotation of the factors should be done obliquely if the researcher primarily concern with getting results that best fit his/her data (Rennie, 1997).

With regards to this research, the purpose of this research is to be able to generalise the findings, and as a result, orthogonal rotation should be conducted in this research. As such, orthogonal rotations are recommended because "*orthogonal rotations have the advantage of simplicity*" (Pedhazur & Schmelkin, 1991:615) and the results of orthogonal rotation are more replicable, interpretable and parsimonious (Gorsuch, 1983; Rennie, 1997).

Since the purpose of rotation is to simplify interpretation of the factors, it may appear, at first that the logical choice in this rotation of factors is varimax. The benefit of using a varimax rotation is to minimize the complexity of the components by making the large loadings larger and the

small loadings smaller within each component (Stevens, 1996). Varimax rotation produces factors that have high correlations with one smaller set of variables and little or no correlation with another set of variables (Stevens, 1996). By using a varimax rotation, the interpretation of the factors is uncomplicated compared to other types (*i.e.* equimax or quartimax) of rotation (Pallant, 2007).

The final results of the principal component analysis, which presents the details of the eigenvalues and factor loadings, are illustrated according to subdivision on the conceptual model of this study. The results of this analysis start with an examination of principal component analysis on managerial factors and organisational improvisation; followed by organisational factors; and external factors and firm performance.

6.2.1. Principal Component Analysis of Organisational Improvisation and Managerial Factors

The result for extraction of components for organizational improvisation and managerial factors (rational reasoning, intuitive reasoning, manager's self-confidence, manager's risk taking and expertise demonstrates that seven factors were extracted from the analysis with eigenvalue of more than 1. The eigenvalue of each organisational improvisation and the managerial factors are as depicted in Table 6-2.

**TABLE 6-2: PRINCIPAL COMPONENT ANALYSIS OF ORGANISATIONAL
IMPROVISATION AND MANAGERIAL FACTORS**

	Component						
	Rational	Intuition	Confidence	Risk taking	Creativity	Spontaneity	expertise
Reason_10	.816						
Reason_6	.814						
Reason_5	.803						
Reason_7	.798						
Reason_2	.744						
Reason_8	.703						
Reason_14	.657						
Reason_12	.615						
Reason_16		.924					
Reason_17		.913					
Reason_18		.894					
Reason_15		.837					
Confidence_2			.829				
Confidence_1			.768				
Confidence_3			.723				
Confidence_4			.625				
Risk_3				.799			
Risk_2				.724			
Risk_1				.722			
Improvisation_6.					.791		
Improvisation_7.					.718		
Improvisation_5.					.602		
Improvisation_4.					.535		
Improvisation_2.						.808	
Improvisation_1.						.771	
Improvisation_3.						.656	
Expertise_3							.781
Expertise_1							.648
Expertise_2							.515
Eigenvalues	7.845	4.101	3.027	1.569	1.514	1.215	1.088
% of variance explained (68.725%)	27.053	14.142	10.438	5.221	4.930	4.191	3.751

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

aRotation converged in 6 iterations.

The Rational Experiential Inventory (REI) was used in measuring the reasoning factor. From the principal component analysis of twenty reasoning variables (as illustrated in Table 6-2), two components demonstrate an eigenvalue greater than 1 which loads onto the first and second component in

this component analysis. Eight variables tap onto the first factor loading, namely rational reasoning, which represents an eigenvalue of 7.845 and explains 27.053% of total variance. All eight variables load from fairly good to fairly strong; with the scores ranging from 0.625 to 0.829.

In the second factor solution, only four variables load on the intuitive reasoning factor. The result of principal component analysis of this factor showed an eigenvalue of 4.101 while explaining 14.142% of total variance. All variables load very strongly onto the factor with factor loading scores ranging from 0.837 to a maximum of 0.924.

The remaining seven variables have been deleted due to four of them reporting a factor loading of less than 0.5 and four variables cross loading. The deleted variables are variable 1 (challenge thinking abilities), variable 3 (prefer complex problems), variable 4 (little satisfaction), variable 9 (the idea of relying on thought), variable 11 (prefer a task that is intellectual, difficult, and important), variable 13 (enough for me that something gets the job done), variable 19 (have clear visual images of things), and variable 20 (good at visualizing things).

Following to this, manager's self-confidence is found to load as the third factor loading in this principal component analysis. The extraction onto one factor loading confirmed the result that all variables can be summarised onto one construct. All four variables load onto self-confidence factor with an eigenvalue of 3.027 while explaining 10.438% of the variance. Loading scores are significantly high with scores ranging from 0.630 to a peak of 0.825.

Next, the principal component analysis of individual managerial attitude towards risks is found to load at fifth component. Three variables for attitude towards risks have been adapted from McKibbon *et al.* (2007). These

three variables load onto each component. The risk taking component demonstrates an eigenvalue of 1.569 while explaining 5.221% of total variance. All variables load strongly with scores ranging from 0.722 to a peak of 0.799.

In measuring organizational improvisation, seven variables have been adapted from Vera and Crossan (2005). According to Vera and Crossan (2005), the components of organizational improvisation are derived from creativity and spontaneity. Thus, this result reveals the variables are loaded onto two separate factor loadings. Four variables form the first factor namely creativity demonstrates an eigenvalue of 1.514 while explaining 4.930% of variance. Whereas three variables construct the second (spontaneity) factor that demonstrates an eigenvalue of 1.215 while explaining 4.191% of variance. All variables on each factor load fairly strongly onto the factor with factor loading scores ranging from 0.535 to a peak of 0.808.

Lastly, the individual manager's expertise represents the last component in this analysis. Three variables for individual manager's expertise have been adapted from Vera and Crossan (2005). The analysis reported an eigenvalue of 1.088 while explaining 3.751% of total variance. All variables load reasonably well with the factor loading scores ranging from 0.515 to 0.781.

6.2.2. Principal Component Analysis of Organisational Factors

In this study, another influential factor that needs to be analysed is the organizational factor. All variables were adapted from previous research (*see Chapter 4 for details explanation*). Six components have been used in determining the organisational factors that affect organisational improvisation. In this component analysis, the test has been divided into two parts which mainly focuses on the structure and organisational characteristics, and information processing part. The structure part consists of clarity of goal,

minimal structure, organisational flexibility; and an organizational orientation toward risks factor. Meanwhile the information processing part consists of organisational information and communication; and organisational memory factor. The result of the component analysis of organisational factor demonstrates that from twenty seven variables, the factors form onto four components (see Table 6-3).

TABLE 6-3: PRINCIPAL COMPONENT ANALYSIS OF ORGANISATIONAL FACTOR

	Component					
	Flexibility	Structure	Goal	Memory	Information	Risk
Flexibility_10	.819					
Flexibility_9	.795					
Flexibility_5	.787					
Flexibility_2	.773					
Flexibility_8	.761					
Flexibility_4	.760					
Flexibility_7	.749					
Flexibility_12	.737					
Flexibility_6	.680					
Flexibility_3	.666					
Flexibility_2	.608					
Organizational structure_3		.845				
Organizational structure_4		.775				
Organizational structure_6		.752				
Organizational structure_5		.717				
Organizational structure_2		.683				
Organizational structure_1		.637				
Organizational goal_2			.867			
Organizational goal_1			.865			
Organizational goal_3			.851			
Memory_4				.762		
Memory_3				.750		
Memory_2				.607		
Information_2					.754	
Information_3					.749	
Information_4					.672	
Organisational risk_4						.849
Organisational risk_3						.711
Organisational risk_1						.663
Organisational risk_2						.647
Eigenvalues	9.957	3.632	2.673	1.811	1.415	1.077
% of variance explained (68.545%)	33.190	12.105	8.909	6.037	4.715	3.589

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

aRotation converged in 7 iterations.

The first factor loads onto the flexibility component with an eigenvalue of 9.957, which explains 33.190% of total variance. Originally, there were thirteen variables used to explain this component. However, after running the component analysis, four variables (variable 1: explore a wide variety of approaches to a problem; and variable 13: react quickly to new product-market threats) were eliminated due to cross loadings of factors and thus eleven variables were coalesced to form the flexibility component. All eleven variables reported fairly strong factor loadings ranging from 0.608 to 0.819.

Organisational structure is then formed as a second factor loading, which produces an eigenvalue of 3.632 while explaining 12.105% of total variance. These six variables were confirmed to be representing the minimal structure component with all variables loadings satisfactory, with scores ranging from 0.637 to 0.845.

The third factor loading is clarity of goal. From this component analysis, the results confirmed that all three factors should be used to form this component due to all variables loading strongly, with scores ranging from 0.851 to 0.867 and an eigenvalue of 2.673, 8.909% of total variance explained by the factor.

Following to this, factor loading contains of four variables of organisational memory component. Originally, there were four variables used to explain this component. However, variable 1 (*up-to-date information through meetings*) was eliminated due to cross loading. These three factors thus reports an eigenvalue of 1.811 while explaining 6.037% of total variance, all variables loadings are satisfactory with the factor scores ranging from 0.607 to 0.762.

Next, an organisational information component loads as the fifth factor. From four variables, one variable was eliminated due to cross loading. The

final three variables loadings ranging from 0.672 to 0.754 and an eigenvalue of 1.415, while explaining 4.715% of total variance.

Finally, an organizational orientation towards risk taking loads as the six factors, with an eigenvalue of 1.077 while explaining 3.589% of total variance. This component was formed through four variables. All variables load fairly strongly with the factor scores ranging from 0.647 to 0.849.

6.2.3. Principal Component Analysis of Firm Performance and Environmental Turbulence

The principal component analysis of firm performance and environmental turbulence is illustrated in Table 6-4.

TABLE 6-4: PRINCIPAL COMPONENT ANALYSIS OF FIRM PERFORMANCE AND ENVIRONMENTAL TURBULENCE

	Component			
	Firm Performance	Competitive Turbulence	Technological Turbulence	Market Turbulence
Performance_2	.870			
Performance_1	.826			
Performance_5	.822			
Performance_4	.805			
Performance_3	.805			
Competitive turb_4		.814		
Competitive turb_5		.814		
Competitive turb_2		.775		
Competitive turb_3		.755		
Competitive turb_1		.744		
Technological turb_2			.867	
Technological turb_3			.826	
Technological turb_1			.823	
Technological turb_4			.691	
Market turb_1				.750
Market turb_2				.739
Market turb_3				.712
<i>Eigenvalues</i>	4.840	3.423	2.091	1.188
<i>% of variance explained (67.893%)</i>	28.469	20.134	12.301	6.990

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
aRotation converged in 5 iterations.

The last principal component analysis is employed to investigate firm performance and environmental turbulence measures. As can be seen in Table 6-4, the result confirmed that all five variables form the firm performance component with an eigenvalue of 4.840 while explaining 28.496% of total variance. The value of each variable demonstrates very strong factor loadings with scores ranging from 0.805 to 0.870.

Next, the analysis of environmental turbulence has been adapted from Jawoski and Kohli, 1993; Moorman and Miner, 1997; and Akgun *et al.*, 2007. This analysis confirmed that the environmental turbulence construct was formed through three different components, namely competitive turbulence, technological turbulence and market turbulence. In the competitive turbulence component, five variables load fairly strongly with the factor scores ranging from 0.744 to 0.814. Only one variable (variable 6: our competitors are weak) was deleted due to a factor score below 0.5. These five variables form the competitive turbulence component with the factor explains 20.134% of total variance whilst exhibiting an eigenvalue of 3.423. The technological turbulence component loads as the third factor with the scores ranging from 0.691 to 0.814 and reports an eigenvalue of 2.091 while explaining 12.301% of total variance. Finally, the component analysis reports that three variables form the market turbulence component with an eigenvalue of 1.188 while 6.990% of total variance explained. The value of all factor loadings was fairly good with the factor scores ranging from 0.712 to 0.750.

6.3. Investigating Scale Reliability through Cronbach Alpha

Reliability is an assessment of the degree of consistency between multiple measurements of a variable (Hair *et al.*, 1998). For example, the respondent should respond in the same way if they answer the questionnaire

at two different points in time (test-retest). The objective is to guarantee that a measurement taken at any point in time is reliable (Hair *et al.*, 1998). Hair *et al.*, (1998) suggest that the most commonly used method to measure scale reliability is by using internal consistency. Most management and strategy literatures use Cronbach Alpha as the assessment of scale reliability; for instance Jawoski and Kohli (1993), Akgun and Lynn (2002), Vera and Crossan (2005), Falshaw *et al.* (2006), Akgun *et al.* (2007), and Leybourne and Sandler-Smith (2007). The rationale for internal consistency is that the individual items or indicators of the scale should be measuring the same construct and consequently should be highly intercorrelated (Hair *et al.*, 1998). Thus, the use of Cronbach Alpha as a method to be adopted to assess scale reliability in this study is justified.

The Cronbach Alpha relates to the mean correlation between each pair of items and the number of items in the scale (Brace *et al.*, 2006). This means that the coefficient alpha is equal to 1 if all tested items are measured according to true score and perfectly reliable, while at another point, coefficient alpha is equal to zero if it appears the error in the items such as the items are uncorrelated across subjects. Nunnally (1978) proposes that a scale should have a minimum Cronbach alpha value of 0.70. However, some researchers contend that it may decrease to 0.60 in exploratory research (Hair *et al.* 1998). In this study, the reliability score at or more than the 0.07 threshold, recommended by Nunnally (1978) is used to determine the reliability of the item constructs. The Cronbach Alpha statistics for all scales are shown in Table 6-5.

Based on this analysis, all items appeared to be worthy for retention. All fifteen factors demonstrate Cronbach alpha scores higher than the 0.70

threshold of acceptability. The scores range from the average acceptable value of 0.702 to the highly reliable value of 0.949.

TABLE 6-5: THE RELIABILITY TEST THROUGH CRONBACH ALPHA

Component	N of variables	Cronbach Alpha
1. Improvisation	7	0.783
2. Reasoning Factor	14	0.923
3. Manager's self confidence	4	0.896
4. Managerial expertise	3	0.867
5. Manager's attitude towards risk	3	0.702
6. Individual Flexibility	9	0.778
7. Organizational risk-taking	4	0.933
8. Real-time information	4	0.730
9. Procedural Memory	4	0.806
10. Organizational Goal	3	0.874
11. Minimal Structure	6	0.949
12. Technological turbulence	4	0.838
13. Market turbulence	3	0.849
14. Competitive turbulence	5	0.706
15. Firm Performance	5	0.857

6.4. Construction of Summated Scale

Now the factor analysis has been completed and the reliability of the item constructs has been confirmed, the results are used as the source for the construction of summated scales. The summated scale score can portray complex concepts in a single measure while reducing measurement error (Hair *et al.*, 1998). It is crucial to this study because the summated scales can give a valuable addition in any multivariate analysis, specifically in hypothesis testing (Hair *et al.*, 1998; Churchill, 1999; de Vaus, 2002). Extant behavioural, organizational and marketing literatures have suggested and used this approach for research, such as Gerbing and Anderson (1988), Piercy

(1989), Morgan *et al.* (2000); Hult *et al.*, (2004), Hughes and Morgan, (2007; 2008) in constructing a single summary measure of underlying constructs.

The summated scales are constructed by combining several individual variables that are supposed to describe the same phenomenon into a single composite measure (Hair *et al.*, 1998). A statistical package (SPSS version 16.0 for Windows) is used to combine and compute the variables. This analysis can be achieved by using the 'Compute Variable' function within the 'Transform' menu. The average score can be constructed by summing up all variables that form the factor and then divided by the number of particular variables. A new replacement variable is labelled with the new name according to the underlying item constructs. In this study, the new replacement variable will be used to test the item-total correlation in order to investigate further validation of the item constructs, before the researcher starts testing the hypotheses.

6.5. Investigating Scale Validity through Item-Total Scale Correlation

An examination of validity can also be proved through correlation analysis, specifically, in examining the correlation between theoretically defined sets of variables (Hair *et al.*, 1998). Such correlation has previously been investigated in the factor analysis by examining the test of KMO and Bartlett test of sphericity. However, it is possible to investigate validity further by using other methods in assessing the validation of item constructs. Pallant (2007) noted that there is no absolute way to validate the data. However, Hair *et al.* (1998) suggest that convergent validity can be examined by looking for alternative measures of a concept and then correlating them with the summated scale.

The item-total scale correlation is one of the methods that can be used in this study to examine the correlation between each item measure and the

summated scale score. This procedure has been applied in numerous studies from extant literature, which use item-total correlation for testing the internal validity of each scale (*for example*, Narver and Slater, 1990; Jaworski and Kohli, 1993; Morgan and Strong, 2003). The item-total scale correlation statistics for the variables of each scale are shown in Table 6-6.

The results of the assessment of all item-total correlation statistics was investigated using Pearson's correlation coefficient. After assessing the construct validity and reliability of the study variables, it is confirmed that seventy eight variables will be used for the construction of the underlying dimensions. As can be seen in Table 6-6, there is a highly significant ($p < 0.01$) relationship between each item measure and the summated scale score. These results thus prove that all item constructions are both valid and appropriate and can be used for further analyses in hypotheses testing.

TABLE 6-6: THE ITEM-TOTAL SCALE CORRELATION STATISTICS

Scale and Constituent Variables	Item-Total Scale Correlation
<i>Organisational Improvisation</i>	
1. deal with unanticipated events	.637**
2. think on my feet	.605**
3. respond in the moment	.756**
4. try new approaches to problems	.753**
5. take risks when producing new ideas	.626**
6. demonstrate originality	.679**
7. identify opportunities	.622**
<i>Reasoning Factor</i>	
1. requires a lot of thinking	.775**
2. thinking is not my idea of fun	.763**
3. the notion of thinking	.821**
4. understanding the reasons for the answer to a problem	.792**
5. don't reason well under pressure	.721**
6. the idea of relying on thought	.795**
7. learning new ways to think	.810**
8. prefer to accept things as they are	.816**
9. enough for me that something gets the job done	.619**
10. difficulty thinking in new and unfamiliar situations	.716**
11. initial impressions of situations are almost always right	.850**

12. trust my initial feelings	.936**
13. believe in trusting my hunches	.919**
14. very intuitive person	.899**
<i>Individual Managerial Factor</i>	
1. make and execute a strategic plan simultaneously	.833**
2. engage in spontaneous actions	.865**
3. make intuitive judgments	.858**
4. improvise when the company facing uncertainty	.827**
5. aware of critical managerial issues	.815**
6. knowledgeable about work	.756**
7. knowledge in diverse fields	.811**
8. enjoy taking risks	.823**
9. not bother to take risks	.815**
10. people told - enjoy taking risks	.866**
<i>Organisational Factor</i>	
1. up-to-date information through meetings	.850**
2. readily shared information within organization	.872**
3. receive information about other departments' activities	.829**
4. information on external environment	.845**
5. well-defined procedures	.915**
6. keep records of past projects	.919**
7. information systems to support work	.885**
8. up-to-date files and databases	.864**
9. little action taken until a superior makes a decision	.660**
10. own decisions would be discouraged	.704**
11. small matters have to be referred to someone with more authority	.848**
12. any decision has to have boss's approval	.782**
13. People follow written work rules	.725**
14. things are done is never left up	.736**
15. clear vision of the target market	.956**
16. clear understanding of target customers' needs and wants	.950**
17. Overall business goals are clear	.951**
18. create multiple courses of action	.734**
19. adjust well to new equipment, process, or procedures	.818**
20. adapt personal approach to the situation at hand	.793**
21. adapt to change with minimal stress	.782**
22. consider to be a flexible person	.773**
23. adapt company strategy adequately to changes in the business environment	.851**
24. adapt company strategy adequately to changes in competitors' product-market strategies	.822**
25. adapt company strategy quickly to the changing needs of customers	.813**
26. react quickly to new product-market threats	-.645**
27. heavy reliance on innovation	.737**
28. high debt financing	.664**
29. heavy R&D	.750**
30. high risk, high return investments	.851**
<i>Environmental Turbulence</i>	
1. technology used changing rapidly	.831**
2. relevant technology changing rapidly	.859**
3. technological breakthroughs in the industry	.850**
4. Technological changes provided big opportunities	.778**

5.	changes of customers' preferences	.735**
6.	customers tend to look for new products all the time	.820**
7.	witness demand from new customers	.823**
8.	competition is cut-throat	.773**
9.	many 'promotion wars'	.803**
10.	competitors can readily match	.779**
11.	price competition is a hallmark	.829**
12.	new competitive move almost every day	.812**
Company Performance		
1.	Long term profitability	.833**
2.	Sales growth	.880**
3.	Financial resources (liquidity and investment capacity)	.799**
4.	Public image	.821**
5.	Client loyalty	.826**

***. Correlation is significant at the 0.01 level (2-tailed).*

6.6. Concluding Remarks

This chapter has specifically examined dimensionality, the validity and reliability of all underlying item constructs. An exploratory factor analysis has been used to assess summarization and validation of the data. In the factor analysis, the result of overall KMO measure of sampling adequacy revealed that all scores are above the 0.5 threshold level for acceptability; and the Bartlett's test of sphericity shows highly significant relationships among all variables within a correlation matrix, thus enabling the principal component analysis to be carried out. In the final results of principal component analysis, the eigenvalues and the value of all factor loadings are presented in accordance with the subdivision in the conceptual model. After confirming all factorability and validity of the data, Cronbach Alpha was used to examine construct reliability. Sixteen factors revealed the reliability of item constructs with Cronbach alpha scores above the recommended 0.70 threshold for acceptability (as suggested by Nunally, 1978). After examining the validity and reliability of the data, the summated scales were developed for further use in the hypotheses testing. The validity was then tested again using item-total correlation analysis in order to gain additional evidence of the validation of all item constructs that will be used for further empirical analyses.

Hypotheses Testing

7.1. Introduction

After confirming the validity and reliability of all item constructs in the previous chapter, this chapter proceeds with the examination of the research hypotheses as per the developed model. Prior to examining the research hypotheses, data screening is conducted using descriptive and correlation analysis. After all the data has been examined, multiple regression analysis is then employed to test the research hypotheses. Standard regression analysis is used to test *hypotheses 1 – 11*, while hierarchical regression analysis is employed to test *hypotheses 12– 15*. In the analysis, all assumptions made are checked to ensure that each test falls within the ranges of acceptability.

7.2. Data Screening through Descriptive and Correlation Analysis

Data screening procedures are performed using the newly-constructed summated scales. As suggested by Tabachnick and Fidell (2001), descriptive analysis and correlation analysis is employed to screen all of the data before hypotheses testing. Descriptive analysis is used to examine the mean, standard deviation and the distribution of the data, particularly in observing the univariate and multivariate outliers. In addition, correlation analysis is used to assess the strength and direction of the linear relationships between two variables (Pallant, 2007). The strength of the relationship is derived from Pearson's correlation coefficients on a range of -1 to +1; a correlation of zero indicates no relationship between two variables, while a positive value indicates a positive relationship and a negative value represents a negative

relationship. Once the direction of the relationship is established it is necessary to ascertain the significance of that relationship (Pallant, 2007). According to Pallant (2007), the significance level indicates the level of confidence the researcher should have in the result obtained and typically should not be taken beyond 10% significance. Correlation analysis is important in this study as it serves as an early stage of investigation of the accuracy of the model hypotheses.

The correlation matrix and descriptive statistics are illustrated in Table 7-1. Assessment of the correlation matrices reveal that high inter-correlations exist between most variables ($p < 0.05$ and $p < 0.01$). For instance, the majority of variables are associated with organisational improvisation except for intuitive reasoning, and organisational structure. This is also the case for performance where most variables show a positive significant relationship with this factor, excluding rational and intuitive reasoning factors, organisational structure and technological turbulence. The results illustrate that the majority of variables used in this study are correlated and therefore provides an early means of establishing the accuracy of the research hypotheses and research model prior to hypotheses testing.

In terms of the descriptive analysis, the mean scores of all variables range from 4.457 to 5.932 with standard deviation values between 0.707 and 1.202. Meanwhile, the observations of all the kurtosis and skewness scores demonstrate that every variable is above the minimum acceptable threshold of 0.05, as suggested by Hair *et al.* (1998). The normality distribution can be affected if the critical value is below ± 1.96 at the probability level of 0.05. On the basis of the results it can be concluded that all variables are normally distributed and can thus be employed for further analyses.

TABLE 7-1: CORRELATION ANALYSIS

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Improvisation																
2. Rational	.349**															
3. Intuitive	.102	.022														
4. Confidence	.553**	.462**	.191*													
5. Individual Risk	.550**	.287**	.050	.478**												
6. Expertise	.467**	.421**	.140	.577**	.467**											
7. Goal	.239**	.253**	.036	.361**	.298**	.363**										
8. Structure	-.041	-.427**	-.032	-.253**	-.103	-.154	.031									
9. Flexibility	.571**	.437**	.167	.625**	.518**	.562**	.457**	-.160								
10. Org. Risk	.433**	.034	.055	.439**	.493**	.239**	.184*	-.090	.394**							
11. Information	.379**	.207*	.091	.407**	.485**	.445**	.475**	-.056	.470**	.178*						
12. Memory	.268**	.223*	-.019	.245**	.294**	.381**	.606**	-.056	.459**	.217*	.213*					
13. Tech. Turbulence	.342**	.033	.037	.240**	.406**	.193*	.134	-.067	.350**	.361**	.163	.080				
14. Market Turbulence	.373**	.067	.109	.253**	.336**	.228**	.114	.165	.372**	.360**	.196*	.005	.399**			
15. Comp. Turbulence	.308**	-.037	-.159	.053	.129	.002	.008	.202*	.089	.072	.035	.408**	.296**	.408**		
16. Firm Performance	.285**	.246**	-.027	.403**	.298**	.342**	.493**	.039	.362**	.247**	.362**	.557**	.138	.247**	.005	
<i>Mean</i>	5.395	5.356	4.531	5.373	4.966	5.654	5.768	4.405	5.001	4.457	4.964	5.604	5.932	5.261	4.834	5.166
<i>Std Deviation</i>	.795	.927	1.202	.897	1.016	.809	1.111	1.143	.689	1.101	1.105	1.031	.864	.890	1.187	1.006
<i>Skewness</i>	-.139	-.456	-.688	-.388	.101	-.433	-1.302	-.347	-.185	-.061	-.213	-.502	-.978	-.379	-.211	-.486
<i>Kurtosis</i>	-.477	.196	.913	-.122	-.445	.076	2.205	.157	-.430	-.119	.150	.179	.787	.264	-.620	.524

*Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed).

By examining the correlation matrix, we can observe that the results only explain the basic bivariate relationship between the variables in question; as such, correlation analysis cannot be used for predictive purposes (Meyers *et al.*, 2006) or in testing causation (Brace *et al.*, 2006), as we cannot infer which variable is causing which. Rather, we can merely observe that there is a relationship between the two variables in question. It is therefore necessary to investigate more precisely the association between the study variables; specifically by determining the multivariate relationships among the variables so as to then make judgements on the accuracy of the hypotheses and thus, achieve the research objectives of this study. The technique employed to achieve this is multiple regression analysis. By using this analysis, the researcher can robustly examine the effects of multiple independent variables on a given dependent variable, such as testing the effect of multiple factors on organisational improvisation.

7.3. Hypotheses Testing through Multiple Regression

Multiple linear regression analysis is widely used in business and management research to analyse the relationship between a single dependent (criterion) variable and several independent (predictor) variables (Hair *et al.*, 1998; Meyers *et al.*, 2006). Multiple regression analysis has a number of uses, firstly, in determining how well a set of variables is able to predict the particular outcome selected by the researcher; secondly, to address which variable in a set of variables is the best predictor of an outcome; thirdly to resolve whether a particular predictor variable is still able to predict an outcome when the effects of another variable are controlled for or act as a moderator (Hair *et al.*, 1998; Meyers *et al.*, 2006; Brace *et al.*, 2006; Pallant, 2007). Hair *et al.* (1998) noted that multiple regression analysis is a dependence technique. It requires the researcher to decide which variables will be selected to be the independent variables (predictor variables) and which will be the

dependent variables (variable being predicted). It is based on correlation analysis but allows a more sophisticated exploration of the interrelationship among a set of variables to investigate more complex real-life research questions (Pallant, 2007). This method of analysis can give greater explanation on how much of the variance in the dependent variable can be explained by the independent variables; and at the same time, the test can serve as an indication of the relative contribution of each independent variable (Pallant, 2007). It also allows the researcher to determine the statistical significance of the results regarding the model itself as well as the individual independent variables (Pallant, 2007).

The regression analysis has three major models namely standard regression, hierarchical regression and stepwise regression. Coakes and Steed (2003) note that these models are distinguishable in two ways; firstly, in the treatment of overlapping variability due to correlation of the independent variables; and secondly, in terms of order of entry of the independent variables into the equation. In standard multiple regression analysis, all independent (or predictor) variables are entered into the equation at once in order to examine the relationship between the whole set of independent variables and dependent variable; whereas in hierarchical regression, the researcher has to determine the order of entry of the independent variables based on theoretical grounds (Coakes and Steed, 2003; Pallant, 2007). In stepwise regression, a list of independent variables provided in SPSS are entered and the order of entry are determined by a set of statistical criteria generated by the stepwise procedure (Coakes and Steed, 2003; Pallant, 2007). However, standard multiple regression is most commonly used in extant empirical research because it examines the degree of variance in a dependent variable that can be explained as a group or block as well as to discover how

much unique variance in the dependent variable is attributable to each of the independent variable's (Pallant, 2007).

This study adopts standard multiple regression analysis to test *hypotheses 1* through to *11*, while hierarchical regression analysis is employed to test *hypotheses 12* through to *15*. This different approach is due to the different way of linking between the variables. *Hypotheses 1* through to *11* concern the direct relationship between those factors (the direct association between independent and dependent variables); meanwhile, *hypotheses 12* through to *15* attempt to identify the moderating factor that affects the link between the independent and dependent variables.

In order to get more accurate, trustworthy and significant results, a number of assumptions were checked once the researcher sought to carry out the regression analysis (Osborne and Waters; 2002). For that reason, a number of assumptions are assessed through regression analysis such as ratio of cases to independent variables, multicollinearity, outliers, normality, linearity, homoscedasticity and independence of residuals (Hair *et al.*, 1998; Tabachnick and Fidell, 2001; Coakes and Steed, 2003; Brace *et al.*, 2006; Pallant, 2007).

The first assumption that needs to be checked is the ratio of cases to independent variables. The number of cases needed depends on the type of regression model to be used. Different authors tend to give different recommendations and guidelines on the number of cases required for multiple regression analysis. According to Pallant (2007) and Tabachnick and Fidell (2001), the calculation for the required sample size is equivalent to the total sample size, which must be greater than [50 cases + (8 cases x number of independent variables to be used)]. On the other hand, Steven (1996) noted that fifteen cases per predictor are sufficient to reach a reliable equation in testing the regression analysis.

In this study, the test of this assumption follows the guideline provided by Coakes and Steed (2003) where they suggest that the researcher needs to have at least five times more cases than independent variables as a minimum requirement when running standard multiple regression; or twenty times more cases than predictors when running hierarchical regression. In the regression analysis, the number of independent variables for each test employed is eleven, it is then estimated that the minimum numbers of cases needed is 55 cases. Meanwhile, in the hierarchical regression analysis, the number of predictors is three, so it is estimated that the number of cases needed is 120 cases. As the final sample size of this study is 128, it is therefore considered that this number is sufficient to proceed to the next stage of analysis.

The second assumption to be assessed is variable multicollinearity and singularity. Multicollinearity refers to high correlations among the independent variables whereas singularity occurs when perfect correlation among independent variables exists. These assumptions can be checked through the correlation matrix, squared multiple correlations and tolerance scores. For example, multicollinearity can be checked through the value of correlations between each of the independent variables and the correlated relationship between the independent variables and the dependent variable must be less than 0.7. The correlation analysis confirmed that all correlations were less than 0.7 (*see* Table 7-2). Tolerance scores and variance inflation factor (VIF) values were also checked for determining the presence of multicollinearity. As suggested by Pallant (2007), the threshold of acceptability is 0.10, or a VIF value of above 10. This was achieved by all the study variables examined. Hence, all variables were retained since multicollinearity and singularity are assumed not to be present.

The third assumption to be tested is in detecting outliers in the data. This assumption can be checked through examining the Normal Probability Plot (P-P) of the regression standardised residuals, the scatterplot, Mahalanobis distances and Cook's distances (Pallant, 2007). In the Normal P-P Plot, Pallant (2007) suggests that the data is normally distributed if the points lie in a reasonably straight diagonal line from bottom left to top right. Whilst in the scatterplot of the standardised residuals, the residuals must be of a rough rectangular distribution with most of the scores concentrated in the centre (along the 0 point) and plotted in the range of -3.3 to 3.3 (Pallant, 2007; Tabachnick and Fidell, 2001). This analysis proves that all data is normally distributed because there are no outliers detected from an examination of the P-P Plot and scatterplot. All P-P plot diagrams show a straight diagonal line from bottom left to top right, while all the scatterplot diagrams ranged between -3.3 to 3.3.

One more way to check for outliers is by inspecting Mahalanobis distances and Cook's distances. According to Pallant (2007), Mahalanobis distances can be determined by the critical chi-square value where the value must not exceed the critical chi-square value of 13.8 at an alpha of 0.001; whereas the Cook's distances value must not be greater than 1. Based on the inspection of Mahalanobis distances in this study, some hypotheses are shown to have values greater than 13.8. However, these are select cases, which account for less than 1 percent of the total cases examined. Nevertheless, it is appropriate to confirm whether these cases need to be removed by counterchecking all these cases through Cook's distances. From this analysis, all values satisfied the threshold of acceptability, thus confirming that the abovementioned cases did not have a biasing influence on the results and can be retained for further analysis.

7.3.1. Hypothesis Testing on the Relationship between Managerial Factors and Organisational Improvisation

The results on *hypotheses* 1 through to 11 was tested using a standard multiple regression analysis. The result of the relationship between all the independent variables (managerial and organisational factors) and organisational improvisation is illustrated in Table 7-2. The result shows a total of 49.4% of the variance in organisational improvisation is explained by eleven factors (rational reasoning; intuitive reasoning; manager's self-confidence; manager's expertise; organisational goal; organisational structure, organisational flexibility; organisational risk, organisational information; organisational memory), which is significant as indicated by the F-value of 10.303. However, if referred individually, some variables do not report a significant relationship. The details of the analyses results are as depicted in Table 7-2 and the thorough explanations on each hypothesis tested follows next.

TABLE 7-2: REGRESSION ANALYSIS FOR HYPOTHESIS 1 THROUGH TO 11

Dependent Variable			
Improvisation	<i>Variables</i>	<i>Hypothesis</i>	<i>Improvisation (β)</i>
Independent			
Variable	Rational reasoning	H1	0.157*
	Intuitive reasoning	H2	0.001
	Manager's self-confidence	H3	0.189*
	Manager's expertise	H4	0.068
	Manager's risk taking	H5	0.205**
	Organisational goal	H6	0.135
	Organisational structure	H7	0.072
	Organisational flexibility	H8	0.224**
	Organisational risk	H9	0.163*
	Organisational information	H10	0.164**
	Organisational memory	H11	0.013
<i>Summary statistics</i>		R ²	0.494
		F	10.303
		P	0.000

Notes: * $p < 0.1$; ** $p < 0.05$

7.3.1.1. Hypothesis Testing on the Relationship between Managerial Factors and Organisational Improvisation

The first hypothesis concerns the relationship between reasoning factors and organisational improvisation. This study predicts that the manager's reasoning process will affect the execution of organisational improvisation. It is deemed crucial to examine this relationship as; to the best of the researcher's knowledge no empirical study has yet tested this relationship. This hypothesis is constructed in order to identify whether reasoning processes (either rational or intuitive) can have a significant effect on organisational improvisation.

The reasoning process is suggested to act as an independent variable while organisational improvisation forms the dependent variable. Based on theoretical perspectives, the reasoning process can diverge onto two modes of reasoning; the rationality and intuition. For this reason, the researcher needs to test whether both factors significantly affect the incidence of organisational improvisation. Hence, constituent *Hypothesis 1* and *Hypothesis 2* were developed as follows:

Hypothesis 1: The greater the rationality of manager's reasoning process, the lesser the incidence of organisational improvisation.

Hypothesis 2: The greater the manager's intuitive reasoning process, the stronger the incidence of organisational improvisation.

The result of the relationship between the strategic reasoning process and organisational improvisation is illustrated in Table 7-2. The result of *Hypothesis 1* demonstrates that rational of reasoning is positively associated with the incidence of organisational improvisation, thus **refuting *Hypothesis***

1. Meanwhile, intuitive reasoning is not significantly associated with the incidence of organisational improvisation; thus ***Hypothesis 2 is not supported.***

Next, this study tries to investigate the relationship between individual manager's characteristics and organisational improvisation. These relationships are examined in *Hypothesis 3, 4 and 5* which specifically analyse the effect of three individual managerial factors on organisational improvisation. These factors include the manager's level of self-confidence, their degree of expertise and the manager's attitude towards risks. The proposed hypotheses were as follows:

Hypothesis 3: The greater the manager's level of self-confidence, the stronger the levels of organisational improvisation.

Hypothesis 4: The greater the manager's expertise, the stronger the organisational improvisation.

Hypothesis 5: The greater the manager's attitude towards risk, the stronger the organisational improvisation.

In this study, all three individual manager's factors were performed as the independent variable. As can be seen in Table 7-2, the results demonstrate the regression analyses for *Hypotheses 3 through to 5* concerning the individual manager's factors contributing to effective organisational improvisation.

As illustrated in Table 7-2, the result shows that manager's self-confidence and manager's attitude towards risk positively and significantly affect organisational improvisation, thus ***Hypothesis 3 and Hypothesis 5 are supported.*** However, the manager's expertise does not appear to influence organisational improvisation, therefore, ***Hypothesis 4 is not supported.***

7.3.1.2. Hypothesis Testing on the Relationship between Organisational Factors and Organisational Improvisation

The next set of hypotheses tests investigate the relationship between organisational factors and organisational improvisation. Much theoretical research suggests that organisational factors could contribute to a significant effect on organisational improvisation (e.g. Moorman and Miner, 1998; Akgun and Lynn, 2002; Cunha *et al.*, 2002) and indeed, the 'strategy as process' theory suggests organisational factors are critical components that affect strategy formation (and hence, improvisation in this case). Analysis of the organisational factors was segregated into two parts. The first part focuses on organisational characteristics and behaviour; and the second part focuses on information processing within the organisation. Specifically, organisational characteristics and behaviour were categorised into four dimensions. The details of the hypotheses are as follows:

Hypothesis 6: The greater the clarity of the goal, the stronger the organisational improvisation

Hypothesis 7: The greater the organisational structure, the stronger the organisational improvisation.

Hypothesis 8: The greater the firm's flexibility, the stronger the organisational improvisation.

Hypothesis 9: The greater the firm's risk-taking, the stronger the organisational improvisation.

Table 7-2 presents the results of the regression analyses for *Hypotheses 6 through to 11* relating to organisational factors that affect organisational

improvisation. The results demonstrate that firm's flexibility and firm's risk taking are found to have a significant effect on organisational improvisation, thus *Hypothesis 8* and *Hypothesis 9* are supported. However, clarity of goal and organisational structure are non-significant, therefore *Hypothesis 6* and *Hypothesis 7* are not supported.

The next hypothesis test of the relationship between organisational factors and organisational improvisation, examines the degree of information processing within the organisation. It was assumed that organisational information, as well as organisational procedural memory processes among members of the group within an organisation, will contribute to having a significant effect on organisational improvisation. From this, it was hypothesised that:

Hypothesis 10: The greater the organisational information, the greater the organisational improvisation.

Hypothesis 11: The greater the organisational memory, the greater the organisational improvisation.

The regression analysis for *Hypothesis 10* and *11* is illustrated in Table 7-2. The results show that only organisational information factor reports a significant relationship, thus *Hypothesis 10* is supported; whilst *Hypothesis 11* is not significant, thus *Hypothesis 11* is not supported.

7.3.2. Hypothesis Testing on the Relationship between Environmental Turbulence, Organisational Improvisation and Firm Performance

Hierarchical regression analysis was used to test the remaining hypotheses. By using hierarchical regression analysis, the variables were entered in steps or blocks in a predetermined order. The environmental turbulence factors acted as the moderating variables between organisational improvisation (independent variable) and firm performance (dependent variable). These three variables are technological turbulence, market turbulence and competitive turbulence. The following hypotheses were proposed:

Hypothesis 12: The greater the organisational improvisation, the stronger the firm performance.

Hypothesis 13: The stronger the technological turbulence, the stronger the relationship between organisational improvisation and firm performance.

Hypothesis 14: The stronger the market turbulence, the stronger the relationship between organisational improvisation and firm performance.

Hypothesis 15: The stronger the competitive turbulence, the stronger the relationship between organisational improvisation and firm performance.

A hierarchical regression analysis was used to test these four hypotheses as well as to check whether the three environmental turbulence factors have a significant moderating effect between organisational improvisation and firm performance. The equations for this hierarchical regression test are as follows:

$$Y_1 = \alpha + \beta_1 X$$

$$Y_2 = \alpha + \beta_1 X + \beta_2 M_{tech} + \beta_3 M_{mkt} + \beta_4 M_{comp}$$

$$Y_3 = \alpha + \beta_1 X + \beta_2 M_{tech} + \beta_3 M_{mkt} + \beta_4 M_{comp} + \beta_5 Z_1 + \beta_6 Z_2 + \beta_7 Z_3$$

Y = firm performance as dependent variable

X = organisational improvisation as independent variable

M_i = summated score of individual response minus the mean score of overall responses; where i is variable for *imp*, *tech*, *mkt*, *comp*.

**imp*=improvisation; *tech*=technological turbulence; *mkt*=market turbulence; *comp*=competitive turbulence.

$$Z_1 = M_{tech} \times M_{imp}$$

$$Z_2 = M_{mkt} \times M_{imp}$$

$$Z_3 = M_{comp} \times M_{imp}$$

TABLE 7-3: REGRESSION ANALYSIS FOR HYPOTHESIS 12 THROUGH TO 15

Variable	Effect of Improvisation on Firm Performance by Moderating Condition		
	Model 1	Model 2	Model 3
Improvisation	0.306***	0.270***	0.286***
<i>Moderating Factor</i>			
Technological Turbulence		0.010	-0.024
Market Turbulence		0.205**	0.231**
Competitive Turbulence		-0.158**	-0.194**
Improvisation x Technological Turbulence			-0.157*
Improvisation x Market Turbulence			0.017
Improvisation x Competitive Turbulence			0.215**
<i>Summary statistics</i>			
R ²	0.094	0.134	0.179
Adjusted R ²	0.086	0.106	0.131
F	13.013	4.747	3.741
P	0.000	0.001	0.001

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 7-3 presents the results from the three regression models. Model 1 represents the relationship between organisational improvisation and firm performance; Model 2 indicates the relationship between organisational improvisation and the external environment factors (technological turbulence, market turbulence and competitive turbulence); and Model 3 represents the external environmental factors as a moderating effect on the relationship between organisational improvisation and firm performance. By looking at each model as a whole, all models (Model 1, 2 and 3) have significant correlations ($p < 0.01$), however when examined individually the results are mixed.

In Model 1, the first equation (Y_1) reveals that a total of 9.4% of the variance in firm performance is explained by organisational improvisation; with a significant F-value of 13.013 ($p < 0.001$). This result thus shows ***Hypothesis 12 is supported***. In Model 2, the result for the second equation (Y_2) the total variance explained by the model as a whole is 13.4%, ($F=4.747$; $p < 0.001$). However, only market turbulence and competitive turbulence show a significant relationship (as shown in Model 2 of Table 7-3; while technological turbulence becomes non-significant ($\beta=0.010$; $p > 0.1$). Lastly, in Model 3, the result for the third equation (Y_3) represents 17.9% of the total variance explained by the model ($F=3.741$). As can be seen in Model 3 (Table 7-3) the interaction of organisational improvisation and technological turbulence on firm performance is negative and significant, thus ***Hypothesis 13 is refuted***. It was also found that competitive turbulence has a positive effect on the relationship between organisational improvisation and firm performance, thus ***Hypothesis 15 is supported***. However, the effect of market turbulence on the linkage between organisational improvisation and firm performance is non-significant, thus ***Hypothesis 14 is not supported***.

The results presented in the hypotheses testing are summarised in Table 7-4.

TABLE 7-4: SUMMARY OF HYPOTHESES TESTING RESULT

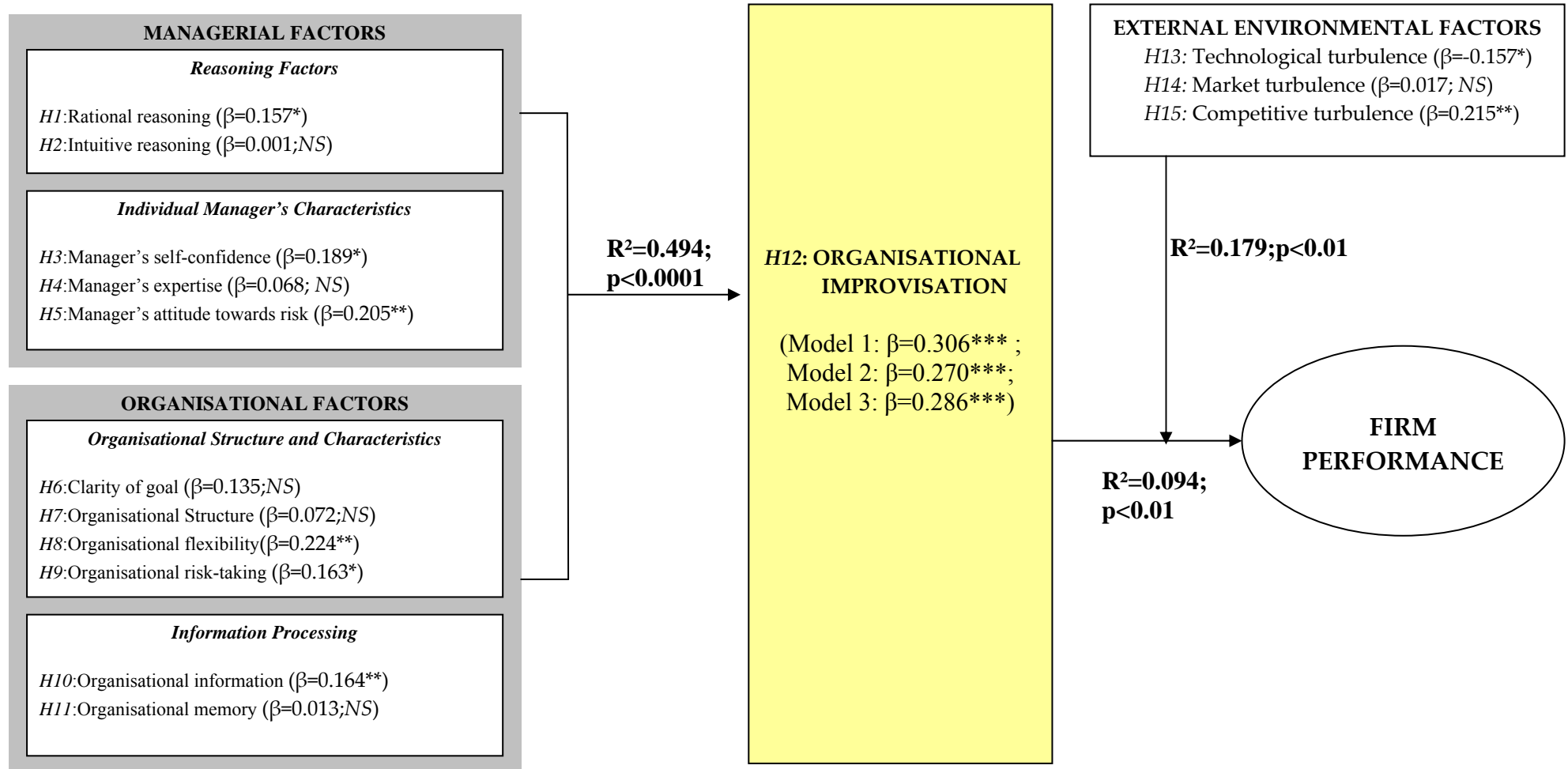
Hypothesis	Test of relationship	Result
Hypothesis 1	The greater the rational of reasoning, the lesser the organisational improvisation	refuted
Hypothesis 2	The greater the intuitive reasoning, the stronger the organisational improvisation	not supported
Hypothesis 3	The greater the manager's self-confidence, the stronger the organisational improvisation	supported
Hypothesis 4	The greater the manager's expertise, the stronger the organisational improvisation	not supported
Hypothesis 5	The greater the manager's attitude towards risk, the stronger the organisational improvisation	supported
Hypothesis 6	The greater the clarity of goal , the stronger the organisational improvisation	not supported
Hypothesis 7	The greater the organisational structure, the stronger the organisational improvisation	not supported
Hypothesis 8	The greater the organisational flexibility, the stronger the organisational improvisation	supported
Hypothesis 9	The greater the organisational risk-taking, the stronger the organisational improvisation	supported
Hypothesis 10	The greater the organisational real-time information, the stronger the organisational improvisation	supported
Hypothesis 11	The greater the organisational memory, the stronger the organisational improvisation	not supported
Hypothesis 12	The greater the organisational improvisation, the stronger the firm performance	supported
Hypothesis 13	The stronger the technological turbulence, the stronger the relationship between organisational improvisation and firm performance.	refuted
Hypothesis 14	The stronger the market turbulence, the stronger the relationship between organisational improvisation and firm performance.	not supported
Hypothesis 15	The stronger the competitive turbulence, the stronger the relationship between organisational improvisation and firm performance	supported

7.4. Concluding Remarks

To begin, this chapter discussed the descriptive analysis used to assess all summated data. Then, correlation analysis was employed to analyse the relationships between variables. The results showed that most variables were correlated; thus confirming the accuracy of the predicted hypotheses.

Next, this chapter proceeded into testing *hypotheses1* to *15* through standard and hierarchical regression analysis. The preliminary analyses through regression analysis confirmed that there was no violation on the assumptions of normality, linearity, multicollinearity and outliers in the hypothesis testing. The overall findings of the hypotheses in this study can be summarised in Figure 7-1. As can be seen in Figure 7-1, the total variance in organisational improvisation explained by all factors is 49.4%. These percentages confirm that the abovementioned factors substantially contribute to organisational improvisation, in particular managerial and organisational characteristics. The findings also demonstrate that the moderating factors do have a significant effect on the relationships between organisational improvisation and firm performance. The initial result showed that 9.4% of the total variance in firm performance was explained by organisational improvisation, but this increases to 17.9% when environmental turbulence factors are introduced as moderators. However, mixed (positive/ negative/ non-significant) results were identified when the association between each antecedent and improvisation and effect of each moderating factor was individually examined. Hence, the overall results are very much useful in facilitating thorough discussions for the next chapter, whereby the results will be compared with previous empirical studies.

FIGURE 7-1: THE SUMMARY OF OVERALL RESEARCH FINDINGS



Chapter 8

Discussion

8.1. Introduction

This chapter presents a discussion based on the interpretation of the multiple regression analysis results, which were presented in the preceding chapter, for each of the hypotheses examined. The discussion firstly considers the results presented for the relationship between reasoning factors and improvisation (*Hypothesis 1 and 2*), followed by managerial factors (*Hypotheses 3 through to 5*), the link between improvisation and organisational factors (*Hypotheses 6 through to 11*); the improvisation–performance link (*Hypothesis 12*); and the moderating effect of environmental turbulence on the improvisation–performance relationship (*Hypotheses 13 through to 15*). These discussions will focus on a comparison between the results of this study and previous research in the field.

8.1.1. Reasoning Factors

Extant strategy literatures focus on individual improvisation within the organisation with a particular emphasis on how top level managers deal with organisational improvisation when strategic planning and execution are simultaneous (*e.g.* Perry, 1991; Crossan *et al.*, 1996; Moorman and Miner, 1995; Kamoche and Cunha, 1998; Moorman and Miner, 1998b; Akgun *et al.*, 2005, Hmieleski and Corbett, 2006 and 2008). It is suggested that improvisational practices are dependent on routine or non-routine situations (Webb and Chevreau, 2006), level of time pressure and uncertainty (Crossan and Sorrenti, 1997; Crossan *et al.*, 2005), and the environmental stability or dynamism that

the company faces (Moorman and Miner, 1998b). In order to establish strategic fit with current environmental conditions, there is a necessity for top level managers to scan their business conditions and use reasoned (either intuitive or rational) judgment in the strategic decision-making process in order to conclude the best course of action for maintaining fit. From a review of the literature and to the author's best knowledge, there is an absence of empirical investigation that reveals the influential factors that affect organisational improvisation from a strategic management perspective; specifically, whether either intuitive or rational reasoning affects the tendency to improvise. Therefore, the relationship between the dual processes of reasoning (either intuitive or rational) and improvisation were hypothesised and tested in this study.

The study hypothesized that the reasoning process could have a significant effect on organisational improvisation. This gives the notion that the manager has to wisely reason on the choices of strategic decisions and make the 'right' decisions whether to go for improvisation or planning. *Hypothesis 1* asserted that the greater the rationality of the reasoning process, the lesser the execution of organisational improvisation, and *Hypothesis 2* proposed that the greater the intuitive reasoning process, the stronger the execution of organisational improvisation. Thus, managers tending towards rational judgements would not seek to improvise but rather, would adhere to formal planning processes. Meanwhile, those managers that are cognitively intuitive in nature would tend toward organisational improvising. According to the findings of the analysis, there is mixed support for these assertions. The results suggest a positive significant relationship between rational reasoning and organisational improvisation (refuting *Hypothesis 1*) whilst there is no relationship between intuitive reasoning and organisational improvisation (not supporting *Hypothesis 2*). These results contradict Leybourne and Sadler-

Smith's (2006) study in which they found that intuition has a direct link to *team* improvisation. However, a direct association between rational reasoning and improvisation is, to the author's best knowledge, the first empirical evidence on this relationship contributed to the improvisation literature.

Scholars believe that improvisation is intuition guiding action in a spontaneous way (Crossan and Sorrenti, 1997; Cunha *et al.*, 1999). Such a definition specifically implies improvisation to be risky and intuitive. However, the findings in this study imply that improvisation is not an accident or an outcome of recklessness but rather a rational and deliberate decision to undertake; suggesting that improvising is a deliberate choice taken by management, and possible then a strategic option in itself. This indicates that intuition is not actually the primary underpinning factor in improvisation as is often assumed, which in itself suggests an element of recklessness (Leaptrott, 2006); rather, these findings make the case that improvisation as a deliberate, information-based process undertaken by design and not by accident or for the sake of convenience based on pure intuition or 'gut-instinct'.

In addition, the presence of time pressures and uncertainty (Crossan and Sorrenti, 1997; Crossan *et al.* 2005) faced by the company could also create a different scenario of planning or improvisational activities. The organisation has several choices whether either (1) to continue with previous strategic plans by ignoring other external demands which signal the need to change plans; or (2) it can try to speed up its planning and execution processes with the intention that they can remain distinct; or (3) it can tend toward an improvisational approach where planning and execution processes emerge concurrently (Eisenhardt and Tabrizi, 1995). This relates to how managers make sense and reason toward the choices they have. The tendency for

managers to improvise is higher when they are faced with more turbulent environments (Hmieleski and Ensley, 2004). However, although the environment confronting most of the responding companies is highly dynamic (refer to mean for technological, market and competitive turbulence in Table 7-1, Section 7-2, Chapter 7), some conditions or activities may differ the outcome of the result. Different organisational stage or industrial stage (*e.g.* introductory stage, growth stage, maturity stage or declining stage); or routine or non-routine activities within the organisation may affect how the managers make sense of their circumstances and reason toward improvisation. For instance, the biotechnology industry is suggested to be highly dynamic with a high level of uncertainty. But in the context of the Malaysian biotechnology industry, this industry can be considered in its infancy stage. Due to government pressure for high quality biotechnology products, the activities of this industry are mostly monitored under the Ministry of Science, Technology and Innovation, Malaysia. With the help of certain projects from this Ministry, the level of environmental uncertainty is limited relative to western environments such as in the USA and so may not be such a huge threat for the industry. The level of competitive intensity, for example, is not as high as the companies which face global competition in their business operations, where most of them are more exposed to a high level of turbulence (Ottesen and Grønhaug, 2004). In this case, the top managers in this study could then be more rational in their reasoning processes when implementing improvisational activities, rather than promoting intuitive reasoning in their decision-making. As such, the cultural and operational conditions managers face in Malaysia may allow them to focus more on rational reasoning than having to rely on intuition to combat extreme turbulence.

Studies by Truman (1996) and Aram and Walochik (1996), both conclude that there are relationships between intuitive decision-making and improvisation. However, in both instances the research studies are case study-based and therefore it is difficult to generalise to the whole population, a weakness of case study design. Aram and Walochik (1996), also using case study analysis, state that Spanish managers who often implement improvisation prefer to carry out informal and spontaneous decision-making. Similarly, Burke and Miller (1999) found that 90% of managers used intuitive decision-making in complex business scenarios. Nevertheless, these research findings only suggest that a positive relationship occurs between intuitive decision-making and improvisation, but, not managers' intuitive reasoning system. That is to say, the reasoning system could be distinguished from decision making process. According to Evans *et al.*, (1993), reasoning tasks specifically in deductive reasoning can be viewed as *"a special case of well-defined problem solving tasks, whose main purpose is to investigate people's ability to understand and apply logical principal; whereas decision making tasks involve choices between action and normally involve commitment to particular acts at one point in time, whose consequences would later be apparent"* (p.166). Hence, it is important for future research to investigate the differentiation between these processes because the reasoning process is used to support decision-making for the achievement of goals (Evans *et al.*, 1993; Evans and Over, 1996).

Leaptrott (2006) stated that the rational system of reasoning tends to be more deliberate and is more likely to involve a reasonable amount of information generation and analysis of alternative courses of action. The results support the assertion that information processing has a direct positive link with organisational improvisation (*see the result of Hypothesis 10*). Therefore, with sufficient information throughout the organisation, managers may go for a rational system of reasoning rather than follow their

'gut' when executing improvisational activities. In fact, this condition is reliant on the degree of information, uncertainty and time availability during their improvisational activities (Crossan *et al.*, 2005) unlike some institutions, where the uncertainty and time pressure is extremely high (*e.g.* fire fighters, emergency response unit), emphasising speed of decision-making and need for immediate solutions; in which case, managers may well apply intuitive reasoning judgment to respond and act quickly.

The adaptation and influence of corporate and national culture, which reflect the way managers think and work, may also be a factor in explaining why results vary between past and current research (*e.g.* Chelminski, 2007). According to Chelminski (2007), corporate and national culture may influence facilitating factors for organisational improvisation, for example, *"Corporate culture will have a tremendous influence on the propensity to improvise through the way people in the organisations share values, engage in information exchange process, and the level of trust and commitment among organisational members"* (Chelminski, 2007: 116). Meanwhile, national culture is embedded within the values and beliefs that are learnt and shared among groups, regions and the nation (Chelminski, 2007). As such, in the case of Malaysia, a society accepts an unequal distribution of power or a high power distance (Hofstede; 1984). This culture is then reflected upon the organisational culture. For example, with high power distance culture, firms tend to practice a close door meetings whereby only top management teams and some selected employees are participants. Due to this finding, organisational culture might be an antecedent of organisational improvisation and it thus demonstrates a significant for future research.

This study used high technology companies from Malaysia as sample respondents. With different sample respondents, different contexts, sectors,

industries and countries, variations in culture may be a key reason why the results differ from previous research (*see* the study by Leaptrott, 2006, and Leybourne and Sadler-Smith, 2006, for the relationship between intuitive reasoning and improvisation). This then, one would assume, is deserving of further research attention.

8.1.2. Individual Managerial Factors

Individual managerial factors, in this study, refer to the characteristics of individual top executive managers of the firm. Manager's self-confidence, level of expertise and attitude towards risk were the three individual characteristics that were hypothesised to affect organisational improvisation. *Hypothesis 3, 4 and 5* individually stated that manager's self-confidence, expertise and attitude towards risk would be positively related to organisational improvisation.

Intriguingly, different results were found when these individual characteristics were tested against organisational improvisation. *Hypothesis 3* (level of self-confidence) and *5* (managerial attitude towards risk) were found to have a significant positive affect on organisational improvisation, while a contrasting result was found for managerial expertise in which no significant relationship was found (hence, *Hypothesis 4* was not supported). The fact that managerial expertise does not have a positive direct relationship with organisational improvisation contradicts the findings presented in extant literature, such as Crossan and Sorrenti (1997), Cunha *et al.* (2002), Vera and Crossan (2005), and Leybourne and Sadler-Smith (2006). Cunha *et al.* (2002), for example, suggest that skilled managers normally apply their expertise on a real-time basis where there is less reliance on formalised planning and a greater tendency to improvise (Gibbon *et al.*, 2005). In strategic management, the real-time basis could be in the condition of improvisational processes

where the process of strategic formulation and implementation emerge simultaneously. However, the degree and type of expertise may differ in various settings, which could have a differential impact on improvisation (Whittington, 1996; Leybourne and Sadler-Smith, 2006). It may well be that Malaysian managers are not inclined to rely on past experiences in making present day judgements and decisions and if so, this would have interesting implications for the management literature. For instance, western managers are often assumed to rely on past experience in strategic decision-making and often results in actions that maintain the strategic status quo (*e.g.* Hambrick *et al.*, 1993; Geletkanycz and Black, 2001). There may well be some cultural issues at play here too that mitigate the tendency of managers to rely on past experiences (*c.f.* Geletkanycz, 1997). Overall, expertise is not concluded here in this study to be relevant to driving organisational improvisation and there would appear to be clear explanations for this in the management literature despite these findings contradicting the improvisation literature.

In this study, the individual managerial factors only affect organisational improvisation when managers are confident and risk oriented. To elaborate further on this issue of expertise: having abundant expertise does not drive the manager to improvise, particularly when the manager is not a risk taker and does not possess a high level of confidence. There are a number of possible explanations for this finding in relation to expertise. Firstly, different managers' skills and degree of expertise could hinder creativity and innovative elements that enable the implementation of improvisational activities within organisations (Whittington, 1996). Some managers who have the necessary expertise are used to working in a pre-planned environment (Whittington, 1996) in which implementing improvisation is less favourable due to the potential costs incurred. Hence, some organisations may discourage managers from being oriented towards improvisation because the

costs involved are too high to bear. Secondly, there may be a tendency for expert managers to use business practices that they feel comfortable with and resist change to new business approaches (e.g. improvisational process) that may be more affective for organisational performance, since those who have power have a vested interest in the status quo and may resist change because it can threaten their power (Nadler, 1981).

Referring to *Hypothesis 3*, the findings demonstrated that the higher the self-confidence level of the manager, the more likely organisational improvisation will occur. This result is the first in empirical research that has disclosed the nature of this relationship; therefore it leads to the contribution for not only theory development but also implications for practitioners. For instance, the level of self-confidence has a positive impact on the manager's ability and willingness to improvise. This means that improvisation requires confidence in one's ability to perform in a 'pressure cooker' environment (Kanter, 2002). This is consistent with Leybourne and Sadler-Smith (2006) who state that to some extent confident managers may well influence improvisation. However, their study suggests that an element of intuition is often accompanied by a 'confidence' in their rightness and 'wrongness' which directly relates to the actions of the manager. In this study, the link between intuition and improvisation appear to be non-significant (see *Hypothesis 2* result). Despite this, it is still significant to carry out further research to better understand the relationship between intuition, self-confidence and improvisation; as well as the identification of other elements that could affect the link between confidence and improvisation, such as an individual manager's level of distress (Kanter, 2002).

Comparable to the manager's self-confidence level, their attitude towards risk also affects improvisation (supporting *Hypothesis 5*). The finding

shows that if a manager is risk oriented, then their tendency to pursue improvisation is substantial. Chelminski (2007) proposes that attitude towards risk is one of the most important conditions for organisational improvisation, since improvisation goes toe-to-toe with uncertain circumstances, there will always be a degree of risk at stake. In business, juggling with improvisation is not an easy option when the risks involved are sometimes unbearable (Baird and Thomas, 1985; Barret, 1998). Therefore, a positive attitude towards risk drives managers to improvise (Chelminski, 2007). Besides this, top level business executives could be considered as professional risk takers because they always deal with risk when designing solutions and making decisions (MacCrimmon and Wehrong, 1990). It just depends on the manager to what extent that they are willing to go further in both risk-taking (Baird and Thomas, 1985) and in implementing improvisation. Even in a more conducive and pro-improvisation environment, it is still to the discretion of the manager as to whether they are risk averse or risk oriented. The personal character of the manager (Gilley *et al.* 2002) and organisational policy on risk management, then, can be considered as factors that influence organisational improvisation (more on this later in relation to *Hypothesis 9*). In sum, the more willing the manager is to take risks, the more likely the organisation is to improvise and enable improvisation to occur. With regards to this analysis sample of this study, it implies that most top managers from Malaysia technology-based companies are risk takers; and by owning this attitude, it could thus drive them to improvise in their strategic business processes.

8.1.3. Organisational Factors

Organisational factors are the collection of characteristics from individual group members within the company. There are two aspects of organisational factors examined in this thesis, one relates to organisational characteristics, and the second focuses on information processing. There are

four factors that have been tested to examine the effect of 'organisational characteristics' on organisational improvisation, these are: goal clarity (*Hypothesis 6*), minimal structure (*Hypothesis 7*), organisational flexibility (*Hypothesis 8*) and organisational risk-taking (*Hypothesis 9*). 'Information processing', on the other hand, focuses on organisational real-time information (*Hypothesis 10*) and organisational memory (*Hypothesis 11*).

Overall, the results of *Hypotheses 6* through to *9* reveal a significant relationship between organisational characteristics and improvisation. This finding suggests that the management of the firm needs to consider possible organisational characteristics which contribute to creating a climate of improvisation in the strategic management process. However, when organisational factors are examined closely, only two relationships demonstrate a significant positive influence on organisational improvisation: flexibility and organisational risk-taking (*Hypothesis 8* and *9*). Organisational goal clarity (*Hypothesis 6*) and minimal structure (*Hypothesis 7*), on the other hand, do not show a significant effect on organisational improvisation. Whilst this would appear, on the face of it, to run against conventional thinking in the literature it would however suggest the need to research in greater depth the various organisational and structural conditions that drive improvisation.

Clarity of the organisation's goals is often deemed crucial for business success. It provides a clearly defined strategic direction (MacKenzie *et al.*, 1998) and a fundamental aim and guideline for the team's efforts (Millson *et al.*, 1992; Kessler and Chakrabarti, 1996; McDonough III, 2000; Hong *et al.*, 2004). Scholars suggest that clarity of goals is imperative and significant for increasing decision speed (Murmman, 1994; Cooper *et al.*, 1998). With clear goals, the manager and employees can easily speed up decision-making (as the target goal is clear) and indeed the strategy process, especially when it

comes to making a creative, spontaneous and concurrent process of strategy formulation and implementation (improvisation). Therefore, this research study proposed a positive significant relationship between clarity of goals and organisational improvisation. The result show, however, that organisational goal clarity does not have any significant relationship with organisational improvisation. This suggests that clarity of organisational goals does not have any effect on concurrent processes of strategy formulation and implementation (in terms of improvisational processes) in strategic decision-making. Hence, this result does not support the proposed relationship between goal clarity and improvisation (*e.g.* Akgun and Lynn, 2002).

The results suggest that goal clarity does not drive a manager either way toward planning or improvisation (in the context of this study). As such, the assumed benefits for decision speed, and potentially improvisation, are not realised. This would suggest that other organisational forces are at play that bears a stronger influence on the tendency to improvise. Whilst goal clarity does provide knowledge on a clear strategic direction for the firm, this does not seem to translate beyond this into additional benefits such as improvisation. This does not mean to say that goal clarity is unimportant, as having a clear defined set of goals clearly is, but rather that in this study there is no discernable benefit that arises from it in terms of improvising.

The same insignificant relationship appears to be the case for the minimal structure—improvisation relationship since there is no direct association. This provides alternate evidence to that presented in extant literature (Kamoche and Cunha, 2001; Gibbons *et al.*, 2005; Cunha and Cunha, 2006a and 2006b; Webb and Chevreau, 2006; Souchon and Hughes, 2007; Ford, 2008), which claims that organisational structure should speed-up (in minimal/ decentralised/ organic structures) or delay (in centralised/

mechanistic structures) improvisational activities. This is intriguing as normative assumptions would indicate that decentralisation frees up authority for employees to pursue actions and take decisions around their work, which clearly could create a climate for improvisation to occur. This is not the case here and suggests a need to rethink normative improvisation assumptions. It is essentially important to investigate again this relationship because the 'structure' is one of the essential elements of strategy as a process. In future studies, the measures and the right sample respondents need to be clearly identified to representing the organisations that are more inclined towards practicing organic/minimal structure. This study reveals the mean value of 3.5951 for organisational structure (please refer to Section 7.2, Table 7-1). It implies that many respondents in this study applied a mechanistic structure but at the same time implementing improvisational processes in their business operations. The conditions of the association between structure and improvisation contradict past research. Previous research (*e.g.* Slevin and Covin, 1997; Weick, 1998; Barret, 1999; Cunha *et al.*, 1999; Kamoche *et al.*, 2003; Cunha and Cunha, 2006a and 2006b) relates that mechanistic structure is more prevalent in firms with formalised planning processes whereas organic/minimal structure tends to appear in improvisation-oriented firms. Therefore, further research needs to consider the type of organisational structure (either mechanistic or minimal/organic) in order to examine further the conditions for organisational improvisation.

Both set of results imply that managers do not think of the importance of clarification of goal and the type of organisational structure (whether either mechanistic or organic; or centralised or decentralised) when they want to improvise. To elaborate, the managers may ignore the element of goal clarity and organisational structure when they are faced with a turbulent environment because there is a need to cope with time pressures and actions

in an unplanned way in order to drive the organisation to improvise (Vera and Crossan, 2005; Chelminski, 2007) and of course, successfully deal with the environmental conditions at hand. The managers will creatively use the things around them or from available resources (bricolage) to form solutions and improvise (Crossan and Sorrenti, 1997; Moorman and Miner, 1998b; Cunha *et al.* 2002) so as to ensure the strategy unfolds as intended (Crossan and Sorrenti, 2002). Thus, faced with competing strategic considerations, goal clarity and decentralising as a means to elevate improvisation become secondary or tertiary considerations to the need to deal with current competitive conditions and execute strategy. Indeed, perhaps an element of needing to retain control is pervading managerial thinking in this regard as possible decentralisation would destabilise control mechanisms and as such destabilise strategic management in the sampled companies. On that basis, whether or not a specific form of structure is used may well be contingent upon the circumstances affecting the company. Therefore, structure itself may only affect the tendency to improvise under certain specific environmental conditions. In stable times, minimalist structures may well allow for improvisation to occur. Meanwhile, in uncertain conditions, then need to maintain control may well lead to more formal structures. Improvisation may then be an outcome of managerial discretion (Finjelstein and Hambrick, 1990) rather than structure. Managerial discretion refers to the leeway for action available to top managers and is a means of accounting for differing levels of constraint facing top managers (Finkelstein and Hambrick, 1990). Where managerial discretion is low, environmental turbulence is assumed to be high and the role of the top managers is limited in influencing outcomes and as such may demand retention of control so that strategic fit can be maintained. Where discretion is high, managers can significantly shape the organisation, its structure and behaviour and allow for greater discretion in the activities of

the organisation, such as greater improvisation. Examining managerial discretion further could represent a useful avenue for future research.

On the basis of the findings presented, it is believed that other elements such as flexibility, organisational risk-taking and real time information within the organisation are more important for the improvisational process. The results of *Hypothesis 8* and *9* reveal that organisational flexibility as well as the tendency for organisational risk-taking has a significant positive association with improvisation. The results thus support the research of Scribner (1984) and Akgun *et al.* (2006), for the link between flexibility and organisational improvisation, as well as the conceptual study by Chelminski (2007) on the positive significant relationship likely between organisational risk-taking and improvisation. This study is, to the author's best knowledge, the first empirical study to examine organisational flexibility and organisational risk-taking as independent variables that directly effect organisational improvisation from a strategic management perspective. In this case, it indicates that the flexibility of an organisation is positively associated with the improvisational activities of the organisation. This result also suggests that those organisations which actively seek to take risks will contribute to the conditions required for strategic improvisation.

The result on organisational flexibility indicates the need for organisations to have a capability in rapidly responding to various demands and opportunities especially when dealing with improvisational activities (Scribner, 1984; Akgun *et al.*, 2006). This condition is crucial for improvisation. With flexibility, an organisation would be able to creatively and spontaneously commit resources to new courses of actions in response to those changes (Shimizu and Hitt, 2004). Having organisational flexibility also enables the organisation to recognise and act promptly when it is time to

reverse or abandon existing resource commitments (Shimizu and Hitt, 2004). This condition subsequently accelerates improvisational activities within organisations, specifically in the context of Malaysian high technology-based companies.

Another contribution of this study concerns the relationship between risk-taking behaviour and improvisation. The positive significant link between these concepts demonstrates that organisational risk-taking, which involves resource investment in activities with uncertain outcomes, can have a positive effect on organisational improvisation. The finding of this relationship reveal that organisations (in this case Malaysian high technology companies) which invested in risky behaviour such as R&D, innovation, high debt financing and so forth can drive the condition for organisational improvisation. This signifies that risk-taking is a crucial element at the organisational level and therefore it appears as a necessity for organisational risks to be allowed and tolerated for improvisation to arise. It would appear beneficial for improvisation then for managers to be predisposed toward risk-taking and allow for the organisation itself to pursue risks. Incompatibilities between managerial attitude toward risk and organisational risk-taking would surely then dampen the likelihood that improvisation would occur. For instance, risk-averse managers are unlikely to want to allow their organisation as a whole to become too risk laden and as such this would reduce the likelihood that improvisation occurs.

With regards to *Hypothesis 10* and *11*, collectively, the findings reveal a significant association between information processing and improvisation. This suggests that the greater the access to information that the manager has, the greater the organisational improvisation. The result demonstrates support and insight from a new context into the management–improvisation

perspectives of extant literatures (Moorman and Miner, 1998b; Weick, 1998; Cunha *et al.*, 1999; Akgun and Lynn, 2002; Crossan, 2005; Vera and Crossan, 2005; Leybourne, 2006) which suggest that these two factors contribute to the required conditions for improvisation. Nevertheless, when organisational information and organisational memory are examined separately, the results display mixed results. Organisational information is shown to have a positive significant association with improvisation (supporting *Hypothesis 10*), but not when the relationship between organisational memory and improvisation is considered, a non-significant relationship is found (not supporting *Hypothesis 11*).

In this study, the relationship between organisational information and improvisation has confirmed and supported the research of Cunha *et al.* (1999), McKnight and Bontis (2002); Crossan *et al.*, (2005), Vera and Crossan (2005), and Leybourne (2006), that is, when managers have realtime information in hand, they will courageously improvise their business process to be suited to the intended strategy. This finding is reflected by Weick's (1998) study of the survival of a fire fighter, who had to improvise to save his life from the fire by using the information that he's learnt before the incident. When applied to the business context, this scenario illustrates that real time information within the organisation is imperative in order to achieve creative and spontaneous actions during the concurrent process of strategy formulation and implementation.

Besides this, in the business world, the collective information from all levels (operational level, middle line and top executive level) is critical to effective improvisation to achieve the desired strategy (Moorman and Miner, 1998b) as well as to enhance organisational capabilities and performance. For example, an organisation could counter the strategies of competitors through

effective use of information about new customer preferences, customer demand, the weaknesses of their rivals, or technology innovation, all of which could strengthen the organisation's product and/or service offerings (David, 2001; Thompson *et al.*, 2004; Hitt *et al.*, 2006) as well as improvisational activities. Ultimately, by having access to information on a real-time basis, the ability to improvise is increased as managers have greater confidence in the likelihood that taking such actions would succeed. Taking actions in the absence of information is risk laden but also foolhardy and rash. Thus, a distinction arises between risk-taking and actions based on no or very little information. Information processing supports improvisation as it allows for controlled risk-taking (to a point) and provides greater confidence that the actions taken are correct and accurate (based on the information available). Where actions are taken without real-time information, then the organisation is tending toward improvisational actions that may cause more harm than good and as such would be irrational.

Hypothesis 11 presents the final organisational factor to be considered: the relationship between procedural memory and improvisation. Procedural memory refers to a non-declarative memory system which commits with long-term memory of skills and procedure and is learned over time through practice (Cohen and Bacdayan, 1994). It can also be defined in the same bracket as the "how to" knowledge or procedural knowledge. From a management perspective, memory allows managers to absorb new knowledge and information, store it in their mind (in the case of organisation, it stores in databases or files) and subsequently use it for organisational improvisation.

The finding of this relationship demonstrates that there is no significant link between organisational procedural memory and improvisation. This

finding is not supportive of previous empirical research on the association between memory and improvisation. Previous research, for instance, suggests that there is a positive link between memory and expert improvisation (Souchon and Hughes, 2007) and a negative significant association between memory and improvisation as found in the work of Moorman and Miner (1998b and Akgun and Lynn (2002). These two studies reveal a negative significant association between memory and improvisation, thus signifying that the higher the procedural memory, the less the improvisation. Therefore, if organisations rely more on procedural memory, then it will be unlikely to embrace improvisation. The findings by Moorman and Miner (1998b) and Akgun and Lynn (2002) are supported by the work of Webb and Chevreau (2006) who state that organisational reliance on rules and procedures minimize the implementation of improvisation, since organisational members will lose the ability to think creatively and handle new or uncertain situations (Webb and Chevreau, 2006).

The established relationship between the two constructs is logical given that improvisation involves making unplanned decisions and forming real-time actions, altering pre-planned activities and involving substantial creativity; while procedural memory, on the other hand, is about doing things according to a pattern or implicit procedure to do things. In conditions where the organisation is faced with environmental uncertainty and time pressures, the organisation can be assumed to use real-time information, instead of archiving 'stored memory', in order to respond quickly through improvisational activities. Therefore, it can be concluded that organisational procedural memory may not facilitate organisational improvisation. It may well be that managers realise that real-time information is superior for taking improvised actions rather than relying on past actions and behaviours from

memory to tackle current issues. Whether this holds true for managers in different countries and cultures remains open to speculation however.

8.1.4. Organisational Improvisation-Performance Relationship

In strategic management studies, previous research have investigated and linked variables such as strategic planning and strategy making processes (Rogers *et al.*, 1999; Brews and Hunt, 1999; Slotegraaf *et al.*, 2004), business-level or corporate-level strategy (Porter, 1980; Miller, 1988; Liao, 2005), organisational structure and capabilities (Burns & Stalker, 1961; Miller, 1988; O'Regan and Ghobadian, 2004) and choice of environmental domains (Bourgeois, 1985; Miller, 1992; Garg *et al.*, 2003) to various performance measures. To date, the study on the direct association between organisational improvisation and organisational performance as a whole is still limited and yet again, to the author's best knowledge, this study is the first empirical research that reveals the nature of this relationship from a strategic management perspective. This result of *Hypothesis 12* show that there is a direct positive link between these factors; thus refuting the suggestion by Crossan *et al.* (2005) and Hmieleski and Corbett (2006) that improvisation and performance must be moderated by other variables, in order for a significant association to be present between these variables.

Explicitly, the finding of the direct association between improvisation and firm performance is the first study to contribute knowledge in this regard and provides interesting implications for strategic management theory as well as implications for practitioners. This result can help organisations to redefine their business process by considering improvising processes that leads to superior performance. In the case of Malaysia high technology-based companies, the potential achievement of firm profitability, competitive advantage and market standing are an effect of good implementation of

improvisational process within organisation. Due to the nature of the companies, they are faced with turbulent environments and these high technology companies need to remain competitive and execute improvisational activities within their organisations in order to sustain and enhance their business performance. From a theory perspective, strategic management theory can evolve beyond the usual consideration of step-by-step strategy formation as a means to superior performance and advantage and realise that that performance can be enhanced through improvising away from plans and strategies. Improvisation provides a clear means for maintaining strategic fit and benefits performance through this. These findings enrich the works of Mintzberg in relation to intended and emergent strategy approaches, and demonstrate clear viability in performance terms, for an improvisational approach to be adopted by organisations.

8.1.5. External Factors as Moderating Variables

The final sub section of this study is related to *Hypothesis 13, 14 and 15*. These hypotheses investigate whether environmental turbulence has a positive moderating effect on the improvisation–performance relationship. The study is considered as the first empirical study to test the moderating effect of environmental turbulence on the link between improvisation and firm performance, since previous research has focused on new product development as their primary dependent variable (*e.g.* Moorman and Miner, 1998b; Akgun and Lynn, 2002; Crossan *et al.*, 2005, Vera and Crossan, 2005; Leybourne and Sadler-Smith, 2006).

Collectively, the result of this study indicates that environmental turbulence has a significant moderating effect on the improvisation–performance relationship. This result, however, differs for each element of environmental turbulence, but nonetheless implies that organisations may not

be able to follow the usual planning processes of analyzing the market to identify opportunities and then taking the time to develop new products and strategic options to capitalise on such opportunities. Once the environment wherein an organisation operates experiences a large number of changes and highly turbulent competitive conditions, organisations, such as high technology-based companies in Malaysia, should then be encouraged to consider implementing improvisation in order to address these conditions and enhance its firm performance. Organisations need to be more committed and creative under turbulent conditions, even if it means sacrificing some of its existing resources in order to implement improvisation and be more competitive. In this case, the improvisational approach can give organisations the necessary edge and ability to identify significant linkages that better meet the emerging customer needs, technologies, and competitive situation (Zahra, 1997; Ottesen and Grønhaug, 2004; Akgun *et al*, 2007) and consequently increase firm performance.

Examining the three forms of turbulence individually, only two of the three predicted moderators (technological and competitive turbulence) show a significant moderating affect on the improvisation–performance relationship. These findings contradict previous research in this area. Moorman and Miner (1998b), for example, propose that market turbulence is a positive predictor of the level of organisational improvisation, while Akgun and Lynn (2002) suggest that for turbulent markets, improvisation is positively associated with speed-to-market. Market turbulence concerns primarily the rate of changes in customer needs and preferences (Jaworski and Kohli, 1993; Moorman and Miner, 1998b; Thompson and Strickland, 2004). In this study, market turbulence has been shown to have a non-significant moderating effect on the improvisation–performance relationship. This result (*Hypothesis 14*) exemplifies that the greater or the lesser changes in customers

needs and preferences does not effect the significant relationship between improvisation and firm performance of high technology-based companies in Malaysia.

Technological turbulence, on the other hand, has shown a negative moderating effect between improvisation–performance relationships (thus refuting *Hypothesis 13*). This result suggests that when an organisation is faced with technological turbulence, managers may need to improvise less in the way that they conduct their activities in order to cope with technological turbulence as improvisation has negative performance connotations under conditions of high technological turbulence. Or put another way, the more turbulent the technological environment, the stronger the negative relationship between improvisation and performance. This result supports Moorman and Miner’s (1998b) study, which revealed that the improvisation—cost efficiency relationship become weaker and more negative when technological turbulence is high. According to Jaworski and Kohli (1993), technological turbulence is the changing pace of product and process technologies used to transform inputs into outputs. Improvisation of product and process technologies requires high investment by the company and can consequently diminishes firm performance. One example to represent this scenario is Kodak Corp, a company synonymous with film. However, with the increasing popularity of digital cameras, the company improvised its product line by producing its own digital camera. Due to the time pressure and in coping with technological turbulence, sales turnover diminished (Ketchen *et al.*, 2007). This scenario bears resemblance to the situation of high technology-based firms in Malaysia. Most Malaysia high technology-based companies require high investment (*e.g.* to buy new sophisticated equipment or machines) to dynamically cope with the technological turbulence. In the short run, potential consequences of these new technological changes such as

the employees change resistance, employees' learning period and so forth could be harm to firm performance and potential degradation to competitive advantages over time.

With regards to the relationship between improvisation, competitive turbulence and firm performance, this study contributes new knowledge to the improvisation and strategic management literatures. Competitive turbulence is defined in this study as the rate at which other firms modify their competitive methods, including the development and introduction of innovations (Kohli and Jaworski, 1990; Thompson and Strickland, 2004). In examining competitive turbulence as a moderator of the improvisation–performance relationship, the findings (*Hypothesis 15*) provide empirical evidence that this moderating effect is significant and positive, thereby supporting extant literatures, which suggest that the increased speed of competition might enable organisations to develop an improvisational competency (Mintzberg and McHugh, 1985; Brown and Eisenhardt, 1995; Eisenhardt and Tabrizi, 1995; Cunha *et al.*, 2003; and, Cunha and Cunha, 2006b), that is, the organisations often respond to such situations by improvising rather than responding through plans (Moorman and Miner, 1998b) and over time this can lead to the development of a competence in improvising, which in itself may become a form of competitive advantage. Whilst harsh competitive conditions are often seen as a bad situation to be in, higher levels of performance can be realised through addressing the environmental conditions through organisational improvisation.

Under competitive turbulence, competitors commonly move in and out of markets to rapidly shift their strategies (Kohli and Jaworski, 1990; 1993; Narver and Slater, 1990; Greenley, 1995). The organisation is then required to strengthen its position within the industry by using strategies to rival those of

its competitors. In the case of high technology-based companies in Malaysia, this implies that improvisation is a key factor to increase their firm performance and supports the studies by Moorman and Miner (1998b), Akgun and Lynn (2002) and Vera and Crossan (2005). More specifically when the organisations face highly competitive environments then improvisation becomes even more important for performance, and thus supports the contentions of Cunha and Cunha (2006b).

It can also be expanded upon here that environment conditions must play a role in determining whether or not the firm should seek to improvise. As indicated earlier, in case of low or high market turbulence the decision to improvise does not have much bearing on performance. However, when technological turbulence exists it is preferable to improvise only when conditions are relatively benign as otherwise improvisation harms performance. This is likely related to the need to properly assess and exploit technological changes and innovations in a planned manner such that the firm is making optimum use of the situation or making the optimum response to the situation. Improvising itself can be costly depending on the actions taken and taking such risky actions in addressing technological changes would appear suboptimal. Finally, in relation to competitive circumstances, it is clear that improvisation has greater performance benefits under turbulent conditions and once again, we should question whether improvisation is of much value in benign competitive conditions. Managers must then proceed with caution when improvising in the light of specific environmental conditions.

8.2. Concluding Remarks

This chapter has discussed the findings of the study in light of extant literatures. Specifically, the results from seven hypotheses extend and support

extant literature. These hypotheses are *Hypothesis 3* (the link between manager's self-confidence and improvisation), *Hypothesis 5* (the link between manager's attitude towards risk and improvisation), *Hypothesis 8* (the association between organisational flexibility and improvisation), *Hypothesis 9* (the relationship between organisational risk-taking and improvisation), *Hypothesis 10* (the link between organisational information and improvisation), *Hypothesis 12* (improvisation-performance relationship), and *Hypothesis 15* (competitive turbulence as moderating effect on improvisation-performance relationships). Further, this study also revealed that two hypotheses were refuted, suggesting alternate relationships to that proposed in the extant literature. These hypotheses are *Hypothesis 1* (rational reasoning which demonstrates a positive association on improvisation) and *Hypothesis 13* (technological turbulence which demonstrates a negative significant moderating effect on the improvisation-performance relationship). *Hypothesis 2*, *Hypothesis 4*, *Hypothesis 6*, *Hypothesis 7*, *Hypothesis 11*, and *Hypothesis 14* were not supported despite the theoretical support for these relationships in extant literatures. Though, the author recognises that context, culture, sectors and environment may distinguish the results from previous, current and future studies (Moorman and Miner, 1998b; Akgun and Lynn, 2002; Vera and Crossan, 2005; Chelminski, 2007). Therefore, one would assume, these are deserving of further research attention.

The findings highlight a number of contributions made by this study to both theory development and practitioners. The contributions and implications of the study findings are now discussed in depth in Chapter 9. Avenues for future research are also highlighted and discussed in light of the limitations of this study.

Chapter 9

Conclusions

9.1. Introduction

This chapter starts with a summary of the whole thesis and reflections on the overall research process. It is then followed by discussing the potential implications of the findings to both theoretical and managerial practices. The limitations of this study and directions for future research are then discussed at the end of this chapter.

9.2. Thesis Summary

This section provides the summary of the thesis as a whole. It starts with a discussion of the research objective and research questions as well as the significance of this study. The following sub-section provides an overview of the research framework, research design, research analysis and lastly the findings of the research.

9.2.1. Research Objectives and Research Questions

The first chapter in this thesis introduces the background of the study which arrives at the research objective. The main research objective of this study is to examine the antecedent factors affect organisational improvisation from a strategic management perspective and to identify how improvisation determines firm performance. This research objective resulted in the formulation of a number of specific research questions, which are as follows:

1. What antecedent factors are involved at the managerial level as the conditions for organisational improvisation?
2. What antecedent factors are involved at the organisational level to give rise to improvisational behaviour?
3. What is the relationship between organisational improvisation and firm performance?
4. What are the contingent elements that moderate the relationship between improvisation and firm performance?

In order to answer the above research questions, extant literatures have been reviewed in order to develop a conceptual model (*see* Chapter 2) and to construct hypotheses on organisational improvisation and performance, from a strategic management perspective (*see* Chapter 3). This study is exploratory-based and aimed to identify the empirical evidence based on extant theories. This development of conceptual model has been tested using a survey design method. From this, a questionnaire was distributed to obtain primary data from top management executives of high technology-based companies.

9.2.2. Significance of the Study

The findings of this study are of great significance to academic researchers as well as practitioners in the business arena. The research model of this study sought to provide the importance of improvisation to firm performance from a strategic management perspective. Previous empirical research on organisational improvisation in strategic management is limited. Since the improvisational process has been introduced in the strategic management literature, typical understandings of the strategic management process can be contended. Most scholars suggest that managers have to undergo strategy formation phase by phase in the process of strategic management; such as strategic planning, followed by strategic

implementation and then strategic evaluation (David, 2001; Thompson and Strickland, 2004; Hitt *et al.*, 2005). However, in real business, the process between strategy formulation and execution could be done simultaneously (Mintzberg and Waters, 1985) to stimulate actions and gain the best or optimum solutions; especially when actions must be taken during non-routine situations or in a rapid manner. Most managers generate real-time action as it unfolds (Moorman and Miner, 1998b; Cunha and Cunha, 2002, Vera and Crossan, 2005). This study has therefore examined the significance of organisational improvisation for firm performance, from a strategic management perspective. Further, the investigation of the association between improvisation and firm performance at the organisational level is considered as something new in improvisational and management literature, thus this context is prominently beneficial to be contributed to knowledge and practices in these areas.

A key contribution of this study is that the findings can contribute to new knowledge and practices, offering new evidence of the possible factors affecting organisational improvisation. This study is the first to examine the foundations (antecedent factors) of organisational improvisation that are rooted from 'strategy process' theory. These antecedent factors are classified onto managerial and organisational factors that drive improvisation. The managerial factors consist of the rational of reasoning, self confidence and manager's attitude towards risk; and the organisational factors comprise of the organisational flexibility, risk-taking and real time information were significantly associated with organisational improvisation. The external contingent factors including technology and competitive turbulence which act as a moderator to improvisation-performance link were also disclosed to examine on how improvisation can help to stimulate better firm performance. The implications and contributions to knowledge and practices from the

context of this study will be discussed thoroughly in the next section (refer to Section 9.4).

Lastly, this study is also expected to contribute significantly to the high technology industry in Malaysia particularly in terms of empirical verification on how improvisation arises, determines firm performance and under what conditions. Addressing specific context on management views of improvisation and performance of high technology-based companies in Malaysia, this significant contribution of the study is highly expected to provide very useful information to the Ministry of Science and Technology, and Innovation (MOSTI), Malaysia as well as the companies examined.

9.2.3. Summary of the Conceptualisation

Chapter 2 discussed the theoretical premise behind this study and provided a framework developed from strategic management and improvisation literatures. These literatures were reviewed to build a conceptual model of factors associated with organisational improvisation and subsequently, firm performance. At first, the chapter started by defining improvisation, which was followed by a review of improvisation from a strategic management perspective. From extant reviews of improvisation, improvisation from strategic management view and the reviews of underpinning theories of this study, the researcher then proposed the primary conceptual model of improvisation in strategic management (*see* Chapter 2, Section 2.6, Figure 2-1). It is believed that this is the first conceptual model development on improvisation from a strategic management perspective.

After the identification of improvisation within strategic management, extensive reviews were made to identify the factors associated with improvisation. In business operations, managers have to make an effort to

discover the absolute factors that could best fit in affecting organisational improvisation. It is hard to fine-tune the exact factors because no universal sets of strategies or influential factors are identifiable as being best for all businesses or firms (Hofer, 1975; Donaldson, 2001). Therefore, it is critical and beneficial to determine the theories underpinned this study. 'Strategy process' theory and contingency theory were used to examine the factors affecting organisational improvisation. The clarification of antecedent factors was rooted from 'strategy process' theory, which consists of managerial factors including the reasoning factors (rational and intuitive judgment), self-confidence, manager's expertise and attitude towards risk; and organisational factors (clarity of goal, minimal structure, organisational flexibility, organisational risk-taking, organisational information, and organisational memory). Meanwhile, the external factors, focused on the environmental forces that consist of technological turbulence, market turbulence and competitive turbulence, were bonded from the contingency theory perspective. The final conceptual model of this study can be found in Chapter 3, Section 3.2, Figure 3-1. Fifteen hypotheses were constructed in total which derived from the proposed related factors in accordance with the conceptual model (*see* the summary of hypotheses presented in Chapter 3, Section 3.4 and Table 3-2).

9.2.4. Summary of Research Design and Research Method

A cross sectional survey methodology was used to test the hypotheses of this study. In order to investigate improvisation from a strategic management perspective, the sample respondents were chosen among top management executives of high technology-based companies in Malaysia. The survey design method was deemed the primary data collection method and the questionnaire was based on the construction of items of each variable which were derived from a literature review and prior empirical research

(please refers to Chapter 4, Section 4.4.4, and Table 4-8).7-point scales were used in the questionnaire. This questionnaire was validated through pilot testing and face validity prior to the actual questionnaire is sent to the respondents. The details of the process of validating the questionnaire can be found in Chapter 4, Section 4.4.7.

In the actual data collection process, four waves of questionnaire mailings (as suggested by Dillman, 2000) were distributed to 1080 high technology companies. A notification letter was sent in the first wave; questionnaires were mailed in the second and fourth waves; and the third was a postcard reminder (*see* Chapter 4, Section 4.4.8). A follow-up call was done to a random sample of 50 non-respondents to encourage participation in the study and to boost the response rate.

A total of 128 usable questionnaire responses was achieved, which represents an effective response rate of 14% ($128/[1200-163]$) (*see* Chapter 5, Section 5.2, Table 5-2).This response rate is considered reasonable (Baruch, 1999) as the survey was voluntary and the sample was among top management executives in the companies where most of them had very tight and busy schedules.

9.2.5. Summary of Data Analysis Method

Chapter 5, 6 and 7 discussed the analyses and findings of the data. By using the SPSS version 16.0, the analysis of the data started with descriptive analysis of the profile of responding companies as well as the profile of those survey respondents (*see* Chapter 5, Section 5.2 and 5.3).This initial process is important in understanding the characteristics of the studied sample. A test of non-response bias was also assessed to ensure that these responses were representative for the population of this study (Armstrong and Overton, 1977)

as well as to develop the researcher's effort to purify and analyse the data for the later stages of empirical analyses (*see* Chapter 5, Section 5.2.2, 5.2.4, 5.3.2 and 5.4).

In Chapter 6, the validity and reliability of all underlying item constructs was examined in order to test the accuracy of the created hypotheses. To summarise the structure of a set variables and to purify measures of items used in this study, all scales were examined with principal components factor analysis. These results showed that the KMO measures of all scores were above the 0.5 threshold level for acceptability; and the Bartlett's test of sphericity showed highly significant relationship among all variables within a correlation matrix. Therefore the sampling was assumed to be adequate for further analysis (*see* Chapter 6, Section 6.2, Table 6-2). Further, the eigenvalues of all factor loadings in the principal component analysis were resulted according to subdivision in the conceptual model constructed (*see* Chapter 6, Section 6.2.1 through 6.2.6). Once all factorability and validity of the data were confirmed, Cronbach Alpha was used to examine construct reliability. Sixteen factors revealed the reliability of item constructs with Cronbach alpha scores above the recommended 0.70 threshold for acceptability, which indicates a good reliability as suggested by Nunally, 1978 (*see* to Chapter 6, Section 6.3). The summated scales were developed for further use in the hypotheses testing (*see* Chapter 6, Section 6.4). The validity was then tested again using item-total correlation analysis in order to gain additional evidence of the validation of all item constructs (*see* Chapter 6, Section 6.5, Table 6-11).

In Chapter 7, the descriptive analysis was used to screen all summated scales and the correlation analysis was employed to analyse the relationships between variables. The result showed that most variables were intercorrelated;

thus confirming the accuracy of the predicted hypotheses. The details of data screening through descriptive and correlation analysis can be found in Chapter 7, Section 7.2, and Table 7-1. During hypotheses testing, a standard multiple regression analysis was used to analyse *Hypotheses 1* through to *11*, while a hierarchical regression analysis was employed to test *Hypotheses 12* through to *15*. This different approach is due to the different way of linking between the variables. *Hypotheses 1* through to *11* were tried to examine the direct relationship between those factors (the direct association between independent and dependent variables). In this analysis, all independent (or predictor) variables were entered into the equation at once in order to examine the direct relationship between the whole set of independent variables and dependent variable (Coakes and Steed, 2003; Pallant, 2007). Meanwhile, the *hypothesis 12* was tested to investigate the improvisation-performance link and subsequently *hypothesis 13* through to *15* were attempted to identify the moderating factor that effect on the link between improvisation (independent variable) and firm performance (dependent variable). Prior to hypotheses testing, several assumptions were checked in order to get more accurate, reliable and significant results (Osborne and Waters, 2002). These analyses confirmed that there was no violation on the assumptions in the hypothesis testing. The details of the process of analysing the hypotheses can be found in Chapter 7, Section 7.3.

9.2.6. Summary of Hypotheses Results

The overall findings of the hypotheses-testing (*Hypothesis 1* to *15*) in this study of either supporting or refuting the hypothesis tests can be found in Chapter 7. A multiple regression analysis was used to analyse *Hypotheses 1* through to *11* and the results can be found in Chapter 7, Section 7.3.1 to 7.3.2. The total variance in organisational improvisation explained by all factors is 49.4%. These percentages confirm that the all managerial and

organisational factors substantially contribute to organisational improvisation. However, mixed (positive; negative or non-significant) results were identified when the association between each antecedent and improvisation was separately examined.

A hierarchical regression was employed to analyse *Hypothesis 12* through to *15*. The results of this hypothesis-testing can be seen in Chapter 7, Section 7.3.2. Initially, the result demonstrated that 9.4% of the total variance in firm performance was explained by organizational improvisation. However, once the environmental turbulence factors (technology, market and competitive turbulence) are introduced as a moderator, the result increases to 17.9% of a total variance. This result illustrates a significant difference of 8.5% (17.9% - 9.4%). Hence, it can be concluded that, overall, the moderating factors have a significant effect on the relationships between organizational improvisation and firm performance (as suggested by Crossan *et al.*, 2005 and Hmieleski and Corbett, 2008). But, mixed (positive; negative and non significant) results were found when the effect of each moderating factor was individually examined. A summary of findings can be found in Chapter 7, Table 7-4 and Figure 7-1.

9.3. Reflections on the Whole Research Process

Before the researcher discusses the implications of the study findings, it is important to reflect on the research process during the study. At first, the reflection is made regarding the principal idea on the development of the research model. Then, on how methodology was employed in this study. Lastly, the reflection on the research findings arising from this study is also reviewed.

In the beginning, the researcher discovered that several authors suggest that organisational improvisation can be viewed as part of the strategic management process (Moorman and Miner, 1998b; Baker *et al.*, 2003). The most appealing process of organisational improvisation is that it engages concurrent processes of strategic formulation and implementation (Moorman and Miner, 1998b; Cunha *et al.*, 2002; Baker *et al.*, 2003). However, this notion has found deficiency in strategic management and organisational improvisation literatures (Mintzberg, 1990; Crossan and Sorenti, 1997; Baker *et al.*, 2003; Vera and Crossan, 2005). Therefore, this general idea of the important role of improvisation in the strategic management process was then extensively reviewed in order to find detailed research gaps.

From various literature reviews, the researcher then discovered possible factors associated with improvisation. These factors were rooted in 'strategy process' theory and contingency theory. An in depth reviews was done in order to understand the underpinning theory on this conceptual model of the study (*see* Chapter 2, Section 2.7). 'Strategy as process' theory is relied upon to explain the antecedent factors behind the strategy formation aspect of organisational improvisation. This theory clearly states that antecedent factors that motivate strategy formation to occur (be it improvised or planned), are internal organisational structure issues, information (within the confines or bounded rationality) and the characteristics of those that execute the act of strategy formation (that is, the characteristics of the manager). So as to avoid the contradictory understandings between these two underpinning theories, it is important to note that internal factors are only to be examined in the model as antecedent factors and external contingencies only be assessed as element of the contingency aspect of the model.

Further, the researcher also made comprehensive reviews on the concept outside of the management literatures, such as reasoning factor from the managers (*see* Chapter 3, Section 3.3.1). Previous research were identified that this system of reasoning can have a positive significant relationship on improvisation (*e.g.* Crossan and Sorrenti, 1997; Weick, 1998; Leybourne and Sadler-Smith, 2006). In understanding the system of reasoning, two parallel cognitive systems of either rational (operates at the conscious level) or intuitive (operates at an automatic and preconscious level) need to be determined. This concept requires the reviewed from psychology literature in order to get better understandings on this variable.

Once all factors were finalised, three categories of factors were identified to construct the conceptual model of this study. The first sub-factor was managerial factors; the second was organisational factors; and finally, environmental turbulence was included as the external factor. The managerial factors consist of reasoning process (either rational or intuitive), manager's self-confidence, manager's expertise and manager's attitude towards risk. Meanwhile, the variables which represent organisational factors are clarity of goal, decentralised structure, organisational flexibility, organisational risk-taking, organisational information and organisational memory. For environmental turbulence, the factors include technological turbulence, market turbulence and competitive turbulence. These components were categorised based on prior studies (please refer in Chapter 3 for details).

Segregating risk attitude into two different perspectives (managerial and organisational risk) and testing both individually against improvisation might lead to potential argument. The first variable focused on manager's attitude towards risk, and the latter addressed organisational risk-taking. Nonetheless, from a strategic management point of view, managerial and

organisational risk should be separately acknowledged by the managers due to the conceptual differences (Baird and Thomas, 1985; Palmer and Wiseman, 1999). Managerial risk relates to the attitude of managers either courageously taking the risks or avoid from any situations involving with risks (thoroughly discussed in Chapter 3, Section 3.3.1.4); and it can be part of organisational risk (Palmer and Wiseman, 1999). Meanwhile, organisational risk can be views as the strategic behaviours in which the possibility of organisation may experience uncertain outcomes during their business operation such as the activities related to issues of innovation, research and development, debt financing and so forth (Baird and Thomas, 1985). To the best of the author's knowledge, there is no empirical evidence proving the association between risks (managerial and organisational) and organisational improvisation, specifically from the strategic management perspective. Therefore, these relationships were studied to examine the significance contribution to academics and practices (the implications to academics and practices can be found in Section 9.4).

With regards to the methodology employed, a cross-sectional survey methodology was used in this study to obtain data from the respondents (*see* Chapter 4, Section 4.3). This method is the right technique to be used in obtaining the primary observations from respondents (Bryman and Bell, 2007). By employing this method, the findings can be generalised to large population, in which it could be used to generalise the implications of high technology companies in Malaysia.

The model is argued to be of use to top management who are involved in the strategic management process. In this case, top management executives (*e.g.* CEO, CIO, COO, and Managing Director etc. *see* Chapter 4, Section 4.4.1) in high technology-based companies in Malaysia, were selected as sample

respondents. High technology companies were chosen due to the nature of this industry which are more expose to operate in highly competitive and turbulence environments in comparison with organisations in mature and stable industries (Morgan *et al.*, 2000; Doran and Gunn, 2002; Morgan and Strong, 2003). Most improvisational studies reveal that the tendency for organisational improvisation is higher for those companies facing high turbulence in the environment (Crossan *et al.*, 2002; Vera and Crossan, 2005).

Nonetheless, the process of identifying high technology-based companies in Malaysia was relatively inflexible because there was no absolute database representing the technology-based companies in Malaysia. The researcher had to search and identify the right directory and then choose the right companies in the list to target as sample respondents. The sample respondents were gathered from four different directories—Federation of Malaysia Manufacturers (FMM), Biotechnology Company, MESDAQ Company and Multimedia Super Corridor (MSC) Status Company (*see* Chapter 5, Section 5.2.1., and Table 5-1). The companies in these directories were selected as sample respondents. However, the researcher only chose the companies which were related to high-technology products or services (*see* Chapter 4, Table 4-5). The compilation of all companies from the above directories totalled 1080. A non-response bias test as suggested by Armstrong and Overton (1977) was used to determine whether there was a significant difference among the sectors, company size and respondents. The results presented from these three analyses suggest that non-response bias was not a significant problem to this study.

Three methods were employed in this study to gain high response rate from the sample respondents. The first method was, by obtaining the recommendation letter from the Ministry of Technology. The second method

was, by making four waves of mailings to sample respondents as suggested by Dillman *et al.* (2007) Tailored Design Method. Lastly, telephone calls were randomly made to questionnaire non-respondents. All processes were quite time consuming and it was hard to control. Therefore, it dragged the data collection process from the original plan of three months to four months of actual data collection. One of the examples that dragged the data collection process was the procedure to get the recommendation letter from the Ministry of Higher Technology and Innovation (MOSTI), Malaysia, which took approximately two months. The researcher had to make multiple contacts and develop a network and social capital with staff from the MOSTI department in order to obtain that recommendation letter.

Another reflection on this study concerns the research findings. Fifteen hypotheses were proposed in this study. All the hypotheses were based on an extensive review of past literatures. In this study, seven hypotheses were supported, and two were refuted. There were six results that were not supporting the hypothesis constructs. The following section discusses the implications and significance of these results, both for theory development and practitioners.

9.4. Implication of Study Findings: Theoretical and Managerial Issues

Overall, this study contributes significantly to theory development and practitioners by integrating a number of ideas that have previously been explored independently or conceptually. For example, only Leybourne and Sadler-Smith (2006) revealed a significant link between the reasoning process and improvisation in past studies (although focusing on intuition), while other scholars (Moorman and Miner, 1998b; Akgun and Lynn, 2002; Vera and Crossan, 2005; Crossan *et al.*, 2005; Chelminski, 2007; Souchon and Hughes, 2007) have studied the effect of team characteristics, organisational factors

and environmental turbulence on improvisation. The integration of these factors potentially leads to the development of a new improvisational construct (Weick, 1993, Crossan and Sorrenti, 1997 and Moorman and Miner, 1998b). The importance of organisational improvisation in strategic management processes further emphasizes the potential contribution of this new knowledge to theory development. By adopting organisational improvisation as a new tool in strategic management processes, it is beneficial for the company to build up its business process towards the achievement of its competence and competitiveness (Baker *et al.*, 2003). This research could be a useful guideline for managers in determining the possible factors affecting organisational improvisation in strategic management processes as well as to identify how organisational improvisation contributes to firm performance (Crossan *et al.*, 2005; and Hmieleski and Corbett, 2008). At the least, it is a first start for managers to be able to begin to determine how their own characteristics and the characteristics of their organisation is aiding or hindering the development of a capacity to improvise. Further, they can use the model to determine under what conditions they should improvise or whether it is not necessary to improvise at all (dependent on environmental conditions).

The next section will discuss thoroughly the theoretical and managerial implications of each finding from the hypotheses-testing. It starts with theoretical and managerial implications of managerial factors in which include reasoning factor (rational and reasoning) and individual manager's characteristics; then followed by organisational factors (consisting of characteristics of organisation; and information processing); and lastly the implication and contribution of environmental turbulence as moderating factor between organisational improvisation and firm performance.

9.4.1. Managerial Factors

The managerial factors of this study are reasoning and individual manager's characteristics. Having reasoning factors as part of the manager's cognitive ability that affects improvisation, it is believed that this finding can lead to a greater contribution to the 'strategy process' theory. There was a significant lack of empirical evidence pointing to the direction of reasoning being an integral part of improvisation and further, it was assumed that intuition alone was the primary driver of improvisation. To the best of the author's knowledge, this is the first empirical research that proves the importance of reasoning factors as a component of this approach towards organisational improvisation. The conceptual element of organisational improvisation is further developed and strengthened with the additional component of rational reasoning which is proven to be crucial. Moreover, the reasoning judgment, to some extent, may create either good or bad outcomes on the improvisational process (Weick, 1998; Crossan and Sorenti, 2002) and consequently drives either positive or negative impact on firm performance.

Based on *Hypothesis 1* (supported), a direct positive association between rational reasoning and improvisation is, to the author's best knowledge, the first empirical evidence contributed in the improvisation literatures. Previous research suggested that the rational reasoning process is much more related to strategic planning or is not considered to have any effect on improvisational activities (Weick, 1998; Leaptrott, 2006; Leybourne and Sadler-Smith, 2006). Surprisingly, this study revealed that rational reasoning does significantly affect the improvisational process within organisations, and hence supported the idea proposed by Moorman and Miner (1998b). According to their study, they suggested that the concurrent process of composition and execution during improvisational activity could influence the managers' rational reasoning rather than intuitive process. This implied that improvisation is a

deliberate; information-based process undertaken by design and not for the sake of convenience based on intuition (as thus rejected in *Hypothesis 2*).

In practice, managers need to carefully think of rationality in reasoning prior and when implementing organisational improvisation. Simply relying on intuitive reasoning may prove too risky or for some managers, misplaced. Some improvisational activity deals with millions or even billions of dollars of company's investment. Understandably, there is much at stake and most managers used rational instead of intuitive reasoning when implementing organisational improvisation according to the findings (*see Chapter 8*). Hence, having identified that rational reasoning was positively associated to organisational improvisation, this study offer managers or presumably, the potential improviser some insight and guideline to the aforementioned practices. Thus, it may well be time for practitioners and theorists to view improvisation as perhaps a strategic choice in itself, or more so, as a deliberate act that can and should (under given circumstances) be undertaken to boost performance. This clearly then has implications for strategic management theory and how strategy formation is typically viewed. Instead of seeing this as a step-by-step act, theorists can recognise that improvisation during the process can occur in order to change plans or implement specific actions faster. This could help to reconcile the problems regarding long-range planning and strategic fit where it is necessary to adapt rapidly in order to maintain fit but whilst retaining the need to plan.

As regards to individual manager characteristics, the research studied whether organisational improvisation is driven upon those three individual manager's factors (manager's self-confidence, manager's expertise and manager's attitude towards risk). The results implied that manager's self-confidence (*Hypothesis 3*) and manager's attitude towards risk (*Hypothesis 5*)

affect organisational improvisation and these findings may lead to a significant contribution into both the organisational improvisation literature and management practices. Although *Hypothesis 4* (manager's expertise) was individually not supported, when it tested as a whole, these hypotheses (*Hypothesis 3, 4 and 5*) significantly affected improvisation and therefore it could enrich the relevant body of knowledge. Previous research does not provide any evidence on these three elements of managerial factors (manager's self-confidence; and manager's attitude towards risk) that affect organisational improvisation. This study is the first empirical evidence supports the notion that improvisational activities can be influenced by individual managers (as is contended in strategy process theory), and in this context, the top managers such as CEO, COO, CIO, managing director and so forth. Understandably, a strong conceptual foundation on organisational improvisation would lead to better managerial practices and a more frequent application of the relevant subject.

The result from *Hypothesis 3, 4 and 5* implied that managers need to have towering self-confidence and a positive attitude towards risk in order to implement organisational improvisation. Having managerial expertise alone does not guarantee that a manager would pursue improvisation. However, the implementation of organisational improvisation is a real possibility once managerial expertise is armed together with abundant self-confidence and a positive attitude towards risk.

Having identified the importance of manager's self-confidence and attitude towards risk on organisational improvisation, it is also equally important to further understand the related antecedent factors. In other words, the results of this study suggested further exploration on what factors affect manager's self-confidence and attitude towards risk. Implementing this study

would not only enriching existing literature but also provide top managers with more information and better preparation. For instance, having identified all possible factors affecting self-confidence and risk attitudes, such as manager's experience or culture, top management of an organisation would be able to design a much better managerial training programme to implement organisational improvisation.

Taken together then, managers themselves can impel organisational improvisation to occur through their own characteristics and the application of them in decision-making. It should however be noted that whilst managerial factors can drive improvisation, it is important to concurrently understand the organisational factors that facilitate improvisation to occur.

9.4.2. Organisational Factors

The findings revealed that organisational factors as a whole (from structure and characteristics factors, as well as information processing) do affect improvisation on the whole. Individually, organisational risk taking, organisational flexibility and organisational real-time information affected improvisation. But surprisingly, organisational improvisation was not affected by clarity of goal, organisational structure nor organisational memory. It becomes clearer that rigid organisational goals, minimal structures and procedural memory within an organisation are not the key determinants for organisational improvisation. Though the results did not support the relevant hypotheses of the study, future research should investigate further these variables because they can be considered as chief elements rooted from 'strategy process' theory and existing improvisation research. The different culture, context and settings may be the reasons why the results of this study are not significant or differ from existing research. Moreover, many past studies tend to look at improvisation at different levels of analysis (*e.g.* team

improvisation) and as such this could provide an additional explanation for the results. Further investigation on these factors in future research could perhaps provide new implications for theories and practices.

The findings of the significance relationship between improvisation and organisational flexibility, organisational risk taking, and organisational information lead to contributions for theories and practices. Overall, these three factors can be considered as basic 'infrastructures' that should be facilitated or developed to provide a much better stepping stone for conducting organisational improvisation. With regards to flexibility, the findings for this characteristic add up to new empirical evidence in the improvisational literature. The finding suggests that flexibility in organisations should be adopted to enhance organisational improvisation (supporting the studies by Scribner, 1984; Akgun *et al.*, 2005). Whilst it is often assumed that flexibility is a desired outcome of improvisation it is also apparent here that flexibility is a necessary condition for improvisation to occur. Therefore, improvisation researchers may want to re-evaluate what they view as the outcomes of improvisation as they may well be drivers of it and furthermore, managers must provide the capacity and correct environment for flexibility if they wish to give rise to improvisation occurring. In future research, this finding could generate some ideas for scholars in identifying the antecedent factors that could drive the effectiveness of flexibility and its effect on improvisation and performance. Company experience and expertise, and culture adaptation are the antecedent factors that need to be considered in measuring the effectiveness of flexibility. Besides this, for managerial implications, the finding thus implies that organisational flexibility provides the ability to improvise organisational activities by committing resources to new courses of actions in response to those changes (Shimizu and Hitt, 2004). This organisational flexibility also

enables organisations to recognise and improvise promptly to respond to various demands and opportunities existing in a dynamic and uncertain competitive environment.

A good supporting platform such as favourable policy towards risk-taking would also lead to more organisational improvisation (as supported by Cunha and Cunha (2003) and Chelminski (2007)). There is an absence of empirical research testing these relationships; therefore it leads to new developments for management theory and practice. These results also imply that risk management cannot be constrained to only looking at managerial level risk attitudes, but organisational risk-taking can also provide the organisational improvisation. In this case, the finding implies that the more courage the organisation involves in its activities with uncertain outcomes, the stronger the execution of organisational improvisation. This means that, if an organisation is capable of investing heavily on innovation and participated in highly innovative product development that involved substantial research and development costs as well as high debt financing (Baird and Thomas, 1985), it also capable of engaging in improvisation where strategic formulation and implementation can emerge simultaneously. Beyond this, it can be argued that allowing organisational improvisation to occur in such circumstances is likely to be positive given its determined benefits for performance. In addition, this finding could also stimulate ideas for future study to identify the degree of organisational risk (either more towards risk taking or risk aversion) affecting organisational improvisation as well as firm performance. That is, we cannot comment here on whether there is such a thing as “too much risk taking” such that improvisation becomes potentially bad or has negative outcomes. Further research could investigate this potential relationship.

Lastly, the results on the relationship between organisational factors and improvisation also suggests that possessing accurate information of the business surroundings would also encourage managers to implement improvisation (supported by the research of Cunha *et al.*, 1999; McKnight and Bontis, 2002; Crossan *et al.*, 2005; Vera and Crossan, 2005; Leybourne, 2006). As the tendency of carrying out improvisation grows, it is increasingly vital for the practitioner to acknowledge the significant role of real-time information access and its relationships to organisational improvisation. By using effective information such as information on customer preferences, customer demand, and the weaknesses of their rivals, or technological innovation, top managers (practitioners) should be able improvise strategic actions accordingly. This finding also point to the requirement for managers not to necessarily make decisions on a whim but to have actual information at hand that allows them to at least make a considered judgement, be it rapid or spontaneous. The need for information remains the same, it is merely the time context that changes (from long time periods available in strategic planning to the need to make/implement decisions rapidly in short periods of time and thus, improvise).

As regards to management theory, this study provides strong support and contribution on the examination of association between information and improvisation. This could generate thoughts for future studies that the collective information access from all levels (operational level, middle line and top executive level) is critical to effective organisational improvisation especially in achieving the intended strategy (Moorman and Miner, 1998b) as well as to enhance firm performance.

The primary and most important contribution of this work however is thus: improvisation theory and its researchers must begin to recognise that

improvisation is not necessarily a pure “spur of the moment act” taken in the absence of thought, information and deliberation. The time context for taking the decision can vary (slow to immediate need for a decision) but the requirement for information and reasoned judgement (see the results for the opening hypotheses) remain. Improvisation, then, is not as illogical or irrational or even as intuitive as most improvisation theorists believe. Rather, these results would indicate improvisation is more a deliberate act or choice that managers undertake as a means of addressing their environment and decision-making requirement in the context of time available, need for decision speed, competitive conditions, internal demands etc. Consequently, these results demand a rethink of the improvisation construct, its definition and the research agenda surrounding it. Far too much emphasis has been given to looking at different types of improvisation at different levels (organisation, team, project) without developing a thorough understanding of the construct first at one level and delineating it clearly as a result.

9.4.3. Improvisation-Performance Relationship and Environmental turbulence as moderating factor

In strategic management study, there is an absence of empirical evidence on the investigation between organisational improvisation and firm performance as a whole. So far, this study is the first empirical research providing empirical evidence that reveals a significant positive relationship between organisational improvisation and firm performance from the strategic management perspective. Therefore this significant link can provide an empirical contribution to management and improvisation theories as well as managerial implications. The finding of the direct association between organisational improvisation and firm performance implies that improvisation is not only good for the success of new product development (as tested by Moorman and Miner, 1998b; Akgun and Lynn, 2002), but it also

can provide the enhancement of firm performance as a whole. Previously, some scholars have argued that improvisation may provide good or bad outcomes. This equivocal discussion in the literature has now been clarified by this research that organisational improvisation can generate a good outcome, which is to lead to superior performance. This implies that top managers or decision-makers of companies need to consider implementing improvisational activities in their organisations in order to gain and sustain superior firm performance.

Contingency theory informs us that the relationship between improvisation and performance is unlikely to be one of isolation, but rather affected by external contingencies. Consequently, the nature and strength of this relationship can change depending on the environmental conditions in which the firm operates. In testing moderating effects on the improvisation–performance link, the strength and type of relationship between improvisation and firm performance did change when moderated by environmental turbulence. The research findings identified both technological and competitive turbulence moderate the relationship between organisational improvisation and firm performance. Technological turbulence shows a negative moderating effect; meanwhile the competitive turbulence demonstrates a positive moderating effect on the improvisation–performance link. Market turbulence was found to have no moderating effect on the relationships between organisational improvisation and firm performance or in other words, in the presence of market turbulence improvisation did not have a significant relationship with performance.

Theoretically, examining the potential moderating effect of the environmental turbulence on the relationships between improvisation and firm performance has further enriched the relevant literature. It is the first

empirical research diagnosing this relationship and hence, adding the first empirical evidence on this subject. Prior studies (*e.g.* Moorman and Miner, 1998; Akgun and Lynn, 2002) mostly focus on the product innovation as dependent variable. This study mainly focuses on the firm performance because there is no evidence that traces the relationship between improvisation and organisational performance as a whole. In this study, the results implied that not all environmental turbulence factors can provide a moderating effect on the improvisation–performance link or are indeed positive. Improvisation and strategic management researchers must put forward the external elements of technological and competitive turbulence in their models as they can moderate the effect between improvisation and performance.

It is also a valuable reference to the managers currently planning or implementing improvisation within their respective organisations. In terms of managerial implications, the results signify that greater technological turbulence leads to situations where improvisation has a negative performance impact. This means that managers may need to consider the worthiness of implementing improvisation when the organisation is faced with high technological turbulence. Technological turbulence is considerably a change in pace of product and process technologies used to transform inputs into outputs (Jaworski and Kohli, 1993). This changing pace requires high investment by the company and hence supports Moorman and Miner's (1998b) study, which revealed that the effect of improvisation on cost efficiency becomes weaker and more negative, and consequently diminishes firm performance, as technological turbulence increases. In this case, fast changing environment specifically under technological turbulence obstructs the value of improvisation on performance (Atuantehe-Gima and Li, 2004). Managers must be wary then of blindly following an improvisational

approach without due consideration and respect for the environmental conditions in which the firm operates. Benign technological conditions allow for improvisers to prosper but in turbulent times this should be avoided. Presumably, the operational and opportunity costs of pursuing improvised decisions in times of technological turbulence outweigh any gains from fast-moving or rapid decision-making. This is likely to fall into the description of excessive risk-taking as alluded to earlier and as such demand further research into this.

In conditions of high competitive turbulence, on the other hand, the results of this study prove that competitive turbulence provides a positive moderating effect on the improvisation–performance relationship. This implies that improvisation is a key factor to increase firm performance (Moorman and Miner, 1998b; Akgun and Lynn, 2002, Vera and Crossan, 2005) specifically when the organisation faces a tough competitive environment (Cunha and Cunha, 2006). Under competitive turbulence, the competitors rapidly change their strategies (Kohli and Jaworski, 1990; 1993; Narver and Slater, 1990; Greenley, 1995). Therefore, it is necessary for organisation to employ the improvisational approach to enhance organisational performance, specifically when the organisation faces with competitive environment. Improvisation would appear to be the key to responding quickly enough to competitor actions so that the firm can proactively maintain and strengthen performance levels despite competitor actions. In addition, firms are likely to be able to entrench their market and competitive position if new competitors enter the arena when they have the capacity to improvise rather than relying on long-term plans which may not account for such changing scenarios. As such, the maintenance of strategic fit in these turbulent competitive conditions is best served through improvisation.

In certain industries the level of environmental turbulence might be different. In some circumstances, the company may be faced with very high technological turbulence but very low competitive and market turbulence; or vice versa. Future research should identify the effectiveness of environmental turbulence (either high or low) as moderating factor that can affect the relationship between improvisation and firm performance. Is there a u-shaped or inverted u-shaped relation for examples such that at extreme levels of turbulence there is a change in the nature of the relationship found?

9.5. Limitations and Directions for Future Research

This study has several limitations that require recognising. Firstly, the generalisability of this study's findings may be limited as only high technology-based companies in Malaysia were selected as sample respondents. Different types of firms or industries may require for future research to be undertaken because the results perhaps could be varied from this study. Having high technology-based companies as a unit of analysis shows the conditions of dynamic environments and involvement of improvisational approach during strategic management process. Other industries such as food industries where the environment is considerably stable (Kyriakopolous and Moorman, 2004) may possibly lead to provide different conditions and effect on improvisation. Beyond this, differing results may be derived in different countries and as such caution must be given to over generalising the results to contexts significantly different from those examined here.

Second, the measurement and classification of industrial stage (*e.g.* introductory stage, growth stage, maturity stage or declining stage) in high technology itself has not been identified in this study. Industry structure is a strong determinant of firm performance (McGahan and Porter, 1997). Like for

example, prices for computer industry is declining dramatically during the growth stage (McGrath, 2001). The declining prices of computers will affect company sales turnover. In this case, the managers need to radically improvise on their marketing strategy to compete with rivals in the industry. While looking at the introductory industrial stage, most companies' actions have to be made according to proper planning process, where no or little improvisational activities perhaps arise. This signifies that, for future research, the identification of industry stage of the sample companies may play an important role on the relationships among improvisation, environmental turbulence, and firm performance.

Third, this study only focuses on organisational improvisation in the strategic management process. It is beneficial for future research to examine a comparative analysis between planning versus improvisation in strategic management perspective. Many scholars suggest strategic planning differs from improvisational process in strategic management. Planning processes are found to be deliberate processes while improvisation is based on emergent actions as it unfolds (Mintzberg *et al.*, 1990; Crossan and Sorrenti, 2002; Leaptrott, 2006; Leybourne and Sadler-Smith, 2006). Impressive results may possibly be initiated when investigating into these two different strategic processes; especially when examining the association between the cognitive ability (reasoning factors) of the managers (Truman, 1996; Burke and Miller, 1999; Leaptrott, 2006), or risk behaviours and the level of business process (either planning or improvisation).

Fourth, this study is a cross-sectional design and association in nature. The interpretation of conclusions of the findings must be cautioned as a result (Gilley *et al.*, 2002; Akgun *et al.*, 2007). For example, one of the finding of this study suggests a positive significant relationship between rational reasoning

and improvisation (refer to the finding of *Hypothesis 1*). It is also possible to surmise that rational reasoning has an effect on improvisational activity due to sufficient information being available to the manager. This conclusion can be asserted because the finding between real-time information and improvisation is positive (refer to the finding of *Hypothesis 10*). In the absence of information would managers rely on intuition? Or would the need for rationality override this and therefore any improvisation? Future research should consider adding other causal factors affecting improvisation. For example, studying the effect of organisational information on the association between improvisation and performance needs to be highlighted. By adding other research methodology such as case study (John *et al.*, 2006) in examining the conclusions on the research findings, it is believed that the results could be more detailed and contributions to the body of knowledge on improvisation and subsequent managerial practice could be enriched.

A fifth limitation of this study is that it may be subject to common method bias. In this study, the same sample respondents were used for testing the independent variables and dependent variable. Both constructs (independent and dependent) were measured entirely with self-reported data. The same sample respondents were used due to no secondary data being available for access to be assessed for the performance indicator. Besides this, the limited time available and costs involved were also some of the main reasons why this study used the same sample respondents in testing for independent and dependent variables. Future research should consider attaining the data from different sample respondents. For instance, the data on firm performance is more significant when obtaining from other sources (Podsakoff and Organ, 1986).

Sixth, gathering the information from cross levels within organisation is also beneficial to eliminate sample method bias. According to John *et al.*, (2006), Akgun and Lynn (2002), Vera and Crossan (2005) employee or team characteristics could foster improvisation. In order to examine the organisational factors (*e.g.* flexibility and adaptability, information accessing) affecting improvisation, future study should consider obtaining data between top managerial executive (strategic level) and employees (middle and bottom line) within organisation. By having different people for sample respondents, it is hoped to provide different opinion within organisation and therefore eliminate the bias of the sample method. Besides, it is also crucial for future research to examine a comparative study between these two levels of executives in which it could conceivably demonstrate different perspectives and value on organisational improvisation.

Seventh, the absence of some variables limits some findings of this study. For instance, managerial expertise and experience may interact in decisions to adhere strictly to plans or deviate away (Geletkanycz and Black, 2001). There is evidently the need for future research to determine other possible variables for the conditions of organisational improvisation to occur. Whilst this does not detract from the work conducted here, it does indicate the need to look in greater depth into these variables.

In turning to future research, future studies should consider organisational culture as this has likely some bearing on improvisation given the findings and how they differ from previous research examining [predominantly] western companies. Culture in the organisation can be one of the factors that support improvisational activity (Crossan *et al.*, 2005; Leybourne, 2006; Chelminski, 2007). The practice and adaptation of corporate culture and norms which reflect the way managers think, share values and

the level of commitment among organisational members may be one of the factors why results vary between past and current research (*see* Chapter 8). It provides either a positive or negative impact on the company and in turn, improvisation. The identification of the adoption of company's culture could thus help to clarify whether this element drives organisational improvisation.

It is necessary for improvisation researchers to look again at the circumstances surrounding improvisation and why it may or may not occur. Beyond the managerial and organisational factors examined here, it would be wise and pertinent to examine other characteristics of these factors or indeed consider the issue of motivation to improvise, and in that regard, whether the firm is able to improvise. Furthermore, it would be wise for future research to examine in greater depth the likelihood that managerial discretion impacts upon the propensity to improvise (Finkelstein and Hambrick, 1990). Managerial discretion would appear to vary by context and is somewhat associated with environmental turbulence. But discretion can also be limited by scarce resources, change resistance and agendas and so forth, as such, this could provide a fertile ground for empirical investigation into understanding organisational improvisation.

The interplay between planning and improvisation was also not considered in this study. Whilst this was logical given the predominant desire to understand organisational improvisation, it is also clear that planning is critical to strategy formation. Scholars perhaps need to now understand not what leads toward improvisation occurring, but what motivates the need to deviate from planning. Clearly, the consideration of strategic fit is an issue but normative strategic management thinking has long discussed strategic fit and the need to maintain adaptiveness but has had little to say about how this can be achieved. Typically planning is seen as the mechanism to create the right

strategy but what about its evolution and fit? It is not necessary that strategic managers face a bivariate choice between planning or improvisation. Further, organisations could still follow long-term planning but improvise during the process to implement rapidly critical actions that need to be taken in the short-term to maintain strategic fit and address changing competitive conditions.

The findings in relation to rationality and intuition warrant further investigation. Is it the case that the context examined gave rise to the results or are there problems with previous research that implicitly build intuition into their definitions and operationalisations of improvisation? Therefore, giving rise to positive associations through misspecified operationalisations? Whatever the cause the results are intriguing as they dispel typical assertions in the improvisation literature. Is improvisation indeed a rational and deliberate act that can be chosen by managers and organisations? Or is it truly spontaneous and based on gut feelings? These questions require immediate attention and could provide much needed clarity to the delineation of organisational improvisation and the literature itself.

Finally, this study pertinently focused on two elements: the internal factors and the environmental turbulence as contingent factors. The internal factors included reasoning judgment, characteristics and attitude of the manager, organisational characteristics and information processing; whereas, the environmental turbulence consists of technological, market and competitive turbulence. Some scholars assert that improvisation occurs due to the effect of time pressure and level of uncertainty facing the company (Crossan and Sorenti, 1997; Crossan *et al.* 2005). In this study, environmental turbulence was used to examine the level of uncertainty. However, time pressure has not been explored in this study. In determining the scenario of

improvisation in the strategic management process, time pressure and level of turbulence (either high or low turbulent) should be assessed together. Therefore future studies need to extend this research model by considering time pressure as another influential factor on organisational improvisation. Consequently, this may demand a shift toward longitudinal research. Indeed, longitudinal research is uncommon in the improvisation literature despite its typically defined temporal nature.

9.6. Concluding Remarks

This chapter concluded the whole thesis by revisiting earlier chapters and summarising important elements of the study. This includes summarisation of the research objective, research questions, conceptualisation, research design, data analysis, and the hypothesis results. The researcher's reflections on the research processes were also discussed thoroughly in this chapter. Subsequently, the importance of conducting this research and its implications to both theoretical and managerial aspects were comprehensively discussed. In the end, limitations and future directions of this study were presented elaborating both the deficiencies in the work and the things that potentially need to be done beyond this research.

Addressing extensive literature, managing the whole process of research design, collecting primary data and analysing the research findings has also improved the researcher's skills and know-how on implementing scientific research. It is also acknowledgeable that organisational improvisation in strategic management is undeniably crucial and inviting numerous potential research in this very relevant field considering the dynamic environments firms face in these uncertain times. Specifically, this study on the effect of internal and external factors on organisational

improvisation and firm performance makes telling contributions to the existing body of knowledge as well as to practitioners.

To conclude, it is apparent that improvisation is important as a decision-making mechanism for improving performance and undertaking the act of improvisation should not be considered independent of the environmental conditions the firm faces. Further, if improvisation is deemed the way forward, managers themselves as well as organisational factors can motivate and drive improvisation to occur by creating a climate that fosters this to happen.

References

A

- Aaker, D. A. and Mascarenhas, B. (1984). The Need for Strategic Flexibility. *Journal of Business Strategy*, 5(Fall): 74-82.
- Acklesberg, R. and Arlow, P. (1985). Small business does plan and it does pay off. *Long Range Planning*, 18(5): 61-67.
- Akgün, A. E., Lynn, G. S., and Yilmaz, C. (2005). Learning process in new product development teams and effects on product success: A socio-cognitive perspective. *Industrial Marketing Management*, 35(2): 210-224.
- Akgün, A.E. and Lynn, G.S. (2002). New product development team improvisation and speed-to-market: an extended model. *European Journal of Innovation Management*, 5(3): 117-129.
- Akgün, A.E., Byrne, J.C., Lynn, C.L. and Keskin, H. (2007). New product development in turbulent environments: Impact of improvisation and unlearning on new product performance. *Journal of Engineering and Technology Management*, 24(3): 203-230.
- Akgün, A.E., Lynn, G.S., Byrne, J.C. (2006). Antecedents and consequences of unlearning in new product development teams. *Journal of Product Innovation Management*, 23(1): 73-88.
- Allison, G. (1971). *Essence of Decision*. New York, NY: Little, Brown & Co.
- Amabile, T.M. (1996). *Creativity in context: Update to social psychology of creativity*. Boulder, CO: West View Press.
- Amabile, T.M. (2001). Beyond talent: John Irving and the passionate craft of creativity. *American Psychologist*, 56(4): 333-336.
- Andersen, T. (2004). Integrating decentralized strategy making and strategic planning processes in dynamic environments. *Journal of Management Studies*, 41(8): 1271-1299.
- Andrews, K. R. (1971). *The Concept of Corporate Strategy*. Homewood, IL: Irwin.

References

- Anand, V., Manz, C.C. and Glick, W.H. (1998). An Organizational Memory Approach to Information Management. *Academy of Management Review*, 23(4): 796-809.
- Ansoff, H.I. (1987). The Emerging Paradigm of Strategic Behavior. *Strategic Management Journal*, 8(6): 501-515.
- Ansoff, H.I. (1991). Critique of Henry Mintzberg's the design school: Reconsidering the basic premises of strategic management. *Strategic Management Journal*, 12(6): 449-461.
- Aram, J.D. and Walochik, K. (1996). Improvisation and the Spanish manager. *International Studies of Management and Organization*, 26(4): 73-90.
- Armstrong and Overton (1977). Estimating nonresponse bias in mail surveys, *Journal of Marketing Research*, 14(3): 396-402.
- Arnold, H.J. and Feldman, D.C. (1981). Social Desirability response bias in self-report choice situations. *Academy of Management Journal*, 24(2): 377-385.
- Ashill, N. J., Frederikson, M., and Davies, J. 2003. Strategic marketing planning: A grounded investigation. *European Journal of Marketing*, 37(3/4): 430-461.
- Atuahene-Gima, K. and Li, H (2004). Strategic decision comprehensiveness and new product development outcomes in new technology ventures. *Academy of Management Journal*, 47(4): 583-597.
- Atuahene-Gima, K. and Murray, J.Y. (2004). Antecedents and outcomes of marketing strategy comprehensiveness. *Journal of Marketing*, 68(October): 33-46.
- Auh, S. and Menguc, B. (2007). Performance implications of the direct and moderating effects of centralization and formalization on customer orientation. *Industrial Marketing Management*, 36(8): 1022-1034.

B

- Badarulzaman, (1998). *High technology industrial park and impact on regional development in Malaysia*. School of Housing, Building and Planning, USM. Available at: <http://www.hbp.usm.my/methods/hitechpark.html>

References

- Bailey, A., Johnson, G. and Daniels, K. (2000). Validation of a multi-dimensional measure of strategy development processes. *British Journal of Management*, 11(2): 151-162.
- Baird, I.S. and Thomas, H. (1985). Toward a contingency model of strategic risk taking. *The Academy of Management Review*, 10(2): 230-243.
- Baker, T, Miner, A. and Easley, D. (2003). Improvising firms: Bricolage, account giving and improvisational competencies in the founding process. *Research Policy*, 32(2): 255-276.
- Balachandra, L., Bordone, R. C., Menkel-Meadow, C., Ringstom, P. and Sarath, E. (2005). Improvisation and Negotiation: Expecting the unexpected. *Negotiation Journal*, 21(4): 415-423.
- Balnaves, M. and Caputi, P. (2001). *Introduction to Quantitative Research Methods: An Investigative Approach*. London: Sage Publications.
- Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs: Prentice Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Barney, J.B. and Hesterley, W.S. (2006). *Strategic management and competitive advantage: concepts and cases*. New Jersey: Pearson Prentice Hall.
- Barret F.J. and Nissen, M.E. (2008). Self-Organization and synchronization at the edge: Situated action, identity and improvisation. *13th International Command and Control Research and Technology Symposium: C2 for Complex Endeavors*, Organizational Issue Track: 1-18.
- Barret, F.J. (1998). Coda: Creativity and improvisation in organizations: Implications for organizational learning. *Organizational Science*, 9(5): 605-622.
- Bartlett, C. A. and Ghoshal, S. (1993). Beyond the M-Form: Toward a managerial theory of the firm. *Strategic Management Journal*, 14(Special Issue): 23-46.
- Baruch, Y. (1999). Response rate in academic studies: A comparative analysis. *Human Relations*, 52 (4): 421-438.

References

- Bastien, D.T. and Hostager, T.J. (1988). Jazz as a process of organizational innovation. *Communication Research*, 15(5): 582-602.
- Beinhocker, E.D. and Kaplan, S. (2002). Tired of strategic planning? *The McKinsey Quarterly 2002 Special Edition: Risk and Resilience*: 49-56.
- Berdie, D. R., Anderson, J. R., and Niebuhr, M. A. (1986). *Questionnaire: Design and Us*. 2nd. Ed., Metuchen, New Jersey: Scarecrow Press.
- Berente, N., Vandenbosch, B., and Aubert, B., (2009). Information flows and business process integration. *Business Process Management Journal*, 15(1): 119-141.
- Berliner, P.F. (1994). *Thinking in Jazz: The infinite art of improvisation*. Chicago: University of Chicago Press.
- Bettis, R.A. (1982). Risk considerations in modeling corporate strategy. *Proceedings of the 1982 National Academy of Management Meetings*: 22-25.
- Birkinshaw, J., Nobel, R. and Ridderstråle, J. (2002). Knowledge as a contingency variable: Do the characteristics of knowledge predict organization structure? *Organization Science*, 13(3): 274-289
- Bourgeois, L.J. (1985). Strategic goals, perceived uncertainty, and economic performance in volatile environments. *Academy of Management Journal*, 28(3): 548-573.
- Bovey, W.H. and Hede, A. (2001). Resistance to organizational change: the role of cognitive and affective processes. *Leadership & Organization Development Journal*, 22(8): 372 - 382.
- Bowman, E.H. (1982). Risk seeking by troubled firms. *Sloan Management Review*, 23(4): 33-42.
- Boyd, B.K (1991). Strategic planning and financial performance: A meta-analytical review. *Journal of Management Studies*, 28(4): 354-374.
- Brace, N., Kemp, R. and Snelgar, R. (2006). *SPSS for psychologists: A guide to data analysis using SPSS for Windows (Version 12 and 13)*. 3rd Ed., New York: Palgrave Macmillan.
- Bracker, J.S, Keats, B.W. and Pearson, J.N. (1988). Planning and financial performance among small firms in a growth industry. *Strategic Management Journal*, 9(6): 591-603.

References

- Bracker, J.S. and Pearson, J.N. (1986). Planning and financial performance among small, mature firms. *Strategic Management Journal*, 7(6): 503-522.
- Brews, P.J. and Hunt, M.R. (1999). Learning to plan and planning to learn: Resolving the planning school/learning school debate. *Strategic Management Journal*, 20(10): 889-913.
- Brown, S.L. and Eisenhardt, K.M. (1995). Product development: Past research presents findings, and future directions. *Academy of Management Review*, 20(2): 343-378.
- Brown, S.L. and Eisenhardt, K.M. (1997). The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*, 42(3): 1-34.
- Bryman, A. (2001). *Social Research Methods*. New York: Oxford University Press.
- Bryman, A. and Bell, E. (2007). *Business Research Methods*. 2nd Ed., New York: Oxford University Press Inc.
- Burke, L.A. and Miller, M.K. (1999). Taking the mystery out of intuitive decision-making. *Academy Management Executive*, 13(4): 76-91.
- Burns, R. B. (2000). *Introduction to Research Methods*. Thousand Oaks, CA: Sage.
- Burns, T. and Stalker, G.M. (1961). *The management of innovation*. Oxford: Oxford University Press.
- Burt, D. (1978). Planning and performance in Australian retailing. *Long Range Planning*, 11(June): 62-68.
- Butchart, R.I. (1987). A new UK definition of the high technology industries. *Economic Trends*, 4(February): 82-8.
- Buzzell, R. D. and Gale, B. T. (1987). *The PIMS Principles: Linking Strategy to Performance*. New York, NY: The Free Press.

C

- Calantone, R., Garcia, R. and Droge, C. (2003). The effects of environmental turbulence on new product development strategy planning. *The Journal of Product Innovation Management*, 20(2): 90-103.

References

- Calantone, R.J., Kim, D., Schmidt, J.B., and Cavusgil, S.T. (2006). The influence of internal and external firm factors on international product adaptation strategy and export performance: A three-country comparison. *Journal of Business Research*, 59(2): 176-185.
- Campbell, D.T., and Fiske, D.W. (1959). Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix. *Psychological Bulletin* (56:2, March): 81-105.
- Capon, N., Farley, J.U. and Hulbert, J.M. (1994). Strategic Planning and financial performance: More evidence. *Journal of Management Studies*, 31(1): 1054-110.
- Cespedes, F. V. and Piercy, N. F. (1996). Implementing marketing strategy. *Journal of Marketing Management*, 12(1): 135-160.
- Chaffee, E. E. (1985). Three models of strategy. *Academy of Management Review*, 10(1): 89-98.
- Chakravarthy, B. S. (1986). Measuring strategic performance. *Strategic Management Journal*, 7(5): 437-458.
- Chakravarthy, B. S. and Doz, Y. (1992). Strategy process research: Focusing on corporate self-renewal. *Strategic Management Journal*, 13(Special Issue): 5-14.
- Chakravarthy, B.S. (1997). A new strategy framework for coping with turbulence. *Sloan Management Review*, 38(2): 69-82.
- Chandler, A. (1987). *Strategy and Structure*. Cambridge, MA: MIT Press.
- Chelariu, C., Johnston, W.J. and Young, L. (2002). Learning to improvise, improvising to learn a process of responding to complex environments. *Journal of Business Research*, 55(1): 141-147.
- Chelminski, P. (2007). A cross-national exploration of the potential cultural antecedents of organizational improvisation. *Journal for Global Business Advancement*, 1(1): 114-126.
- Child (1975), in Donaldson, L. (2001). *The contingency theory of organizations*. Thousand Oaks: Sage Publications

References

- Churchill G.A. and Iacobucci, D. (2002). *Marketing research: Methodological foundations*. 8th Ed., Orlando, FL: HarcourtCollege Publishers.
- Churchill, G. A. (1995). *Marketing research: methodological foundations*. Fort Worth, TX: The Dryden Press.
- Churchill, G. A., Jr. (1999). *Marketing Research: Methodological Foundations*. 7th Ed., Fort Worth, TX: The Dryden Press.
- Ciborra, C.U. (1996). The platform organization: recombining strategies, structures, and surprises. *Organizational Science*, 7(2):103-118.
- Ciborra,C.U.(1999). Notes on time and improvisation. *Accounting, Management and Information Technologies*, 9(1): 77-94.
- Clark, B. H. and Montgomery, D. B. (1998). Deterrence, reputations, and competitive advantage. *Management Science*, 44(1): 62-82.
- Clark, B. H. and Montgomery, D. B. (1999). Managerial identification of competitors. *Journal of Marketing*, 63(3): 67-83.
- Coakes, S.J. and Steed, L.G. 2003. *SPSS analysis without anguish: Version 11.0 for Windows*. Australia: John Wiley & Sons.
- Cohen, W. M. (1991). Individual learning and organizational routine:
Emerging connections.*Organization Science*, 2(February): 135-139.
- Cohen, M.D. and Bacdayan, P. (1994). Organizational routines are stored as procedural memory: Evidence from a laboratory study. *Organization Science*, 5(4): 554-568.
- Cooper, R.G., Edgett, S.J., Kleischmidt, E.J. (1998). *Portfolio Management for New Products*, Reading, MA: Addison-Wesley.
- Corbett, A. C. (2006). Proclivity for improvisation as a predictor of entrepreneurial intentions. *Journal of Small Business Management*, available at: <http://www.allbusiness.com/management/870921-1.html>
- Corey, E. R. and Star, S. H. (1971). *Organizing strategy: A marketing approach*. Boston, MA: HarvardBusinessSchool, Division of Research.
- Cornelissen, J. (2005). Beyond compare: Metaphor in organization theory. *Academy of Management Review*, 30(4): 751-764.

References

- Covin, J. G., Slevin, D. P. and Schultz, R. L. (1997). Top management decision sharing and adherence to plans. *Journal of Business Research*, 40(1): 21-36.
- Creswell, J.W. (2009). *Research design: Qualitative, Quantitative, and Mixed Methods Approaches*. 3rdEd., United Kingdom: SAGE Publications Ltd.
- Crossan, M., Cunha, M. P., Vera, D., and Cunha, J. (2005). Time and organizational improvisation. *Academy of Management Review*, 30(1): 129-145.
- Crossan, M.M. (1997). Improvise to innovate. *Ivey Business Quarterly*, 62(1): 37-42.
- Crossan, M.M. (1998). Improvisation in action. *Organization Science*, 9(5): 593-599.
- Crossan, M.M. and Sorrenti, M. (1997). Making sense of improvisation. *Advances in Strategic Management*, 14(14): 155-180.
- Crossan, M.M., White, R.E., Lane, H.W. and Klus, L. (1996). The improvising organization: Where planning meets opportunity. *Organizational Dynamics*, 24(4): 20-35.
- Cummings, S. and Wilson, D. (2003). *Images of Strategy*. Oxford: Blackwell Publishing Ltd.
- Cunha, M.P. and Cunha, J.V. (2001). Managing improvisation in cross cultural virtual teams. *International Journal of Cross Cultural Management*, 1(2): 187-208.
- Cunha, M.P. and Cunha, J.V. (2003). Organizational improvisation and change: Two syntheses and a filled gap. *Journal of Organizational Change*, 16(2): 169-185.
- Cunha, M.P. and Cunha, J.V. (2006a). Towards the improvising organization. *Business Leadership Review*, 3(4): 1-4.
- Cunha, M.P. and Cunha, J.V. (2006b). Towards a complexity theory of strategy. *Management Decision*, 44(7): 839-850.
- Cunha, M.P., Cunha, J.V., and Kamoche, K. (1999). Organizational improvisation: What, when, how and why. *International Journal of Management Review*, 1(3): 299-341.

References

- Cunha, M.P., Cunha, J.V., and Kamoche, K. (1999). Organizational improvisation: What, when, how and why, *in* Kamoche, K.N., Cunha, M.P. and Cunha, J.V. (2002). *Organizational Improvisation*. London: Routledge.
- Cunha, M.P., Kamoche, K. and Cunha, J.V., (2003). Organizational improvisation and leadership: A field study in two computer-mediated settings. *International Studies of Management and Organization*, 33(1): 34-57.
- Curasi, C. F. (2001). A critical exploration of face-to-face interviewing vs. computer-mediated interviewing. *International Journal of Market Research*, 43(4): 361-375.
- Cureton, E.E. and D'Agostino, R.B. (1983). *Factor Analysis, an Applied Approach*. Hillside, NJ: Place of Publication.
- Cyert, R. M. and March, J. G. (1963). *A Behavioral Theory of the Firm*. Englewood Cliffs N.J.: Prentice-Hall.

D

- Das, T.K. (2003). Managerial perceptions and the essence of the managerial world: What is an interloper business executive to make of the academic-researcher perceptions of managers? *British Journal of Management*, 14(1): 23-32.
- David, F. (2001). *Strategic Management: Concept and Cases*. 8th Ed., New Jersey: Prentice Hall.
- Day, G.S. (1994). The capabilities of market-driven organizations. *Journal of Marketing*, 58(4): 37-52.
- Day, G.S. and Nedungadi, P. (1994). Managerial representations of competitive advantage. *Journal of Marketing*, 58(2): 31-44.
- de Vaus, D. A. (2002). *Analyzing Social Science Data*. Thousand Oaks, CA: Sage.
- Dean, J. W., Jr. and Sharfman, M. P. (1993). Procedural Rationality in the Decision Making Process. *Journal of Management Studies*, 30(4): 587-610.
- Delmar, F. and Shane, S. (2003). Does business planning facilitate the development of new ventures? *Strategic Management Journal*, 24(12): 1165-1185.

References

- Deshpande, R. and Zaltman, G. (1982). Factors affecting the use of market research information: A path analysis. *Journal of Marketing Research* 19(1): 14-31.
- Dess, G.G. and Robinson, R.B. (1984). Measuring organizational performance in the absence of objective measures: The case of privately-held firm and conglomerate business unit. *Strategic Management Journal*, 5(July-September): 265-273.
- Dhanani, S., O'Shaughnessy, N. and Louw, E. (1997). Marketing practices of UK high technology firms. *Logistic Information Management*, 10(4): 160-166.
- Dickson, P. (1992). Toward a general theory of competitive rationality. *Journal of Marketing*, 56(1): 69-83.
- Dillman, D. A. (2000). *Mail and Internet surveys -The Tailored Design Method*. New York: John Wiley & Sons, Inc.
- Dillman, D.A., Smyth, J.D. and Christian, L.M. (2007). *Mail and Internet Surveys: The tailored design method*. 2ndEd., USA: John Wiley & Sons.
- Donaldson, L. (2001). *The contingency theory of organizations*. Thousand Oaks: Sage Publications.
- Doran, G. T. and Gunn, J. (2002). Decision-making in high-tech firms: Perspectives of three executives. *Business Horizons*, 45(6): 7-16.
- Dyba, T. (2000). Improvisation in small software organizations. *IEEE Software*, September/October: 82-87.

E

- Eastlack, J. and McDonald, P. (1970). CEOs role in corporate growth. *Harvard Business Review*, 48(May-June): 150-163.
- Eighth Malaysia Plan (2001-2005). Kuala Lumpur: Percetakan Nasional Malaysia Berhad.
- Eipstein, S. (1985). Integration of the Cognitive and the Psychodynamic Unconscious. *American Psychologist*, 49(8): 709-724.

References

- Eipstein, S, Pacini, R. Denes-Raj, V. and Heire, H. (1996). Individual differences in intuitive-experiential and analytical-reasoning thinking styles. *Journal of Personality and Social and Psychology*, 71(2): 390-405.
- Eisenhardt, K.M. (1989). Making fast strategic decision in high-velocity organization. *Academy of Management Journal*, 32(3): 543-576.
- Eisenhardt, K.M. (1997). Strategic decision and all that jazz. *Business Strategy Review*, 8(3): 1-3.
- Eisenhardt, K.M. and Tabrizi, B.N. (1995). Accelerating adaptive processes: product innovation in a global computer industry. *Administrative Science Quarterly*, 40(1): 84-110.
- Evans, J., Over, D. E. (1996). *Rationality and Reasoning*. East Sussex, UK: Psychology Press.
- Evans, J., Over, D. E. and Manktelow, K. I. (1993). Reasoning, decision making and rationality. *Cognition*, 49(1-2):165-187.
- Evans, S. J. (1991). Strategic flexibility for high technology maneuvers: A conceptual framework. *Journal of Management Studies*, 28(1): 69-89.

F

- Falshaw, J., Glaister, K. and Tatoglu, E. (2006). Evidence on formal strategic planning and company performance. *Management Decision*, 44(1): 9-30.
- Faraj, S. and Sproull, L. (2000). Coordinating expertise in software development teams. *Management Science*, 46(12): 1554-1568.
- Feldman, M.S. and Pentland B.T. (2003). Reconceptualizing organizational routines as a source of flexibility and change. *Administrative Science Quarterly*, 48(1): 94-118.
- Fiegenbaum A and Thomas H. (1988). Attitudes toward risk and the risk-return paradox: Prospect theory explanations. *Academy of Management Journal*, 31(1): 85-106.
- Field, A.P. (2005). *Discovering Statistics using SPSS*. 2nd Ed., London: Sage.
- Fink, A. (1995). *How to Sample in Surveys*. Thousand Oaks, California: Sage.

References

- Finkelstein, S. and Hambrick, D. C. (1990). Top-management-team tenure and organizational outcomes: The moderating role of managerial discretion. *Administrative Science Quarterly*, 35(3): 484-503.
- Ford, R. (2008). Complex adaptive systems and improvisation theory: Toward framing a model to enable continuous change. *Journal of Change Management*, 8(3-4): 173-198.
- Fredrickson, J. W. (1984). The comprehensiveness of strategic decision processes: Extension, observations, future directions. *Academy of Management Journal*, 27(3): 445-466.
- Fredrickson, J.W., Mitchell, T.R. (1984). Strategic decision processes: Comprehensiveness and performance in an industry with an unstable environment. *Academy of Management Journal*, 27(2): 399-423.

G

- Galbraith, C.S. and Merril, G.B. (1991). The effect of compensation program and structure on SBU competitive strategy: A study of technology-intensive firms. *Strategic Management Journal* 12(5): 353-370.
- Galliers, R.D. (1992). Choosing information systems research approaches. In Galliers, R.D. (ed), *Information system research: Issues, methods and practical guidelines*. Oxford: Blackwell Scientific.
- Gandek, B. and Ware Jr., J.E. (1999). Methods for validating and norming translations of health status questionnaires: The IQOLA project approach. *Journal of Clinical Epidemiology*, 51(11): 953-959.
- Gardner, D.M., Johnson, F. Lee, M. and Wilkinson, I. (2000). A contingency approach to marketing high technology products. *European Journal of Marketing*, 34(9/10): 1053-1077.
- Garg, V.K., Walters B.A. and Priem R.L. (2003). Chief executive scanning emphases, environmental dynamism, and manufacturing firm performance. *Strategic Management Journal*, 24(8): 725-744.
- Geletkanycz, M. A. (1997). The salience of 'culture's consequences': The effects of cultural values on top executive commitment to the status quo. *Strategic Management Journal*, 18(8): 615-634.

References

- Geletkanycz, M. A. and Black, S. S. (2001), "Bound by the past? Experience-based effects on commitment to the strategic status quo. *Journal of Management*, 27(1): 3-21.
- Gerbing, D. W. and Anderson, J. C. (1988). An Updated Paradigm for Scale Development Incorporating Undimensionality and its Assessment. *Journal of Marketing Research*, 25(May): 186-192.
- Gibbons, P.T. and O'Connor, T. (2005). Influences on strategic planning processes among Irish SMEs. *Journal of Small Business Management*, 43(2): 170-187.
- Gilley, K.M. and Walters, B.A. (2002). Top management team risk taking propensities and firm performance: Direct and moderating effects. *Journal of Business Strategies*, 19(2), 95-114.
- Gilley, K.M., Greer, C.R. and Rasheed, A.A. (2002). Human resource outsourcing and organizational performance in manufacturing firms. *Journal of Business*, 57(3): 232-240.
- Gioia, D.A. and Manz, C.C. (1985). Linking cognition and behavior: A script processing interpretation of vicarious learning. *The Academy of Management Review*; 10(3): 527-539.
- Glazer, R. (1991). Marketing in an information-intensive environment: Strategic implications of knowledge as an asset. *Journal of Marketing*, 55(October): 1-19.
- Gluck, F.W. Kaufman, S.P. and Walleck, H.S. (1980). Strategic management for competitive advantage. *Harvard Business Review*, 58(4): 154-161.
- Golding, A. (2009). *Carex launches hygiene campaign after profiting from swine flu outbreak*. Available at: <http://www.marketingmagazine.co.uk>
- Gorsuch, R. L. (1983). *Factor analysis*. 2nd Ed., Hillsdale, NJ: Erlbaum.
- Good, D.J. and Stone, R.W. (2000). The impact of computerization on marketing performance. *Journal of Business and Industrial Marketing*, 15(1): 34-56.
- Govindarajan, V. (1988). A contingency approach to strategy implementation at the business-unit level: Integrating administrative mechanisms with strategy. *Academy of Management Journal*, 31(4): 828-853.

References

- Grandori, A. (1984). A prescriptive contingency view of organizational decision making. *Administrative Science Quarterly*, 29(2): 192-209.
- Grant, R. (2003). Strategic planning in a turbulent environment: Evidence from the oil majors. *Strategic Management Journal*, 24(6): 491-517.
- Greenley, G.E. (1986). Does strategic planning improve company performance? *Long Range Planning*, 19(2): 101-109.
- Greenley, G.E. (1995). Market orientation and company performance: empirical evidence from UK companies. *British Journal of Management*, 6(March): 1-13.
- Gresov, C. (1989). Exploring fit and misfit with multiple contingencies. *Administrative Science Quarterly*, 34(3): 431-453.
- Gresov, C. (1989). Exploring fit and misfit with multiple contingencies. *Administrative Science Quarterly*, 34(3): 431-465.
- Grewal, R. and Tansuhaj, P. (2001). Building organizational capabilities for managing economic crisis: The role of market orientation and strategic flexibility. *Journal of Marketing*, 65(April): 67-80.
- Gross, A. and Minot, J. (2007). Recruiting and HR consulting in Asia: Malaysia HR Update – 2007. Available at www.pacificbridge.com/publication.asp?id=99.
- Grunenwald, J. and Vernon, T.T. (1988). Pricing decision making for high-technology products and services. *Journal of Business and Industrial Marketing*, 3(1): 61-70.
- Guba, E.G. and Lincoln, Y.S. (1994). Competing paradigms in qualitative research. In Denzin NK, Lincoln YS, editors. *Handbook of qualitative research*. London: Sage;
- Gupta, A.K., Smith, K.G., and Shalley, C.E. (2006). The interplay between exploration and exploitation. *Academy of Management Journal*, 49(4): 693-706.

H

- Hague, P. and Harris, P. (1993). *Sampling and Statistics*. London: Kogan Page.

References

- Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (1998). *Multivariate Analysis*. 5th Ed., New Jersey: Prentice Hall.
- Hall, D. J. and Saias, M. A. (1980). Strategy follows structure! *Strategic Management Journal*,1(2): 149–163.
- Hambrick, D. C. and Lei, D. (1985). Toward an empirical prioritization of contingency variables for business strategy. *The Academy of Management Journal*, 28(4): 763-788
- Hambrick, D. C., Geletkanycz, M. A. and Fredrickson, J. W. (1993). Top executive commitment to the status quo: Some tests of its determinants. *Strategic Management Journal*, 14(6): 401-418.
- Hambrick, D.C. and Mason, P.A. (1984). Upper echelons: The organization as a reflection in of its top managers. *Academy of Management Review*, 9(2): 193-206.
- Hamel. G. and Prahalad, C.K. (1994). *Competing for the future: Breakthrough strategies for seizing control of your industry and creating the markets of tomorrow*. Boston: HarvardBusinessSchool Press.
- Hamilton, R.T., and Shergill, G.S. (1992). The relationship between strategy-structure fit and financial performance in New Zealand: Evidence of generality and validity with enhanced controls. *Journal of Management Studies*, 29(1): 95-113.
- Hammond, J.S., Keeney, R.L. and Raiffa, H. (1998). The hidden traps in decision making. *Harvard Business Review*, 84(1): 118-126.
- Harrington, R.J., Lemak, D.J., Reed, R., Kendall, K.W. (2004). A question of fit: The links among environment, strategy formulation and performance. *Journal of Business and Management*, 10(1): 15-38.
- Hart, S. and Banbury, C. (1994). How strategy-making processes can make a difference. *Strategic Management Journal*, 15(4): 251-269.
- Hart, S. L. (1992). An integrative framework for strategy-making processes. *Academy of Management Review*, 17(2): 327-351.
- Hatch, M.J. (1997). Jazzing up the theory of organizational improvisation. *Advances in Strategic Management*, 14(2): 181-191.

References

- Hatch, M.J. (1999). Exploring the empty spaces of organizing: How improvisational jazz helps redescribe organizational structure. *Organization Studies*, 20(1): 75-100.
- Hatch, M.J. and Weick, K.E. (1998). Critical resistance to the jazz metaphor. *Organization Science*, 9(5): 600-604.
- Hax, A.C. (1990). Redefining the Concept of Strategy and the Strategy Formation Process. *Planning Review*, 18(3): 34-40.
- Hendry, J. (2000). Strategic decision making, discourse, and strategy as social practice. *Journal of Management Studies*, 37(7): 955-977.
- Hill, C.R. and Hughes, J.N. (2005). An Examination of the Convergent and Discriminant Validity of the Strengths and Difficulties Questionnaire. *School Psychology Q.*, 22(3): 380-406.
- Hitt, M.A., Ireland, R.D. and Hoskisson, R.E. (2005). *Strategic management competitiveness and globalization concepts*. 6th Ed., Ohio: Thomson South-Western.
- Hmieleski, K.M. and Corbett, A.C. (2006). Proclivity for improvisation as a predictor of entrepreneurial intentions. *Journal of Small Business Management*, 44(1): 45-63.
- Hmieleski, K.M. and Corbett, A.C. (2008). The contrasting interaction effects of improvisational behaviour with entrepreneurial self-efficacy on new venture performance and entrepreneur work satisfaction. *Journal of Business Venturing*, 23(4): 482-496.
- Hmieleski, K.M. and Ensley, M.D. (2004). An investigation of improvisation as a strategy for exploiting dynamic opportunities. In W. D. Bygrave *et al.* (Eds.), *Frontiers of Entrepreneurship Research*. Babson Park, MA: Babson College.
- Hofer, C.W. (1975). Toward a contingency theory of business strategy. *The Academy of Management Journal*, 18(4): 784-810.
- Hofstede, G. (1984). *Culture's consequences: International differences in work-related values*. Newbury Park, CA: Sage.

References

- Hong, P. Nahm, A.Y. and Doll, W.J. (2004). The role of project target clarity in an uncertain project environment. *International Journal of Operation and Production Management*, 24(12): 1269-1291.
- Hough, J.R. and Ogilvie, D. (2005). An empirical test of cognitive style and strategic decision outcomes. *Journal of Management Studies*, 42(2): 417-448.
- Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science*, 2(1): 88-115.
- Hughes, P. and Morgan, R.E. (2007). Deconstructing the relationship between entrepreneurial orientation and business performance at the embryonic stage of firm growth. *Industrial Marketing Management*, 36(5): 651-661.
- Hughes, P. and Morgan, R.E. (2008). Fitting strategic resources with product-market strategy: Performance implications. *Journal of Business Research*, 61(4): 323-331.
- Hult, G.T., Hurley, R.F. and Knight, G.A. (2004). Innovativeness: Its antecedent and effect on business performance. *Industrial Marketing Management*, 33(5): 429-438.
- Hutchins, E. (1991). Organizing work by adaptation. *Organization Science*, 2(1): 14-39.
- Hutt, M. D., Reingen, P. H. and Ronchetto, J. R., Jr. (1988). Tracing emergent processes in marketing strategy formation. *Journal of Marketing*, 52(January): 4-19.

I

- Iaquinto, A.L. and Fredrickson, J.W. (1997). Top management team agreement about the strategic decision process: A test of some of its determinants and consequences. *Strategic Management Journal*, 18(1): 63-75.

J

- Jambekar, A. and Pelc, K. (2007). Improvisation model for team performance enhancement in a manufacturing environment. *Team Performance Management*, 13(7/8): 259-274.
- Janis, I. (1982). *Groupthink: Psychological Studies of Policy Decisions and Fiascoes*. Boston, MA: Houghton Mifflin.

References

- Jaworski, B. J. and Kohli, A. K. (1993). Market Orientation: Antecedents and Consequences. *Journal of Marketing*, 57(July): 53-70.
- Jayachandran, S. and Varadarajan, R. (2006). Does success diminish competitive responsiveness? Reconciling conflicting perspectives. *Journal of the Academy of Marketing Science*, 34(3): 284-294.
- Jennings, D.F. and Seaman, S.L. (1994). High and low levels of organizational adaptation: An empirical analysis of strategy, structure, and performance. *Strategic Management Journal*, 15(6): 459-475.
- John, J., Grove, S.J. and Fisk, R.P. (2006). Improvisation in service performances: lessons from jazz. *Managing Service Quality*, 16(3): 247-268.
- Jolliffe, I.T. (2002). *Principal Component Analysis*. 2nd Ed., New York: Springer.
- Jones, M. (1997). Getting creativity back into corporate decision making. *The Journal for Quality and Participation*, 20(1): 58-62.
- Jones, R.A., Rafferty, A.E. and Griffin, M.A. (2006). The executive coaching trend: Towards more flexible executives. *Leadership & Organization Development Journal*, 27(7): 584-596.
- Jones-Evans, D. and Westhead, P. (1996). The high technology small firm sector in the UK. *International Journal of Entrepreneurial Behavior and Research*, 2(1): 15-35.

K

- Kalafsky, R.V. (2004). Export activity and firm size: An examination of machine tool sector. *Journal of Small Business and Enterprise Development*, 11(2): 159-165.
- Kamoche, K. and Cunha, M.P. (1997). Teamwork, knowledge-creation and improvisation. *Proceedings from the International workshop on team working*, UK (University of Nottingham): 358-374.
- Kamoche, K. and Cunha, M.P. (1998). From jazz improvisation to product innovation. In Kamoche, K. Cunha, M.P. and Cunha, J.V. (2002). *Organizational Improvisation*. London: Routledge.
- Kamoche, K., and Cunha, M.P. (2001). Minimal structures: From jazz improvisation to product innovation. *Organization Studies*, 22(5): 733-764.

References

- Kamoche, K., Cunha, M.P. and Cunha, J.V. (2002). *Organizational Improvisation*. London: Routledge.
- Kamoche, K., Cunha, M.P. and Cunha, J.V. (2003). Towards a theory of organizational improvisation: Looking beyond jazz metaphor. *Journal of Management Studies*, 40(8): 2023-2051.
- Kanter, R.M. (2002). Strategy as improvisational theater. *Sloan Management Review*, 43(2): 76–81.
- Karger, D.W and Malik, Z.A (1975). Long range planning and organizational performance. *Long Range Planning*, 8(4): 60-64.
- Ken G. S., Curtis M. G., Martin J. G. and Ming-Jer C. (1991). Organisational information processing, competitive responses and performance in the U.S. Domestic Airline Industry. *The Academy of Management Journal*, 34(1): 60-85.
- Keller, R.T. (1994). Technology-information processing fit and the performance of R&D project groups: A test of contingency theory, *Academy of Management Journal*, 37(1): 167-179.
- Kessler, E.H. and Chakrabarti, A.K. (1996). Innovation speed: A conceptual model of context, antecedents, and outcomes. *The Academy of Management Review*, 21(4): 1143-1191.
- Ketchen, D.J. Ireland, R.D. and Snow, C.C. (2007). Strategic entrepreneurship, collaborative innovation, and wealth creation. *Strategic Entrepreneurship Journal*, 1(34): 371-385.
- Klein, G. (2003). *Intuition at work*. New York: Currency Doubleday.
- Knight, D., Durham, C.C., Locke, E.A. (2001). A relationship of team goals, incentives, and efficacy to strategic risk, tactical implementation, and performance. *The Academy of Management Journal*, 44(2): 326-338.
- Knight, K.E. and Mc Daniel, R.R. (1979). *Organizations: An Information Systems Perspective*. Belmont, CA: Wadworth Publishing Co.

References

- Kohli, A. (1989). Determinants of influence in organizational buying: A contingency approach. *Journal of Marketing*, 53(July): 50-65.
- Kohli, A. K. and Jaworski, B. J. (1990). Market Orientation: The construct, research propositions and management implications. *Journal of Marketing*, 32(April): 1-18.
- Kolarcik, P., Geckova, A.M., Orosova, O., Dijk, J.P. and Reijneveld, S.A. (2009). To what extent does socioeconomic status explain differences in health between Roma and non-Roma adolescents in Slovakia? *Social Science and Medicine*, 68 (7): 1279-1284.
- Konsynski, B and Tiwana, A. (2004). The improvisation-efficiency paradox in inter-firm electronic networks: governance and architecture considerations. *Journal of Information Technology*, 19(4): 234-247.
- Krohmer, H., Homburg, C. and Workman, J. P. (2002). Should marketing be cross-functional? Conceptual development and international empirical evidence. *Journal of Business Research*, 55(6): 451-465.
- Kyriakopoulos, K. and Moorman, C. (2004). Tradeoffs in marketing exploitation and exploration strategies: The overlooked role of market orientation. *International Journal of Research in Marketing*, 21(3): 219-240.
- Kyriakopoulos, K. (2004). Improvisation in new product development: The contingent role of memory and information flows. *The Fifth European Conference on Organizational Knowledge, Learning, and Capabilities*. Session C-2:1-9. Available at:<http://www2.warwick.ac.uk/fac/soc/wbs/conf/olkc/archive/oklc5/papers/>

L

- Lant, T. K., Milliken, F. J. and Batra, B. (1992). The role of managerial learning and interpretation in strategic persistence and reorientation: An empirical exploration. *Strategic Management Journal*, 13(8): 585-608.

References

- Leaptrott, J. (2006). The dual process model of reasoning and entrepreneurial decision making: A field study of new childcare ventures. *The Journal of Applied Management and Entrepreneurship*, 11(2): 17-31.
- LeClaire, J. (2008). *Malaysia: State-of-the-Art Tech Efficiencies*. Available at: <http://www.areadevelopment.com/InternationalLocationReports/oct08/Malaysia-tech-efficiencies.shtml>
- Leybourne, S. and Sadler-Smith, E. (2006). The role of intuition and improvisation in project management. *International Journal of Project Management*, 24(6): 483-492.
- Leybourne, S.A. (2006). Managing change by abandoning planning and embracing improvisation. *Journal of General Management*, 31(3): 11-29.
- Liao, Y.S. (2005). Business strategy and performance: The role of human resource management control. *Personal Review*, 34(3): 294-305.
- Lindblom, C.E. (1968). *The policy making process*. Englewood Cliffs, NJ: Prentice Hall.
- Lynch, R. (2003). *Corporate Strategy*. 3rd Ed., Harlow: Prentice-Hall.

M

- MacCrimmon K.R. and Wehrung, D.A. (1990). Characteristics of risk taking executives. *Management Science*, 36(4): 422-435.
- MacKenzie, S.B., Podsakoff, P.M., Ahearne, M. (1998). Some possible antecedents and consequences of in-role and extra-role salesperson performance. *Journal of Marketing*, 62(3): 87-97.
- Magni, M., Proserpio, L., Hoegl, M. and Provera, B. (2009). The role of team behavioural integration and cohesion in shaping individual improvisation. *Research Policy*, 38(6): 1044-1053.
- Malaysia Budget (1999). *The 1999 Budget Speech*. Available at: <http://www.mir.com.my/lb/budget99/img/budgetspeech.pdf>
- Malaysia Budget (2006). *The 2006 Budget Speech*. Available at: <http://www.hasil.gov.my/lhdnv3e/documents/budget/BudgetSpeech2006.pdf>

References

- Malaysia Budget (2010). *The 2010 Budget Speech*. Available at :
<http://www.lawnet.com.my/lawnetpublic/2010BudgetSpeech.pdf>
- Malhotra, D. and Birks, L. (2006). *Marketing Research: An Applied Approach*. 3rd Ed., London: Prentice Hall.
- Mankins, M.C. and Steele, R. (2006). Stop making plans start making decisions. *Harvard Business Review*, 84(1): 76-87.
- March, J. G. (1978). Bounded rationality, ambiguity, and the engineering of choice. *Bell Journal of Economics*, 9(2): 587–608.
- March, J. G., and Simon. H.A. (1958). *Organizations*. New York: Wiley.
- March, J.G. (1981). Footnotes to organizational change. *Administrative Science Quarterly*, 26(4): 563-577.
- March, J.G. and Shapira, Z. (1987). Managerial perspectives on risk and risk taking. *Management Science*, 33(11): 1404-1418.
- Markoczy, L. (2001). Consensus formation during strategic change, *Strategic Management Journal*, 22(11): 1013–1031.
- Mason, R.B. (2007). The external environment's effect on management and strategy: A complexity theory approach. *Management Decision*, 45(1): 10-28.
- MASTIC (Malaysia Science and Technology Information Centre), (2008). *Malaysia's S&T Policy in the 21st Century*. Available at
<http://www.m0osti.gov.my/mosti/images/pdf/dstn2bi.pdf>.
- Mat Zin, R. and Talet, N. (2007). Managing resources towards achieving Malaysian Vision 2020: Policies, Prospects and Challenges. *The Business Review, Cambridge*, 9(1): 198-202.
- McDonough III, E.F. (2000). Investigation of factors contributing to the success of cross-functional teams. *Journal of Product Innovation Management*, 17(3): 221-235.
- McGahan, A.M. and Porter, M.E. (1997). How much does industry matter, really? *Strategic Management Journal*, (Summer Special Issue): 15-30.
- McGrath, M. (2001). *Product Strategy for High Technology Companies*. New York: McGraw Hill.

References

- McKenzie, L. (1992). Critical thinking in health care supervision. *The Health Care Supervisor*, 10(4): 1-11.
- McKibbin, K. A., Fridsma, D.B. and Crowley, S. (2007). How primary care physicians' attitudes towards risk and uncertainty affect use of electronic information resource. *Journal of the Medical Library Association*, 95(2): 138-146.
- McKnight, B. and Bontis, N. (2002). E-improvisation: collaborative groupware technology expands the reach and effectiveness of organizational improvisation. *Knowledge & Process Management*, 9(4): 219-227.
- Mendonca, S., Cunha, M.P., Kaivo-oja, J. and Ruff, F. (2004). Wild cards, weak signals and organizational improvisation. *Futures*, 36(2): 201-218.
- Menon, A., Bharadwaj, S.G., Adidam, P.T., and Edison, S.W. (1999). Antecedents and consequences of marketing strategy making: A model and a test. *Journal of Marketing*, 63(2): 18-40.
- Menon, A., Sundar, G. B. and Roy, D.H. (1996). The quality and effectiveness of marketing strategy: Effect of functional and dysfunctional conflict in intraorganizational relationships. *Journal of Academy of Marketing Sciences*, 24(Fall): 299-313.
- Meyer, A.D. (1991). What is strategy's distinctive competence? *Journal of Management*, 17(4): 821-833.
- Meyer, P. (2005). *Organizational Improvisation and Appreciative Inquiry*. CA: Fielding Graduate University.
- Meyers, L.S., Gamst, G. and Guarino, A.J. (2006). *Applied Multivariate Research: Design and Interpretation*. United Kingdom: Sage Publications, Inc.
- Miles, R.E., Snow, C.C., Meyer, A.D. and Coleman, H.J. (1978). Organizational strategy, structure and process. *The Academy of Management Review*, 3(3): 546-562.
- Miller, D. (1988). Relating Porter business strategies to environment and structure: Analysis and performance implications. *The Academy of Management Journal*, 31(2): 280-308.
- Miller, D. (1991). Stale in the Saddle: CEO tenure and the match between organization and environment. *Management Science*, 37(1): 34-52.

References

- Miller, S. (2000), *Experimental Design and Statistics*. 2nd Ed., East Sussex: Brunner-Routledge.
- Miller, S. J., Wilson, D. C. and Hickson, D. J. (2004). Beyond planning: Strategies for successfully implementing strategic decisions. *Long Range Planning*, 37(3): 201-218.
- Millson, M.R., Raj, S.P. and Wilemon, D. (1992). A survey of major approaches for accelerating new product development. *Journal of Product Innovation Management*, 9(1): 53-69.
- Mintzberg, H. (1973). Strategy-making in three modes. *California Management Review*, 16(2): 44-53.
- Mintzberg, H. (1978). Patterns in strategy formation. *Management Science*, 24(9): 934-948.
- Mintzberg, H. (1979). *The Structuring of Organizations*. Englewood Cliffs, NJ: Prentice-Hall.
- Mintzberg, H. (1987). The strategy concept I: Five Ps for strategy. *California Management Review*, 30(1): 11-24.
- Mintzberg, H. (1990). The design school: Reconsidering the basic premises of strategic management. *Strategic Management Journal*, 11(3): 171-195.
- Mintzberg, H. (1994). *Rise and Fall of Strategic Planning*. New York, NY: The Free Press.
- Mintzberg, H. and Lampel, J. (1999). Reflecting on the strategy process. *Sloan Management Review*, 40(Spring): 21-30.
- Mintzberg, H. and McHugh, A. (1985). Strategy formation in an adhocracy. *Administrative Science Quarterly*, 30(2): 160-197.
- Mintzberg, H. and Waters, J. (1985). Of strategies, deliberate and emergent. *Strategic Management Journal*, 6(3): 257-272.
- Mintzberg, H., Ahlstrand, B. and Lampel, J. (1998). *Strategy Safari*. Englewood Cliffs, NJ: Prentice-Hall.
- Mintzberg, H., Raisinghani, D. and Theoret, A. (1976). The structure of 'unstructured' decision processes. *Administrative Science Quarterly*, 21(2): 246-275.

References

- Mitchell, T. R. and James, L. R. (2001). Building better theory: Time and the specification of when things happen. *Academy of Management Review*, 26(4): 530-547.
- Mobey, A. and Parker, D. (2002). Risk evaluation and its importance to project implementation. *Work Study*, 51(4): 202-206.
- Mohan, A.V. (2006). *The entrepreneur development programme in Malaysia's MSC cluster: The technopreneur development flagship (MTD) programme*. Available at: http://www.unescap.org/tid/projects/sis_s2mohan.pdf
- Montgomery, C. A., Wernerfelt, B. and Balakrishnan, S. (1989). Strategy content and the research process: A critique and commentary. *Strategic Management Journal*, 10(2): 189-197.
- Montgomery, D.B., Moore, M.C., and Urbany, J.E. (2005). Reasoning about competitive reactions: Evidence from executives. *Marketing Science*, 24(1): 138-149.
- Moorman, C. and Miner, A.S. (1995). *Walking the tightrope: Improvisation and information in new product development*. Cambridge, MA: Marketing Science Institute.
- Moorman, C. and Miner, A.S. (1997). The impact of organizational memory on new product performance and creativity. *Journal of Marketing Research*, 34(2): 91-106.
- Moorman, C. and Miner, A.S. (1998a). Organizational improvisation and organizational memory. *The Academy of Management Review*, 23(4): 698-723.
- Moorman, C. and Miner, A.S. (1998b). The convergence between planning and execution: Improvisation in new product development. *Journal of Marketing*, 62(3): 1-20.
- Morgan, N. A., Vorhies, D. W. and Yarbrough, L. (2003). The impact of product-market strategy-organizational culture fit on business's customer satisfaction and financial performance. *Kenan-Flagler Business School Working Paper Series*, University of North Carolina, NC: Chapel Hill, NC.
- Morgan, R. E., McGuinness, T. and Thorpe, E. R. (2000). The contribution of marketing to business strategy formation: A perspective on business performance gains. *Journal of Strategic Marketing*, 8(4): 341-362.

References

- Morgan, R.E. and Strong, C.A. (2003). Business performance and dimensions of strategic orientation. *Journal of Business Research*, 56(3): 163-176.
- Murdock, P.M. 2007. (2006). *Fast-Tech Report Card*. Available at: <http://www.forbes.com>.
- Murmann, P. (1994). Expected development time reductions in the German mechanical engineering industry. *Journal of Product Innovation Management*, 11(3): 236-252.
- Myers, M.D. (1997). Interpretive research in information system. In Mingers, J and Stowell, F.A. *Information System: An emerging discipline?* London: McGraw-Hill.
-
- N
-
- Nadler, D.A. (1981). Managing Organizational Change: An Integrative Perspective. *The Journal of Applied Behavioral Science*, 17(2): 191-211.
- Narver J.C. and Slater S.F. (1990). The effect of a market orientation on business profitability. *Journal of Marketing*, 54(4): 20-35.
- National SMR Development Council (2005). *Definitions for Small and Medium Enterprises in Malaysia*. Bank Negara Malaysia. Available at: http://www.smeinfo.com.my/pdf/sme_definitions_ENGLISH.pdf
- Neill, S. and Rose, G.M. (2006). The effect of strategic complexity on marketing strategy and organizational performance. *Journal of Business Research*, 59(1): 1-10.
- Neuman, W.L. (2006). *Social Research Methods: Qualitative and Quantitative Approaches*. 6th Ed., Boston: Pearson Education, Inc.
- Nicoll, N.H. and Beyea, S.C. (1999). Using secondary data analysis for nursing research. *AORN Journal*, 69(2): 428-433
- Ninth Malaysia Plan, (2006-2010). Available: <http://www.epu.jpm.my/rm9/html/english.htm>.
- Noble, C. H. and Mokwa, M. P. (1999). Implementing marketing strategies: Developing and testing a managerial theory. *Journal of Marketing*, 63(October): 57-73.
- Nunnally, J.C. (1978). *Psychometric Theory*. New York: McGraw-Hill.

References

O

- O'Regan, N. and Ghobadian, A. (2004). The importance of capabilities for strategic direction and performance. *Management Decision*, 42(2): 292-313.
- Ohmae, K. (1982). *The mind of the strategist*. NY: McGraw-Hill.
- Oliver, C. (1991). Strategic responses to institutional processes. *The Academy of Management Review*, 16(1): 145-179
- O'Regan, N. and Ghobadian, A. (2002). Formal strategic planning: The key to effective business process management? *Business Process Management*, 8(5): 416-429.
- Orlikowski, W.J. (1996). Improvising organizational transformation over time: A situated change perspective. *Information System Research*, 7(1): 63-92.
- Orlikowski, W.J. and Baroudi, J.J. (1991). Studying information technology in organizations: Research approaches and assumptions. *Information System Research*, 2(1): 1-28.
- Osborne, J. and Waters E. (2002). Four assumptions of multiple regression that researchers should always test. *Practical Assessment, Research & Evaluation*, 8(2). Available at: <http://PAREonline.net/getvn.asp?v=8&n=2> .
- Osborne, Jason & Elaine Waters (2002). Four assumptions of multiple regression that researchers should always test. *Practical Assessment, Research & Evaluation*, 8(2). Available at <http://PAREonline.net/getvn.asp?v=8&n=2> .
- Othman, N.H. (2009). Public-private collaboration in research and development in Malaysia. *Tech Monitor*, (September-October): 19-23. Available at http://www.techmonitor.net/techmon/09sep_oct/tm/pdf/09sep_oct_sf2.pdf.
- Ottesen, G.G. and Grønhaug, K. (2004). Exploring the dynamics market orientation in turbulent environments: A case study. *European Journal of Marketing*, 38(8): 956-973.
- Ottesen, G.G., Grønhaug, K. (2002). Market orientation and uncertain supply in upstream markets: An exploratory study. *European Journal of Purchasing and Supply Management*, 8(4): 209-219.

References

P

- Pallant, J. (2007). *SPSS Survival Manual*. 3rd Ed., New York: McGraw-Hill.
- Palmer, T.B. and Wiseman, R.M. (1999). Decoupling risk taking from income stream uncertainty: A holistic model of risk. *Strategic Management Journal*, 20(11): 1037-1062.
- Papadakis, V.M. and Barwise, P. (2002). How much do CEOs and top managers matter in strategic decision-making? *British Journal of Management*, 13(1): 83-95.
- Parker-Pope, T. (1999). Stopping diaper leaks can be a nasty business, P&G shows its rivals. *Wall Street Journal*, 1(April 8).
- Pasmore, W.A. (1998). Organizing for jazz. *Organization Science*, 9(5): 562-568.
- Pearce, J.A., Freeman, D.K. and Robinson, R.B. (1987a). The tenuous link between formal strategic planning and financial performance. *Academy of Management review*, 12(4): 658-675.
- Pearce, J.A., Robins, D.K. and Robinson, R.B. (1987b). The impact of grand strategy and planning formality on financial performance. *Strategic Management Journal*, 8(2): 125-134.
- Pedhazur, E. J., and Schmelkin, L. P. (1991). *Measurement, design, and analysis: An integrated approach*. Hillsdale, New Jersey: Erlbaum.
- Pentland, B.T. and Feldman M.S. (2005). Organizational routines as a unit of analysis. *Industrial and Corporate Change*, 14(5): 793-815.
- Pentland, B.T. and Feldman, M.S. (2008). Designing routines: On the folly of designing artefacts, while hoping for patterns of action. *Information and Organizations*, 18(4): 235-250.
- Perry, L.T. (1991). Strategic improvisation: How to formulate and implement competitive strategies in concert. *Organizational Dynamics*, 19(4): 51-64.
- Phau, I. and Ong, D. (2007). An investigation of the effects of environmental claims in promotional messages for clothing brands. *Marketing Intelligence & Planning*, 25(7): 772-788.

References

- Piercy, N. F. (1998). Marketing implementation: The implications of marketing paradigm weakness for the strategy execution process. *Journal of the Academy of Marketing Science*, 26(3): 222-236.
- Piercy, N.F. and Morgan, N.A. (1994). The marketing planning process: Behavioral problems compared to analytical techniques in explaining marketing plan credibility. *Journal of Business Research*, 29(3): 167-178.
- Plant, T. (2006). Public sector strategic planning: An emergent approach. *Performance Improvement*, 45(5): 5-6.
- Podsakoff, P.M. and Organ, D.W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12(4): 531-544.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y. and Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5): 879–903.
- Porter, M. E. (1980). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York, NY: The Free Press.
- Prabhu, J. and Stewart, D. W. (2001). Signaling strategies in competitive interactions: Building reputations and hiding the truth. *Journal of Marketing Research*, 38(1): 62-72.
- Prahalad, C. K. and Hamel, G. (1994). Strategy as a field of study: Why search for a new paradigm? *Strategic Management Journal*, 15(Special Issue): 5-16.

Q

- Quarterly, T.M. 2006. *A McKinsey Survey: Improving strategic planning*: 1-11.

R

- Rajan, R., Zingales, L. and Kumar, K. (2001). What determines firm size? *CRSP Working Paper No. 496; and USC Finance & Business Economy Working Paper*. Available at SSRN: <http://ssrn.com/abstract=170349> or DOI: 10.2139/ssrn.170349
- Raudsepp, E. (1990). Are you flexible enough to succeed? *Manage*, 42(2): 6-10.

References

- Reading, C. (2002). *Strategic business planning: A dynamic system for improving performance and competitive advantage*. 2nd Ed., London: Kogan Page.
- Rennie, K.M. (1997). Exploratory and confirmatory rotation strategies in exploratory factor analysis. *Annual Meeting of the Southwest Educational Research Association*. Available at: <http://ericae.net/ft/tamu/rota.htm>
- Rexroad, R.A (1983). *High Technology Marketing Management*. New York: Ronald Press.
- Reynolds, N.L., Diamantopoulos, A. and Schlegelmilch, B. (1993). Pretesting in questionnaire design: A review of the literature and suggestions for further research. *Journal of the Market Research Society*, 35(2): 171-182.
- Riggs, H.E (1983). *Managing High Technology Companies*. Belmont, CA: Lifetime Learning Publication .
- Robbins. S. (2005). *Organizational Behavior*. 11th Ed., Upper Saddle River, NJ: Prentice Hall.
- Robinson R. and Pearce, J. (1983). The impact of formalized strategic planning on financial performance in small organizations. *Strategic Management Journal*, 4(3): 197-207.
- Robinson, R. Jr. (1992). The importance of outsiders in small firm strategic planning. *Academy of Management Journal*, 25(1): 76-88.
- Rofers, P. and Blenko, M. (2006). Who has the D? How clear decision roles enhance organizational performance. *Harvard Business Review*, 84(1): 52-61.
- Rogers, P.R., Miller, A., and Judge, W.Q. (1999). Using information-processing theory to understand planning/performance relationships in the context of strategy. *Strategic Management Journal*, 20(6): 567-577.
- Rosenberg, M. (1999). Improvisation promotes innovative thinking, company flexibility. *Canadian HR Reporter, Toronto*, 12(10): G9-G10.
- Roth, K. (1992). Implementing international strategy at the business unit level: The role of managerial decision-making characteristics. *Journal of Management*, 18(4): 769-789.
- Roy, A. (2008). Organization structure and risk taking in banking. *Risk Management*, 10(2): 122-134.

References

Ruekert, R.W., Walker, O.C. and Roering K.J. (1985). The organization of marketing activities: A contingency theory of structure and performance. *Journal of Marketing*, 49(Winter): 13-25.

S

Samili, A.C., Wills, J. (1986). Strategies for marketing computers and related products. *Industrial Marketing Management*, 15(February): 23-32.

Saunders, A., Strock, E. and Travlos, N.G. (1990). Ownership structure, deregulation, and bank risk taking. *The Journal of Finance*, 45(2): 643-654.

Scribner, S. (1984). Studying working intelligence. In Rogoff, B., Lave, J. (Eds), *Everyday Cognition: Its Development in Social Context*. Cambridge, MA: Harvard University Press.

Sekaran, U. (1992). *Research Methods for Business*. 2nd Ed., New York: Wiley.

Shimizu, K. and Hitt, M.A. (2004). Strategic flexibility: Organizational preparedness to reverse ineffective strategic decision. *Academy of Management Executive*, 18(4): 44-59.

Shoham, A., Rose, G.M. and Kropp, F. (2005). Market orientation and performance: A meta-analysis. *Market Intelligence and Planning*, 23(5): 435-454.

Simon, H. A. (1958). The decision-making scheme: A reply. *Public Administration Review*, 18: 60-63.

Simon, H. A. (1976), *Administrative Behavior*, 3rd Ed., New York, NY: The Free Press.

Simon, H. A. (1993). Strategy and organizational evolution. *Strategic Management Journal*, 14(S2): 131-142.

Singh J.V. (1986). Performance, slack, and risk taking in organizational decision making. *Academy of Management Journal*, 29(3): 562-585.

Sinkula, J. M. (1994). Market Information Processing and Organizational Learning. *Journal of Marketing*, 58(January): 35-45.

Slater, S.F. and Narver, J.C. (1994). Does competitive environment moderate the market orientation-performance relationship? *Journal of Marketing*, 58(January): 46-55.

References

- Slater, S.F., Olson, E.M., and Hult, G.T.M. (2006). The moderating influence of strategic orientation on the strategy formation capability-performance relationship. *Strategic Management Journal*, 27(12): 1221-1231.
- Slevin, D. P. and Covin, J. G. (1997). Strategy formation patterns, performance and the significance of context. *Journal of Management*, 23(2):189-209.
- Slotegraaf, R.J. and Dickson, P.R. (2004). The paradox of a marketing planning capability. *Journal of the Academy of Marketing Science*, 32(4): 371-385.
- Soberman, D. and Gatignon, H. (2005). Research issues at the boundary of competitive dynamics and market evolution. *Marketing Science*, 24(1): 165-174.
- Souchon, A.L. and Hughes, P. (2007). Improvising export decisions: A contingency theory perspective. *International and Cross-cultural Marketing*, Track 8.
- Stacey, R. (1993). Strategy as order emerging from chaos. *Long Range Planning*, 26(1): 10-17.
- Stake, R. E. (1995). *The Art of Case Study Research*. Thousand Oaks, CA: Sage.
- Steven J. (1996). *Applied Multivariate Statistics for the Social Sciences*. 3rd Ed., New Jersey: Lawrence Erlbaum.
- Stevens, S.S. (1946). On the theory of scales of measurement. *Science*, 103(2684): 677-680.
- Sudman, S. and Bradburn, N. M. (1982). *Asking Questions: A Practical Guide to Questionnaire Design*. San Francisco, CA: Jossey-Bass.

T

- Tabachnick, B.G. and Fidell, L.S. (2001). *Using Multivariate Statistics*. 4th Ed., MA: Allyn & Bacon.
- Tetrick, L.E. in Stellman, J.M. (1998). *Encyclopaedia of occupational health and safety*. 4th Ed., Vol.2. Geneva: International Labour Office.
- Thompson A.A. and Strickland, A.J. (2004). *Strategic Management: Concepts and cases*. 13th Ed., New York: McGraw-Hill.
- Thompson, J.D. (1967). *Organizations in Action*. New York: McGraw-Hill.

References

- Thune, S., and House, R. (1970). Where LongRange planning pays off. *Business Horizons*, 13(4): 81-87.
- Thwaites, D. and Glaister, K. (1992). Strategic responses to environmental turbulence. *International Journal of Bank Marketing*, 10(3): 33-40.
- Tierney, P., Farmer, S.M. and Graen, G.B. (1999). An examination of leadership and employees creativity: The relevance of traits and relationships. *Personnel Psychology*, 52(3): 591-619.
- Tomaskovic-Devey, T., Leiter, J. and Thompson, S. (1994). Organizational survey nonresponse. *Administrative Science*, 39(3): 439-457
- Travis, J. (1999). Exploring the constructs of evaluative criteria for interpretivist research. *Proceeding 10th Australiasian Conference on Information Systems*: 1037-1049.
- Traynor, K. and Traynor, S. (2004). A comparison of marketing approaches used by high-tech firms: 1985 versus 2001. *Industrial Marketing Management*, 33(5): 457-461.
- Trow, D. B. (1961). Executive succession in small companies. *Administrative Science Quarterly*, 6(2): 12-15.
- Truman, P. (1996). Intuitively yours? *Management Services*, 40(10): 16-17.
- Tsoukas, H. and Shepherd, J. (2004). Coping with the Future: Developing Organizational Foresightfulness. *Futures*, 36(2): 137-144.
- Tull, D. and Hawkins, D. (1993). *Marketing Research: Measurement and Method*. 6th Ed., New York: Macmillan Publishing Company.
- Tushman, M., Anderson, P. (1986). Technological discontinuities and organizational environments. *Administrative Science Quarterly*, 31(3): 439-465.

U

- Urbany, J.E. and Montgomery, D.B. (1998). Rational strategic reasoning: An unnatural act? *Marketing Letters*, 9(3): 285-299.

V

References

- Varadarajan, P. R. and Jayachandran, S. (1999). Marketing strategy: An assessment of the state of the field and outlook. *Journal of the Academy of Marketing Science*, 27(2): 120-143.
- Venkatraman, N. and Ramanujam, V. (1986). Measurement of business performance in strategy research: A comparison of approaches. *Academy of Management Review*, 11(4): 801-814.
- Vera, D. and Crossan, M. (2004). Theatrical improvisation: Lessons for organizations. *Organization Studies*, Sage Publications. Available at <http://oss.sagepub.com>.
- Vera, D. and Crossan, M. (2005). Improvisation and innovative performance in teams. *Organization Science*, 16(3): 203-224.
- Vera, D. and Rodriguez-Lopez, A. (2007). Leading improvisation: Lessons from the American Revolution. *Organizational Dynamics*, 36(3): 303-319.
- Verdú-Jover, A.J., Gómez-Gras, J. and Lloréns-Montes, F.J. (2008). Exploring managerial flexibility: Determinants and performance implications. *Industrial Management & Data Systems*, 108(1): 70-86.

W

- Walsh J.P. and Seward J.K. (1990). On the efficiency of internal and external corporate control mechanisms. *Academy of Management Review* 15(3): 421-458
- Webb, G and Chevreau, F (2006). Planning to improvise: The importance of creativity and flexibility in crisis response. *International Journal of Emergency Management*, 3(1): 66-72.
- Webber, M., Morgan, and M., Dickson, R. (1999). The effect of improvisation on decision-making in a volatile environment. *Journal of Organizational Leadership*, 1(1): 46-59.
- Weick, K.E. (1993). The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Science Quarterly*, 38(4): 628-652.
- Weick, K.E. (1995). *Sensemaking in Organizations*. Thousand Oaks, CA: Sage.
- Weick, K.E. (1998). Improvisation as a mindset for organizational analysis. *Organization Science*, 9(5): 543 – 555.

References

- Weick, K.E. (1999). Conclusion: Theory construction as disciplined reflexivity: Tradeoffs in the 90s. *The Academy of Management Review*, 24(4): 797-806.
- Weick, K. E. (2001). Substitutes for strategy. *Making sense of the organization*: 345-355. Malden, MA: Blackwell.
- Weston, J. (2010). *AirAsia Announce Free Flights & Thai Bourse Expansion*. Available at: <http://www.pattayadailynews.com/en/2010/05/27/airasia-announces-free-flights-ambitious-bourse-expansion/>
- Wheelen, T.L. and Hunger, J.D. (2010). *Strategic Management and Business Policy*. 12th Ed., New Jersey: Prentice Hall.
- Whittington, R. (1996). Strategy as practice. *LongRange Plan*, 29(5): 731-735.
- Wight, C. (2006). Realism, science and emancipation. In Dean K., Joseph, J. Robert, J.M. and Wright, C. *Realism, Philosophy and Social Science*. New York: Palgrave.
- Williamson, O. (1975). *Markets and Hierarchies*. New York, NY: The Free Press.

Y

- Yang, W. and Lynch, B.P. (2006). On knowledge management and the role of the library in the process of knowledge management Chinese Librarianship. *An International Electronic Journal*, 2(June). Available at: <http://www.iclc.us/cliej/cl21YangLynch.htm>
- Yin, R. K. (1994). *Case Study Research: Design and Methods*. 2nd Ed., Thousand Oaks, CA: Sage.

Z

- Zahra, S.A., Neubaum, D.O., and Huse, M. (1997). The effect of the environment on export performance among telecommunications new ventures. *Entrepreneurship Theory and Practice*, 22(1): 25-46.
- Zimmerman, B.J. (1995). Enhancing intuitive reasoning: A case for higher cognitive processes. *Learning and Individual Differences*, 7(2): 115-117.

Appendices

APPENDIX 1

BusinessSchool

LoughboroughUniversity Leicestershire LE11 3TU UK
Swithboard: +44 (0)1509 263171



Mr. Lim Choon Leng
Chief Technology Officer
Agbio Tech Sdn. Bhd.
352 Jalan Kota Kenari 4
Kota Kenari, 09000 Kulim
Kedah

26 May 2008

Dear Mr Lim Choon Leng,

RESEARCH ON ORGANISATIONAL IMPROVISATION AND FIRM PERFORMANCE

A few days from now you will receive in the mail a request to fill out a questionnaire for an important research project that examine the effect of strategic reasoning in managers' decision-making and firm performance as well as the firm improvisational practices in the process of strategic perspectives.

I am writing in advance because we have found many people like to know ahead of time that they will be contacted. This study is significantly important and it is believed that this information should be taken into account in the formation policies for the planning and development of technology-based firms in Malaysia. Addressing the specific context on management perspectives of technology-based companies in Malaysia, this significant contribution of the study is highly expected to achieve the success of the target in Ninth Malaysia Plan.

Thank you for your time and consideration. Your cooperation is highly appreciated.

Yours sincerely,

DARWINA ARSHAD
Doctoral Researcher
LoughboroughUniversity
United Kingdom

APPENDIX 2

BusinessSchool
LoughboroughUniversity Leicestershire LE11 3TU UK
Swithboard: +44 (0)1509 263171



Mr. Lim Choon Leng
Chief Technology Officer
Agbio Tech Sdn. Bhd.
352 Jalan Kota Kenari 4
Kota Kenari, 09000 Kulim
Kedah

30 May 2008

Dear Mr Lim Choon Leng,

RESEARCH ON IMPROVISATION, STRATEGIC REASONING AND FIRM PERFORMANCE

Referring to the above matter, I would like to obtain your invaluable response and support in affiliation with my study. I am a lecturer from University Utara Malaysia and am currently doing a PhD in strategic management in Loughborough University, UK.

As part of my PhD research, I am conducting a survey to examine the effect of strategic reasoning in managers' decision-making and firm performance as well as the firm improvisational practices in the process of strategic perspectives. I have undertaken this study because of the belief that these information should be taken into account in the formation policies for the planning and development of technology-based firms in Malaysia. Addressing the specific context on management perspectives of technology-based companies in Malaysia, this significant contribution of the study is highly expected to achieve the success of the target in Ninth Malaysia Plan.

Therefore, I would like to ask you to spend a small amount of your valuable time to complete the questionnaire which is enclosed with this letter. Completing the questionnaire would take no more than 15 minutes of your time. Your answers are very important to the accuracy of this study. The utmost confidentiality will be observed in using the information given. All responses you provide will be completely anonymous and this information will not be shared with anyone outside of the research team of myself and my supervisors.

When the study has been completed, a copy of the report can be made available to you. If you would like a copy, please provide your company name and address on the last page of the questionnaire.

Thank you for your assistance.

Yours sincerely,

DARWINA ARSHAD
Doctoral Researcher
LoughboroughUniversity
United Kingdom

APPENDIX 3

COVER FRONT PAGE OF THE QUESTIONNAIRE

BusinessSchool
LoughboroughUniversity Leicestershire LE11 3TU UK
Switchboards: +44 (0)1509 263171



ORGANISATIONAL IMPROVISATION AND COMPANY PERFORMANCE

June 2008

Dear Respondent,

Warm greetings! May we seek your help with our research project? The purpose of this study is to collect information on the factors influenced on company improvisation and company performance of technology-based companies in Malaysia. In completing this questionnaire, please consider it in relation to the single biggest **current project** pursued by your organization.

This survey will take about 10 to 15 minutes to complete.

Your help in completing and returning this survey is central to the success of this research project and would be highly appreciated! Please make each question a separate and independent judgment. Work at a fairly high speed through the questionnaire and do not worry or puzzle over individual items. There are no 'right' or 'wrong' answers to any of these questions. The questionnaire has been designed for you to be able to tick (✓) most of the items to enable you to complete the questionnaire in the shortest possible time. Your answers are very important to the accuracy of our study.

All responses to this survey will be kept confidential and secure. Results will be used only for academic purposes with no specific individuals identified.

Please return the completed questionnaire using the *self-addressed envelope enclosed* at your earliest possible convenience **or** please return and attach your completed questionnaires through my email address at bsda4@lboro.ac.uk

Thank you for your time and for sharing experiences.

Kind regards,
Darwina Arshad
Doctoral Researcher
Loughborough University, UK

Dr. Paul Hughes
Prof. Trevor Buck
PhD Supervisors,
Loughborough University, UK

☎ :013-4677907 (In Malaysia from 21st May to 12th August , 2008)
✉ : bsda4@lboro.ac.uk

			/				/	
The sequence number will be used for data validation purposes only								

COVER END PAGE OF THE QUESTIONNAIRE

Sponsored by:



Ministry of Higher Education



Universiti Utara Malaysia



**IMPROVISATION,
REASONING AND
FIRM PERFORMANCE**



May 2008

Dear Respondent,

Warm greetings! May we seek your help with our research project? The purpose of this study is to collect information on the factors influenced on firm improvisation, strategic reasoning and firm performance of technology-based companies in Malaysia. In completing this questionnaire, please consider it in relation to the single biggest **current project** pursued by your organization.

This survey will take about 15 minutes to complete.

Your help in completing and returning this survey is central to the success of this research project and would be highly appreciated! Please make each question a separate and independent judgment. Work at a fairly high speed through the questionnaire and do not worry or puzzle over individual items. There are no 'right' or 'wrong' answers to any of these questions. The questionnaire has been designed for you to be able to tick (✓) most of the items to enable you to complete the questionnaire in the shortest possible time. Your answers are very important to the accuracy of our study.

All responses to this survey will be kept confidential and secure. Results will be used only for academic purposes with no specific individuals identified.

Please return the completed questionnaire using the [self-addressed envelope enclosed](#) at your earliest possible convenience **or** please return and attach your completed questionnaires through my email address at D.Ahmad-Arshad@lboro.ac.uk

Thank you for your time and for sharing experiences.

Kind regards,
Darwina Arshad
Doctoral Researcher
Loughborough University, UK

Dr. Paul Hughes
Prof. Trevor Buck
PhD Supervisors,
Loughborough University, UK

☎ :017-4660043 (In Malaysia from 21st May to 12th August , 2008)
✉ : D.Ahmad-Arshad@lboro.ac.uk

			/				/	
The sequence number will be used for data validation purposes only								

APPENDIX 4

Please answer the following question by **ticking (✓)** the number that best represents your opinion with the following statements.

SECTION A

Q1	How strongly do you agree or disagree with each of the following statements about work in your organization?	Strongly ----- Strongly Disagree (1) Agree(7)						
		1	2	3	4	5	6	7
1.	We deal with unanticipated events on the spot.							
2.	We think on my feet when carrying out actions.							
3.	We respond in the moment to unexpected problems.							
4.	We try new approaches to problems.							
5.	We take risks in terms of producing new ideas in doing the job.							
6.	We demonstrate originality in my work.							
7.	We identify opportunities for new work process.							

Q2	How strongly do you agree or disagree with each of the following statements about your organization?	Strongly ----- Strongly Disagree (1) Agree(7)						
		1	2	3	4	5	6	7
8.	The technology used in our industry is changing rapidly.							
9.	The technology that is relevant to our market is changing rapidly.							
10.	A large number of new product ideas have been made possible through technological breakthroughs in the industry.							
11.	Technological changes provided big opportunities in the industry.							
12.	Customers' preferences change quite a bit over the time.							
13.	Our customers tend to look for new products all the time.							
14.	We witness demand for our products and services from customers who never bought them before.							
15.	Competition in our industry is cut-throat.							
16.	There are many 'promotion wars' in our industry.							
17.	Anything that one competitor can offer, others can match readily							
18.	Price competition is a hallmark of our industry.							
19.	One hears of a new competitive move almost every day.							
20.	Our competitors are relatively weak.							

Please answer the following question by **ticking** (✓) the number that best represents your (dis)agreement with the following statements.

Q3	How confident you are that you will be able to	Not at all ----- very confident (1) confident(7)						
		1	2	3	4	5	6	7
21.	make a strategic plan and execute it at the same time.							
22.	engage in spontaneous actions to create strategy within time pressures.							
23.	make intuitive judgments for taking actions.							
24.	improvise when the firm is faced with high levels of uncertainty in turbulent markets.							

Q4	To what extent is your expertise related to management?	Not at all (1)-----Great extent (7)						
		1	2	3	4	5	6	7
25.	I am aware of the critical managerial issues that affect my work.							
26.	I am current and knowledgeable about my field of work.							
27.	I have knowledge in diverse fields.							

Q5	While doing my work,	Not at all(1)----- very strong(7)						
		1	2	3	4	5	6	7
28.	I enjoy taking risks.							
29.	taking risks does not bother me if the potential gains are high.							
30.	people have told me that I seem to enjoy taking risks.							
	How much is your organization oriented towards risk taking as demonstrated in the following strategies?							
31.	heavy reliance on innovation							
32.	high debt financing							
33.	heavy R&D							
34.	high risk, high return investments							

Please answer the following question by **ticking (✓)** the number that best represents your (dis)agreement with the following statements.

Q6	How strongly do you agree or disagree with each of the following statements about your work in organization?	Strongly----- Strongly Disagree (1) Agree(7)						
		1	2	3	4	5	6	7
35.	I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.							
36.	I don't like to handle a situation that requires a lot of thinking.							
37.	I would prefer complex to simple problems.							
38.	I find little satisfaction in deliberating hard and for long hours.							
39.	Thinking is not my idea of fun.							
40.	The notion of thinking abstractly is not appealing to me.							
41.	Simply knowing the answer rather than understanding the reasons for the answer to a problem is fine with me.							
42.	I don't reason well under pressure.							
43.	The idea of relying on thought to make my way to the top does not appeal to me.							
44.	Learning new ways to think doesn't excite me very much.							
45.	I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.							
46.	I generally prefer to accept things as they are rather than to question them.							
47.	It is enough for me that something gets the job done; I don't care how or why it works.							
48.	I have difficulty thinking in new and unfamiliar situations.							
49.	My initial impressions of situations are almost always right.							
50.	I trust my initial feelings about decisions.							
51.	I believe in trusting my hunches on decisions.							
52.	I am a very intuitive person.							
53.	I often have clear visual images of things.							
54.	I am good at visualizing things.							

Please answer the following question by **ticking** (✓) the number that best represents your (dis)agreement with the following statements.

Q7	How strongly do you agree or disagree with each of the following statements about information and communication in your organization?	Strongly----- Strongly Disagree (1) Agree(7)						
		1	2	3	4	5	6	7
55.	Meetings are a good source of up-to-date information							
56.	Information about what is going on within the organization is readily shared at all levels							
57.	We regularly receive information about other departments' activities.							
58.	We have the necessary information about our external environment							
59.	There were well-defined procedures for developing this product.							
60.	We keep records of past projects.							
61.	We have information systems to support the work.							
62.	We have files and databases that are up to date.							

Q8	How strongly do you agree or disagree with each of the following statements about your organizational structure?	Strongly----- Strongly Disagree (1) Agree(7)						
		1	2	3	4	5	6	7
63.	There can be little action taken in the organization until a superior makes a decision.							
64.	A person who wants to make his/her own decisions would be quickly discouraged in the organisation.							
65.	Even small matters have to be referred to someone with more authority for a final decision.							
66.	Any decision a person in the organisation makes has to have his/her boss's approval.							
67.	Most people in the organisation follow written work rules for their job.							
68.	How things are done in the organisation is never left up to the person doing the work.							

Please answer the following question by **ticking** (✓) the number that best represents your (dis)agreement with the following statements.

Q9	How strongly do you agree or disagree with each of the following statements about your organizational goal?	Strongly-----Strongly Disagree (1) Agree(7)						
		1	2	3	4	5	6	7
69.	We have a clear vision of the target market (user).							
70.	We have a clear understanding of target customers' needs and wants.							
71.	The overall business goals are clear.							

Q10	These questions are concerned with your experiences at work. Over the last 6 months, to what extent you ...	Not at all (1)-----Great extent (7)						
		1	2	3	4	5	6	7
72.	explored a wide variety of approaches to a problem.							
73.	planned ahead rather than reacted to a situation.							
74.	created multiple courses of action during planning.							
75.	adjusted well to new equipment, process, or procedures in your tasks.							
76.	been able to adapt your personal approach to the situation at hand.							
77.	coped with stressful events effectively.							
78.	maintained productivity in challenging circumstances.							
79.	adapted to change with minimal stress.							
80.	given your work context would consider yourself to be a flexible person.							
81.	explored a wide variety of approaches to a problem.							
82.	adapted your company strategy adequately to changes in the business environment of your organisation?							
83.	adapted your company strategy adequately to changes in competitors' product-market strategies?							
84.	adapted your company strategy quickly to the changing needs of customers?							
85.	reacted quickly to new product-market threats?							

SECTION B: FIRM PERFORMANCE

Q12	<i>Please tick (✓) or fill in the blank where appropriate.</i>							
1.	Approximately,	a) What has been your average TOTAL sales turnover over the last three years?	RM _____					
		b) What has been your company's sales turnover in the last year?	RM _____					
		c) What has been the value of your company's TOTAL assets in the last year?	RM _____					
		d) What has been the value of your company's Research & Development (R&D) expenditure in the last year?	RM _____					
2.	Relative to your industry's average or to comparable organizations, what is your opinion of the performance of your organization in regard to the following criteria?	<i>Very----- Weak (1) Very Strong (7)</i>						
		1	2	3	4	5	6	7
86.	Long term profitability							
87.	Sales growth							
88.	Financial resources (liquidity and investment capacity)							
89.	Public image							
90.	Client loyalty							

SECTION C: FIRM INFORMATION

Q13	<i>Please tick (✓) or fill in the blank where appropriate.</i>		
1.	How many full time employees presently work in your business (approximate number)?		
2.	How many years has your business been operating (approximate number)?		years
3.	For how many years have you been competing in this industry?		years
4.	Please state what industry/sector most accurately describes the market your business operates within? <i>(Please state more than one if you feel it is necessary).</i>		

SECTION D: PERSONAL INFORMATION

Q14		<i>Please tick (/) or fill in the blank where appropriate.</i>	
1.	What is your current position in the business?	<input type="checkbox"/>	Chief Executive Officer
		<input type="checkbox"/>	Chief Operation Officer
		<input type="checkbox"/>	Managing Director
		<input type="checkbox"/>	General Manager
		<input type="checkbox"/>	Manager
		<input type="checkbox"/>	Project Manager
		<input type="checkbox"/>	Other (please specify) _____
2.	How long have you been in the current position?	<input type="text"/>	years
3.	How long have you been with the company?	<input type="text"/>	years
4.	How long have you been experienced in this industry?	<input type="text"/>	years
5.	Your Gender : Male (M) or Female (F)	<input type="text"/>	<i>(Please state M or F in the given box)</i>
6.	Your age is:	<input type="text"/>	years
7.	Your highest level of education is:	<input type="checkbox"/>	Masters or higher
		<input type="checkbox"/>	Degree
		<input type="checkbox"/>	Diploma
		<input type="checkbox"/>	SPM/STPM

		<i>No-----Full</i>						
		<i>Knowledge (1)</i>			<i>Knowledge (7)</i>			
		1	2	3	4	5	6	7
1.	To what extent do you feel you possess knowledge regarding the questions asked in this questionnaire?							
2.	To what extent do you believe the responses given by you accurately reflect the 'realities' of your organization involvement in your current business situation?							

<p>Please use this space to write any comments you wish to make</p> <p>-----</p> <p>-----</p> <p>-----</p>

**THANK YOU VERY MUCH FOR SPENDING YOUR PRECIOUS TIME
 ANSWERING THE QUESTIONNAIRE.
 Your contribution to this study is highly appreciated.**

Would you like a copy of the summary of the results of this research?

- Yes No

If **Yes**, please supply a name and address below (or attach a business card):

Name:	
Position:	
Address:	

INFORMATION GATHERED WILL BE KEPT STRICTLY CONFIDENTIAL

Please return the completed questionnaire using the [self-addressed envelope enclosed](#) at your earliest possible convenience

or

Please return and attach your completed questionnaires through my email address at D.Ahmad-Arshad@lboro.ac.uk

Thank you for your help!

APPENDIX 5

BusinessSchool
LoughboroughUniversity Leicestershire LE11 3TU UK
Swithboard: +44 (0)1509 263171



Mr. Lim Choon Leng
Chief Technology Officer
Agbio Tech Sdn. Bhd.
352 Jalan Kota Kenari 4
Kota Kenari, 09000 Kulim
Kedah

30June 2008

Dear Mr Lim Choon Leng,

RESEARCH ON IMPROVISATION, STRATEGIC REASONING AND FIRM PERFORMANCE

About a month ago I wrote to you seeking your opinion on the firm improvisation, strategic reasoning and firm performance. As of today we have not yet received your completed questionnaire.

Our research unit has undertaken this study because of the belief that these information should be taken into account in the formation policies for the planning and development of technology-based firms in Malaysia. Addressing the specific context on management perspectives of technology-based companies in Malaysia, this significant contribution of the study is highly expected to achieve the success of the target in Ninth Malaysia Plan.

I am writing to you again because of the significance each questionnaire has to the usefulness of this study. Your firm was drawn through a scientific sampling process in which every firm has an equal chance of being selected. In order for the results of this study to be truly representative of all technology-based firms in Malaysia, it is essential that each firm in the sample return their questionnaire. As mention in our last letter, the utmost confidentiality will be observed in using the information given. All responses you provide will be completely anonymous and this information will not be shared with anyone outside of the research team of myself and my supervisors.

In the event that your questionnaire has been misplaced, a replacement is enclosed.

Your cooperation is highly appreciated.

Yours sincerely,

DARWINA ARSHAD
Doctoral Researcher
LoughboroughUniversity
United Kingdom

APPENDIX 6



KEMENTERIAN SAINS, TEKNOLOGI DAN INOVASI MALAYSIA
Aras 3-7, Parcel C, Pusat Pentadbiran Kerajaan Persekutuan
62666 Putrajaya, Malaysia

MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATION,
MALAYSIA
Level 3-7, Block C4, Parcel C, Federal Government Administrative Centre
62662 Putrajaya, Malaysia

603-8885 8000
(Tel.)
603-8888 9070
(Fax)

September 21, 2007

To whom It May Concern,

MS DARWINA AHMAD ARSHAD – QUESTIONNAIRE DISTRIBUTION (PhD RESEARCH)

I am pleased to inform you that Ms. Darwina Ahmad Arshad is a PhD student of Loughborough University pursuing research on “The Interplay of Strategic Improvisation, Reasoning and Firm Performance on High Technology Industry in Malaysia”.

This research is very pertinent to high technology development in this country. I hope you will give her your kind cooperation to enable her to complete the questionnaire.

Thank you.

Yours sincerely,

(DATO' DR. MOHAMMAD NOOR EMBI)

For Secretary-General

Ministry of Science, Technology and Innovation Malaysia
dc

APPENDIX 7

SETEM TIDAK DIPERLUKAN

NO STAMP REQUIRED

JAWAPAN BERBAYAR / REPLY PAID
MALAYSIA
No. Lesen : BRS 0590 KED

DARWINA ARSHAD
24 Taman Indah
Titi Gajah
06550 Alor Star
KEDAH

APPENDIX 8

A REMINDER LETTER



16 June 2008

A questionnaire has been posted to you recently about a study I am conducting into firm's improvisation, strategic reasoning and how to improve business performance.

If you have already completed and posted the questionnaire to us please accept our sincere thanks and gratitude. If not, it would be much appreciated if you could complete the questionnaire and send it back to us as soon as is convenient using the address given in the questionnaire. The utmost confidentiality will be observed in using the information given. All responses you provide will be completely anonymous and this information will not be shared with anyone outside of the research team of myself and my supervisors.

If by some chance you did not receive the questionnaire, or it got misplaced, please do contact us either by phone: 006-0174660043 or E-mail: D.Ahmad-Arshad@lboro.ac.uk and a copy will be posted to you soon.

Your help is really appreciated. Thank you.

Yours sincerely,

Darwina Arshad
Doctoral Researcher

APPENDIX 9

TEST OF HOMOGENEITY OF VARIANCES ACROSS FOUR INDUSTRIES

Variables	Levene Statistic	df1	df2	Sig.
<i>Improvisation</i>				
deal with unanticipated events	.583	3	124	.627
think on my feet	.844	3	124	.472
respond in the moment	.285	3	124	.836
try new approaches to problems	2.040	3	124	.112
take risks when producing new ideas	3.033	3	124	.032
demonstrate originality	1.353	3	124	.260
identify opportunities	.574	3	124	.633
<i>Cognitive Factor</i>				
challenge thinking abilities	1.436	3	124	.235
requires a lot of thinking	.263	3	124	.852
prefer complex problems	.303	3	124	.823
little satisfaction	1.204	3	124	.311
thinking is not my idea of fun	.178	3	124	.911
the notion of thinking	.313	3	124	.816
understanding the reasons for the answer to a problem	3.173	3	124	.027
don't reason well under pressure	1.024	3	124	.385
the idea of relying on thought	.934	3	124	.427
learning new ways to think	2.993	3	124	.034
prefer a task that is intellectual, difficult, and important	.847	3	124	.471
prefer to accept things as they are	1.907	3	124	.132
enough for me that something gets the job done	.352	3	124	.788
difficulty thinking in new and unfamiliar situations	2.278	3	124	.083
initial impressions of situations are almost always right	2.601	3	124	.055
trust my initial feelings	.357	3	124	.784
believe in trusting my hunches	.904	3	124	.441
very intuitive person	.203	3	124	.894
have clear visual images of things	.799	3	124	.497

good at visualizing things	.298	3	124	.827
<i>Individual Managerial Factor</i>				
make and execute a strategic plan simultaneously	.363	3	124	.780
engage in spontaneous actions	2.138	3	124	.099
make intuitive judgments	1.454	3	124	.230
improvise when the company facing uncertainty	.383	3	124	.765
aware of critical managerial issues	2.292	3	124	.081
knowledgeable about work	.364	3	124	.779
knowledge in diverse fields	1.014	3	124	.389
enjoy taking risks	.616	3	124	.606
not bother to take risks	.785	3	124	.505
people told - enjoy taking risks	2.085	3	124	.106
<i>Organizational Factor</i>				
clear vision of the target market	.978	3	124	.405
clear understanding of target customers' needs and wants	.239	3	124	.869
Overall business goals are clear	2.194	3	124	.092
little action taken until a superior makes a decision	.917	3	124	.435
own decisions would be discouraged	.467	3	124	.706
small matters have to be referred to someone with more authority	.084	3	124	.969
any decision has to have boss's approval	1.401	3	124	.246
People follow written work rules	.775	3	124	.510
things are done is never left up	.723	3	124	.540
explore a wide variety of approaches to a problem	.904	3	124	.441
plan ahead	1.223	3	124	.304
create multiple courses of action	.629	3	124	.598
adjust well to new equipment, process, or procedures	1.801	3	124	.151
adapt personal approach to the situation at hand	5.361	3	124	.002
cope with stressful events effectively	.433	3	124	.730
maintain productivity in challenging circumstances	2.677	3	124	.050
adapt to change with minimal stress	1.966	3	124	.123
consider to be a flexible person	.580	3	124	.629

adapt company strategy adequately to changes in the business environment	.408	3	124	.748
adapt company strategy adequately to changes in competitors' product-market strategies	1.122	3	124	.343
adapt company strategy quickly to the changing needs of customers	.612	3	124	.608
react quickly to new product-market threats	3.700	3	124	.014
heavy reliance on innovation	.732	3	124	.535
high debt financing	1.458	3	124	.229
heavy R&D	.388	3	124	.762
high risk, high return investments	1.969	3	124	.122
up-to-date information through meetings	1.306	3	124	.275
Readily shared information within organization	.128	3	124	.943
Receive information about other departments' activities	1.243	3	124	.297
information on external environment	.474	3	124	.701
well-defined procedures	.423	3	124	.737
keep records of past projects	.633	3	124	.595
information systems to support work	1.547	3	124	.206
up-to-date files and databases	1.468	3	124	.227
<i>Environmental Turbulence</i>				
technology used changing rapidly	3.745	3	124	.013
relevant technology changing rapidly	.562	3	124	.641
technological breakthroughs in the industry	1.286	3	124	.282
Technological changes provided big opportunities	.590	3	124	.623
changes of customers' preferences	.007	3	124	.999
customers tend to look for new products all the time	1.272	3	124	.287
witness demand from new customers	.769	3	124	.513
competition is cut-throat	2.609	3	124	.055
many 'promotion wars'	1.100	3	124	.352
competitors can readily match	1.523	3	124	.212
price competition is a hallmark	.374	3	124	.772
new competitive move almost every day	1.040	3	124	.377

our competitors are weak	.238	3	124	.870
<i>Firm Performance</i>				
Long term profitability	.987	3	124	.401
Sales growth	.506	3	124	.679
Financial resources (liquidity and investment capacity)	1.171	3	124	.323
Public image	.416	3	124	.742
Client loyalty	.199	3	124	.897

APPENDIX 10

TEST OF HOMOGENEITY OF VARIANCES ACCORDING TOTAL ANNUAL SALES TURNOVER AND NUMBER OF EMPLOYEES

	Test of Homogeneity of Variances							
	according Total Annual Sales Turnover				according Number of Employees			
	Levene Statistic	df1	df2	Sig.	Levene Statistic	df1	df2	Sig.
<i>Improvisation</i>								
deal with unanticipated events	.886	3	78	.452	.572	3	124	.635
think on my feet	.198	3	78	.898	1.175	3	124	.322
respond in the moment	1.022	3	78	.388	.410	3	124	.746
try new approaches to problems	.067	3	78	.977	1.169	3	124	.325
take risks when producing new ideas	.623	3	78	.602	1.077	3	124	.362
demonstrate originality	.245	3	78	.864	.928	3	124	.430
identify opportunities	1.773	3	78	.159	2.544	3	124	.059
<i>Cognitive Factor</i>								
challenge thinking abilities	5.320	3	78	.002*	3.546	3	124	.017*
requires a lot of thinking	.084	3	78	.968	.967	3	124	.411
prefer complex problems	.065	3	78	.978	.196	3	124	.899
little satisfaction	.875	3	78	.458	.605	3	124	.613
thinking is not my idea of fun	.749	3	78	.526	2.604	3	124	.055
the notion of thinking	1.103	3	78	.353	.844	3	124	.472
understanding the reasons for the answer to a problem	.459	3	78	.712	.687	3	124	.562
don't reason well under pressure	.307	3	78	.820	3.247	3	124	.024*
the idea of relying on thought	1.317	3	78	.275	1.417	3	124	.241
learning new ways to think	1.004	3	78	.396	1.873	3	124	.138
prefer a task that is intellectual, difficult, and important	.437	3	78	.727	.335	3	124	.800
prefer to accept things as they are enough for me that something gets the job done	.682	3	78	.566	.971	3	124	.409
difficulty thinking in new and unfamiliar situations	1.009	3	78	.393	3.353	3	124	.021*
initial impressions of situations are almost always right	.335	3	78	.800	.111	3	124	.953
trust my initial feelings	2.127	3	78	.103	2.990	3	124	.034*
believe in trusting my hunches	.689	3	78	.562	.324	3	124	.808
very intuitive person	.629	3	78	.598	.989	3	124	.400
have clear visual images of things	.812	3	78	.491	.998	3	124	.396
good at visualizing things	1.863	3	78	.143	.842	3	124	.473
	1.266	3	78	.292	.511	3	124	.675
<i>Individual Managerial Factor</i>								
make and execute a strategic plan simultaneously	3.483	3	78	.020*	.861	3	124	.463
engage in spontaneous actions	.372	3	78	.773	.810	3	124	.491

make intuitive judgments	1.206	3	78	.313	.324	3	124	.808
improvise when the company facing uncertainty	1.708	3	78	.172	3.238	3	124	.025*
aware of critical managerial issues	1.585	3	78	.200	1.519	3	124	.213
knowledgeable about work	.037	3	78	.990	.234	3	124	.873
knowledge in diverse fields	1.553	3	78	.207	.851	3	124	.469
enjoy taking risks	2.567	3	78	.060	1.750	3	124	.160
not bother to take risks	.631	3	78	.597	.531	3	124	.662
people told - enjoy taking risks	.594	3	78	.621	1.546	3	124	.206
Organizational Factor								
up-to-date information through meetings	.276	3	78	.842	.353	3	124	.787
Readily shared information within organization	1.026	3	78	.386	.733	3	124	.534
Receive information about other departments' activities	.658	3	78	.581	1.408	3	124	.244
information on external environment	.727	3	78	.539	.347	3	124	.791
well-defined procedures	1.956	3	78	.128	.499	3	124	.684
keep records of past projects	1.192	3	78	.318	.236	3	124	.871
information systems to support work	2.067	3	78	.111	1.476	3	124	.224
up-to-date files and databases	1.573	3	78	.203	.064	3	124	.979
little action taken until a superior makes a decision	.696	3	78	.557	.348	3	124	.791
own decisions would be discouraged	.893	3	78	.448	1.298	3	124	.278
small matters have to be referred to someone with more authority	.644	3	78	.589	.752	3	124	.523
any decision has to have boss's approval	1.685	3	78	.177	.224	3	124	.879
People follow written work rules	1.405	3	78	.248	.058	3	124	.982
things are done is never left up	2.883	3	78	.041*	.981	3	124	.404
clear vision of the target market	1.767	3	78	.160	.288	3	124	.834
clear understanding of target customers' needs and wants	.755	3	78	.523	.787	3	124	.503
Overall business goals are clear	2.735	3	78	.049*	.258	3	124	.855
explore a wide variety of approaches to a problem	.946	3	78	.422	.215	3	124	.886
plan ahead	.218	3	78	.883	.528	3	124	.664
create multiple courses of action	.360	3	78	.782	1.298	3	124	.278
adjust well to new equipment, process, or procedures	.490	3	78	.690	.420	3	124	.739
adapt personal approach to the situation at hand	1.350	3	78	.264	.749	3	124	.525
cope with stressful events effectively	.871	3	78	.460	.235	3	124	.871
maintain productivity in challenging circumstances	.957	3	78	.417	.192	3	124	.901
adapt to change with minimal stress	.285	3	78	.836	.698	3	124	.555
consider to be a flexible person	1.337	3	78	.268	.572	3	124	.634
adapt company strategy adequately to changes in the business environment	.665	3	78	.576	.553	3	124	.647
adapt company strategy adequately to changes in competitors' product-market strategies	.253	3	78	.859	1.596	3	124	.194
adapt company strategy quickly to the	1.853	3	78	.145	.732	3	124	.535

changing needs of customers								
react quickly to new product-market threats	8.723	3	78	.000*	3.075	3	124	.030*
heavy reliance on innovation	1.189	3	78	.319	.529	3	124	.663
high debt financing	1.331	3	78	.270	.723	3	124	.540
heavy R&D	.611	3	78	.610	1.189	3	124	.317
high risk, high return investments	1.162	3	78	.330	2.211	3	124	.090
<i>Environmental Turbulence</i>								
technology used changing rapidly	.653	3	78	.584	1.101	3	124	.351
relevant technology changing rapidly	1.040	3	78	.380	.073	3	124	.974
technological breakthroughs in the industry	.476	3	78	.700	1.816	3	124	.148
Technological changes provided big opportunities	1.105	3	78	.352	.714	3	124	.545
changes of customers' preferences	.583	3	78	.628	1.110	3	124	.348
customers tend to look for new products all the time	2.276	3	78	.086	.521	3	124	.668
witness demand from new customers	.752	3	78	.525	.289	3	124	.834
competition is cut-throat	.271	3	78	.846	2.090	3	124	.105
many 'promotion wars'	2.616	3	78	.057	.109	3	124	.955
competitors can readily match	2.244	3	78	.090	2.214	3	124	.090
price competition is a hallmark	1.355	3	78	.263	.391	3	124	.760
new competitive move almost every day	1.192	3	78	.318	1.933	3	124	.128
our competitors are weak	.284	3	78	.837	1.025	3	124	.384
<i>Firm Performance</i>								
Long term profitability	.071	3	78	.975	.301	3	124	.824
Sales growth	.237	3	78	.871	.445	3	124	.721
Financial resources (liquidity and investment capacity)	5.319	3	78	.002*	.811	3	124	.490
Public image	1.897	3	78	.137	2.947	3	124	.036*
Client loyalty	2.727	3	78	.050	.051	3	124	.985

APPENDIX 11

INDEPENDENT SAMPLES T-TEST FOR NON-RESPONSE BIAS

Variable	Equal variances	t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Improvisation_1.	assumed	1.928	78	.058	.50000	.25938	-.01638	1.01638
	not assumed	1.928	74.426	.058	.50000	.25938	-.01677	1.01677
Improvisation_2.	assumed	-.670	78	.505	-.22500	.33558	-.89308	.44308
	not assumed	-.670	76.556	.505	-.22500	.33558	-.89328	.44328
Improvisation_3.	assumed	.190	78	.849	.05000	.26251	-.47261	.57261
	not assumed	.190	76.247	.849	.05000	.26251	-.47280	.57280
Improvisation_4.	assumed	.852	78	.397	.17500	.20549	-.23411	.58411
	not assumed	.852	77.758	.397	.17500	.20549	-.23413	.58413
Improvisation_5.	assumed	-.344	78	.732	-.10000	.29045	-.67823	.47823
	not assumed	-.344	76.170	.732	-.10000	.29045	-.67845	.47845
Improvisation_6.	assumed	.303	78	.762	.07500	.24713	-.41700	.56700
	not assumed	.303	76.675	.762	.07500	.24713	-.41713	.56713
Improvisation_7.	assumed	2.132	78	.036	.45000	.21107	.02979	.87021
	not assumed	2.132	70.119	.037	.45000	.21107	.02904	.87096
Tech_Turbulent_1	assumed	-	78	.052	-.47500	.24069	-.95418	.00418
	not assumed	1.973	68.117	.052	-.47500	.24069	-.95528	.00528
Tech_Turbulent_2	assumed	-	78	.259	-.27500	.24202	-.75682	.20682
	not assumed	1.136	77.981	.259	-.27500	.24202	-.75683	.20683
Tech_Turbulent_3	assumed	-.848	78	.399	-.20000	.23582	-.66947	.26947
	not assumed	-.848	73.604	.399	-.20000	.23582	-.66991	.26991
TechTurbulent_4	assumed	.970	78	.335	.22500	.23188	-.23663	.68663
	not assumed	.970	77.645	.335	.22500	.23188	-.23666	.68666
Mkt_Turbulent_1	assumed	.101	78	.920	.02500	.24726	-.46726	.51726
	not assumed	.101	75.819	.920	.02500	.24726	-.46748	.51748

Mkt_Turbulent_2	assumed	1.647	78	.104	.42500	.25804	-.08873	.93873
	not assumed	1.647	77.961	.104	.42500	.25804	-.08873	.93873
Mkt_Turbulent_3	assumed	-.102	78	.919	-.02500	.24609	-.51493	.46493
	not assumed	-.102	75.962	.919	-.02500	.24609	-.51514	.46514
Comp_Turbulent_1	assumed	1.562	78	.122	.45000	.28812	-.12360	1.02360
	not assumed	1.562	75.044	.123	.45000	.28812	-.12396	1.02396
Comp_Turbulent_2	assumed	1.185	78	.240	.42500	.35875	-.28922	1.13922
	not assumed	1.185	77.969	.240	.42500	.35875	-.28922	1.13922
Comp_Turbulent_3	assumed	-.802	78	.425	-.27500	.34285	-.95757	.40757
	not assumed	-.802	69.489	.425	-.27500	.34285	-.95889	.40889
Comp_Turbulent_4	assumed	1.063	78	.291	.35000	.32924	-.30546	1.00546
	not assumed	1.063	77.775	.291	.35000	.32924	-.30549	1.00549
Comp_Turbulent_5	assumed	-.544	78	.588	-.20000	.36755	-.93174	.53174
	not assumed	-.544	77.986	.588	-.20000	.36755	-.93175	.53175
Comp_Turbulent_6	assumed	1.354	78	.180	.52500	.38761	-.24667	1.29667
	not assumed	1.354	77.521	.180	.52500	.38761	-.24674	1.29674
Confidence_1	assumed	-.898	78	.372	-.22500	.25061	-.72392	.27392
	not assumed	-.898	75.460	.372	-.22500	.25061	-.72419	.27419
Confidence_2	assumed	-.703	78	.484	-.17500	.24907	-.67086	.32086
	not assumed	-.703	78.000	.484	-.17500	.24907	-.67086	.32086
Confidence_3	assumed	-.115	78	.909	-.02500	.21732	-.45765	.40765
	not assumed	-.115	73.549	.909	-.02500	.21732	-.45806	.40806
Confidence_4	assumed	.107	78	.915	.02500	.23435	-.44155	.49155
	not assumed	.107	77.603	.915	.02500	.23435	-.44159	.49159
Expertise_1	assumed	2.584	78	.012	.55000	.21289	.12618	.97382
	not assumed	2.584	70.240	.012	.55000	.21289	.12544	.97456
Expertise_2	assumed	1.655	78	.102	.37500	.22656	-.07605	.82605
	not assumed	1.655	70.496	.102	.37500	.22656	-.07681	.82681
Expertise_3	assumed	2.349	78	.021	.55000	.23411	.08392	1.01608
	not assumed	2.349	77.765	.021	.55000	.23411	.08390	1.01610
Individual_risk1	assumed	2.309	78	.024	.52500	.22741	.07226	.97774
	not assumed	2.309	77.991	.024	.52500	.22741	.07226	.97774
Individual_risk2	assumed	-.189	78	.850	-.05000	.26397	-.57552	.47552

Individual_risk3	not assumed	-.189	76.636	.850	-.05000	.26397	-.57567	.47567
	assumed	.156	78	.877	.05000	.32121	-.58947	.68947
Organisational_risk1	not assumed	.156	77.997	.877	.05000	.32121	-.58947	.68947
	assumed	-.551	78	.583	-.15000	.27210	-.69171	.39171
Organisational_risk2	not assumed	-.551	75.099	.583	-.15000	.27210	-.69204	.39204
	assumed	-.585	78	.560	-.22500	.38470	-.99089	.54089
Organisational_risk3	not assumed	-.585	74.361	.560	-.22500	.38470	-.99148	.54148
	assumed	-.437	78	.663	-.15000	.34320	-.83327	.53327
Organisational_risk4	not assumed	-.437	75.948	.663	-.15000	.34320	-.83356	.53356
	assumed	-	78	.105	-.55000	.33579	-1.21851	.11851
Reasoning_1	not assumed	1.638	72.404	.106	-.55000	.33579	-1.21933	.11933
	assumed	1.566	78	.121	.52500	.33529	-.14251	1.19251
Reasoning_2	not assumed	1.566	78.000	.121	.52500	.33529	-.14251	1.19251
	assumed	2.205	78	.030	.60000	.27216	.05817	1.14183
Reasoning_3	not assumed	2.205	76.152	.031	.60000	.27216	.05797	1.14203
	assumed	-	78	.171	-.42500	.30778	-1.03774	.18774
Reasoning_4	not assumed	1.381	73.579	.172	-.42500	.30778	-1.03832	.18832
	assumed	1.297	78	.198	.45000	.34692	-.24066	1.14066
Reasoning_5	not assumed	1.297	77.989	.198	.45000	.34692	-.24066	1.14066
	assumed	.074	78	.941	.02500	.33767	-.64725	.69725
Reasoning_6	not assumed	.074	77.348	.941	.02500	.33767	-.64734	.69734
	assumed	.151	78	.881	.05000	.33157	-.61010	.71010
Reasoning_7	not assumed	.151	77.698	.881	.05000	.33157	-.61014	.71014
	assumed	-	78	.224	-.40000	.32655	-1.05011	.25011
Reasoning_8	not assumed	1.225	75.791	.224	-.40000	.32655	-1.05041	.25041
	assumed	.942	78	.349	.27500	.29196	-.30625	.85625
Reasoning_9	not assumed	.942	77.172	.349	.27500	.29196	-.30635	.85635
	assumed	-.707	78	.482	-.22500	.31822	-.85853	.40853
Reasoning_10	not assumed	-.707	77.915	.482	-.22500	.31822	-.85854	.40854
	assumed	-.676	78	.501	-.20000	.29607	-.78944	.38944
Reasoning_11	not assumed	-.676	77.048	.501	-.20000	.29607	-.78955	.38955
	assumed	.143	78	.886	.05000	.34853	-.64387	.74387

	not assumed	.143	77.651	.886	.05000	.34853	-.64392	.74392
Reasoning_12	assumed	1.241	78	.218	.37500	.30210	-.22644	.97644
	not assumed	1.241	77.878	.218	.37500	.30210	-.22646	.97646
Reasoning_13	assumed	-.084	78	.933	-.02500	.29847	-.61922	.56922
	not assumed	-.084	75.550	.933	-.02500	.29847	-.61952	.56952
Reasoning_14	assumed	1.924	78	.058	.55000	.28589	-.01916	1.11916
	not assumed	1.924	74.484	.058	.55000	.28589	-.01958	1.11958
Reasoning_15	assumed	-.748	78	.457	-.22500	.30083	-.82390	.37390
	not assumed	-.748	77.405	.457	-.22500	.30083	-.82397	.37397
Reasoning_16	assumed	-	78	.222	-.40000	.32483	-1.04668	.24668
	not assumed	-	77.118	.222	-.40000	.32483	-1.04680	.24680
Reasoning_17	assumed	-.864	78	.390	-.25000	.28929	-.82592	.32592
	not assumed	-.864	77.959	.390	-.25000	.28929	-.82593	.32593
Reasoning_18	assumed	-.906	78	.368	-.25000	.27584	-.79916	.29916
	not assumed	-.906	77.144	.368	-.25000	.27584	-.79926	.29926
Reasoning_19	assumed	.304	78	.762	.07500	.24648	-.41571	.56571
	not assumed	.304	77.964	.762	.07500	.24648	-.41571	.56571
reason_20	assumed	.000	78	1.000	.00000	.24390	-.48557	.48557
	not assumed	.000	77.425	1.000	.00000	.24390	-.48562	.48562
Org_Info_1	assumed	-.483	78	.631	-.15000	.31065	-.76847	.46847
	not assumed	-.483	75.209	.631	-.15000	.31065	-.76883	.46883
Org_Info_2	assumed	1.353	78	.180	.37500	.27721	-.17687	.92687
	not assumed	1.353	77.725	.180	.37500	.27721	-.17690	.92690
Org_Info_3	assumed	1.327	78	.188	.37500	.28259	-.18759	.93759
	not assumed	1.327	77.855	.188	.37500	.28259	-.18761	.93761
Org_Info_4	assumed	1.896	78	.062	.45000	.23737	-.02257	.92257
	not assumed	1.896	76.355	.062	.45000	.23737	-.02273	.92273
Org_Memory_1	assumed	.989	78	.326	.25000	.25287	-.25342	.75342
	not assumed	.989	77.805	.326	.25000	.25287	-.25344	.75344
Org_Memory_2	assumed	-.100	78	.921	-.02500	.25125	-.52519	.47519
	not assumed	-.100	76.061	.921	-.02500	.25125	-.52540	.47540
Org_Memory_3	assumed	1.445	78	.152	.40000	.27683	-.15113	.95113

	not assumed	1.445	68.695	.153	.40000	.27683	-.15230	.95230
Org_Memory_4	assumed	1.260	78	.211	.32500	.25792	-.18848	.83848
	not assumed	1.260	75.477	.212	.32500	.25792	-.18875	.83875
Organisational structure_1	assumed	1.074	78	.286	.35000	.32576	-.29855	.99855
	not assumed	1.074	77.716	.286	.35000	.32576	-.29858	.99858
Organisational structure_2	assumed	2.343	78	.022	.70000	.29872	.10530	1.29470
	not assumed	2.343	76.983	.022	.70000	.29872	.10518	1.29482
Organisational structure_3	assumed	.884	78	.380	.30000	.33945	-.37579	.97579
	not assumed	.884	77.208	.380	.30000	.33945	-.37590	.97590
Organisational structure_4	assumed	.261	78	.795	.10000	.38377	-.66402	.86402
	not assumed	.261	76.151	.795	.10000	.38377	-.66431	.86431
Organisational structure_5	assumed	-	78	.140	-.52500	.35217	-1.22611	.17611
	not assumed	-	76.566	.140	-.52500	.35217	-1.22632	.17632
Organisational structure_6	assumed	.668	78	.506	.22500	.33701	-.44593	.89593
	not assumed	.668	74.149	.506	.22500	.33701	-.44648	.89648
Organisational goal_1	assumed	.180	78	.858	.05000	.27816	-.50377	.60377
	not assumed	.180	74.413	.858	.05000	.27816	-.50419	.60419
Organisational goal_2	assumed	.569	78	.571	.15000	.26348	-.37455	.67455
	not assumed	.569	75.551	.571	.15000	.26348	-.37482	.67482
Organisational goal_3	assumed	.992	78	.324	.27500	.27732	-.27710	.82710
	not assumed	.992	73.052	.325	.27500	.27732	-.27769	.82769
Organisational flexibility_1	assumed	-.233	78	.816	-.05000	.21469	-.47741	.37741
	not assumed	-.233	77.022	.816	-.05000	.21469	-.47749	.37749
Organisational flexibility_2	assumed	1.688	78	.095	.35000	.20740	-.06289	.76289
	not assumed	1.688	78.000	.095	.35000	.20740	-.06289	.76289
Organisational flexibility_3	assumed	.289	78	.774	.07500	.25978	-.44218	.59218

	not assumed	.289	77.979	.774	.07500	.25978	-.44218	.59218
Organisational flexibility_4	assumed	.699	78	.486	.15000	.21446	-.27696	.57696
	not assumed	.699	72.272	.487	.15000	.21446	-.27749	.57749
Organisational flexibility_5	assumed	.520	78	.605	.10000	.19240	-.28305	.48305
	not assumed	.520	68.271	.605	.10000	.19240	-.28391	.48391
Organisational flexibility_6	assumed	1.481	78	.143	.30000	.20255	-.10324	.70324
	not assumed	1.481	77.564	.143	.30000	.20255	-.10328	.70328
Organisational flexibility_7	assumed	2.120	78	.037	.40000	.18870	.02432	.77568
	not assumed	2.120	77.598	.037	.40000	.18870	.02429	.77571
Organisational flexibility_8	assumed	3.023	78	.003	.62500	.20674	.21342	1.03658
	not assumed	3.023	76.566	.003	.62500	.20674	.21330	1.03670
Organisational flexibility_9	assumed	1.576	78	.119	.32500	.20627	-.08566	.73566
	not assumed	1.576	77.454	.119	.32500	.20627	-.08570	.73570
Organisational flexibility_10	assumed	1.863	78	.066	.37500	.20124	-.02563	.77563
	not assumed	1.863	77.386	.066	.37500	.20124	-.02568	.77568
Organisational adaptability_11	assumed	.746	78	.458	.17500	.23462	-.29210	.64210
	not assumed	.746	76.941	.458	.17500	.23462	-.29220	.64220
Organisational flexibility_12	assumed	2.098	78	.039	.45000	.21446	.02304	.87696
	not assumed	2.098	77.951	.039	.45000	.21446	.02304	.87696
Organisational flexibility_13	assumed	-.608	78	.545	-.17500	.28798	-.74832	.39832
	not assumed	-.608	77.903	.545	-.17500	.28798	-.74834	.39834
Performance_1	assumed	-.367	78	.715	-.10000	.27239	-.64230	.44230
	not assumed	-.367	77.611	.715	-.10000	.27239	-.64234	.44234
Performance_2	assumed	-.903	78	.369	-.25000	.27683	-.80113	.30113
	not assumed	-.903	75.445	.369	-.25000	.27683	-.80142	.30142
Performance_3	assumed	.184	78	.855	.05000	.27210	-.49171	.59171

Performance_4	not assumed	.184	77.208	.855	.05000	.27210	-.49180	.59180
	assumed	.103	78	.918	.02500	.24215	-.45709	.50709
Performance_5	not assumed	.103	71.524	.918	.02500	.24215	-.45778	.50778
	assumed	-.553	78	.582	-.15000	.27122	-.68995	.38995
	not assumed	-.553	76.286	.582	-.15000	.27122	-.69014	.39014

APPENDIX 12

ANALYSIS OF COMMON METHOD BIAS

Communalities

	Initial	Extraction
improv_1.	1.000	.721
improv_2.	1.000	.764
improv_3.	1.000	.728
improv_4.	1.000	.722
improv_5.	1.000	.767
improv_6.	1.000	.715
improv_7.	1.000	.775
reason_1	1.000	.739
reason_2	1.000	.703
reason_3	1.000	.751
reason_4	1.000	.674
reason_5	1.000	.719
reason_6	1.000	.743
reason_7	1.000	.690
reason_8	1.000	.668
reason_9	1.000	.700
reason_10	1.000	.811
reason_11	1.000	.681
reason_12	1.000	.675
reason_13	1.000	.728
reason_14	1.000	.744
reason_15	1.000	.718
reason_16	1.000	.903
reason_17	1.000	.850
reason_18	1.000	.837
reason_19	1.000	.831
reason_20	1.000	.808
con.1	1.000	.673
con2	1.000	.788
con3	1.000	.758
con4	1.000	.687
exp1	1.000	.637
exp2	1.000	.701
exp3	1.000	.723
risk1	1.000	.730
Risk2	1.000	.835
Risk3	1.000	.730
Org_risk1	1.000	.720
Org_risk2	1.000	.735

Org_risk3	1.000	.728
Org_risk	1.000	.761
info_1	1.000	.716
info_2	1.000	.746
info_3	1.000	.753
info_4	1.000	.693
memory_1	1.000	.769
memory_2	1.000	.713
memory_3	1.000	.787
memory_4	1.000	.778
goal_1	1.000	.827
goal_2	1.000	.873
goal_3	1.000	.863
structure_1	1.000	.690
structure_2	1.000	.770
structure_3	1.000	.792
structure_4	1.000	.769
structure_5	1.000	.755
ostructure_6	1.000	.684
flexibility_1	1.000	.662
flexibility_2	1.000	.718
flexibility_3	1.000	.694
flexibility_4	1.000	.719
flexibility_5	1.000	.741
flexibility_6	1.000	.743
flexibility_7	1.000	.738
flexibility_8	1.000	.719
flexibility_9	1.000	.747
flexibility_10	1.000	.818
flexibility_11	1.000	.742
flexibility_12	1.000	.782
flexibility_13	1.000	.699
Performance_1	1.000	.772
Performance_2	1.000	.822
Performance_3	1.000	.729
Performance_4	1.000	.777
Performance_5	1.000	.754

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18.377	23.866	23.866	18.377	23.866	23.866	8.687	11.281	11.281
2	7.062	9.171	33.038	7.062	9.171	33.038	6.218	8.076	19.357
3	4.715	6.124	39.161	4.715	6.124	39.161	4.792	6.223	25.580
4	3.553	4.615	43.776	3.553	4.615	43.776	4.118	5.348	30.928
5	2.710	3.519	47.296	2.710	3.519	47.296	3.965	5.150	36.078
6	2.597	3.372	50.668	2.597	3.372	50.668	3.816	4.955	41.033
7	2.384	3.096	53.764	2.384	3.096	53.764	3.281	4.261	45.294
8	2.263	2.939	56.703	2.263	2.939	56.703	2.921	3.793	49.087
9	1.887	2.451	59.153	1.887	2.451	59.153	2.815	3.655	52.742
10	1.730	2.247	61.400	1.730	2.247	61.400	2.654	3.446	56.189
11	1.621	2.106	63.506	1.621	2.106	63.506	2.517	3.268	59.457
12	1.483	1.926	65.432	1.483	1.926	65.432	2.201	2.859	62.316
13	1.406	1.826	67.258	1.406	1.826	67.258	2.027	2.632	64.948
14	1.237	1.606	68.864	1.237	1.606	68.864	1.833	2.380	67.329
15	1.169	1.518	70.382	1.169	1.518	70.382	1.595	2.072	69.401
16	1.138	1.478	71.860	1.138	1.478	71.860	1.448	1.880	71.281
17	1.112	1.444	73.304	1.112	1.444	73.304	1.392	1.808	73.089
18	1.051	1.365	74.670	1.051	1.365	74.670	1.217	1.581	74.670
19	.963	1.251	75.921						
20	.920	1.195	77.116						
21	.889	1.155	78.271						
22	.847	1.100	79.371						
23	.778	1.010	80.381						
24	.764	.992	81.374						
25	.749	.973	82.346						
26	.737	.957	83.304						

27	.700	.910	84.213					
28	.644	.836	85.050					
29	.624	.810	85.859					
30	.592	.769	86.628					
31	.555	.721	87.350					
32	.522	.678	88.028					
33	.496	.645	88.672					
34	.481	.625	89.298					
35	.462	.599	89.897					
36	.456	.593	90.490					
37	.436	.566	91.056					
38	.414	.537	91.593					
39	.384	.499	92.092					
40	.379	.492	92.584					
41	.373	.484	93.068					
42	.333	.433	93.501					
43	.326	.423	93.924					
44	.301	.390	94.314					
45	.285	.370	94.684					
46	.277	.359	95.043					
47	.264	.343	95.386					
48	.256	.332	95.718					
49	.249	.324	96.041					
50	.230	.299	96.340					
51	.220	.286	96.626					
52	.212	.275	96.900					
53	.204	.265	97.166					
54	.172	.223	97.389					
55	.171	.222	97.610					
56	.167	.217	97.827					

57	.156	.202	98.029					
58	.145	.189	98.218					
59	.135	.175	98.394					
60	.127	.165	98.559					
61	.119	.155	98.714					
62	.112	.145	98.859					
63	.105	.136	98.995					
64	.094	.122	99.117					
65	.085	.111	99.227					
66	.083	.108	99.335					
67	.075	.097	99.432					
68	.072	.093	99.526					
69	.062	.081	99.606					
70	.056	.072	99.679					
71	.054	.070	99.748					
72	.050	.064	99.813					
73	.034	.044	99.856					
74	.032	.042	99.898					
75	.030	.039	99.937					
76	.028	.037	99.974					
77	.020	.026	100.000					

Extraction Method: Principal Component Analysis.

Rotated Component Matrix(a)

	Component																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
flexibility_10	.783																		
flexibility_5	.779																		
flexibility_8	.774																		
flexibility_9	.757																		
flexibility_4	.744																		
flexibility_11	.724																		
flexibility_7	.686																		
flexibility_12	.663																		
flexibility_3	.638																		
flexibility_6	.587																		
flexibility_2	.581																		
flexibility_13	-.540																		
flexibility_1	.450																		
reason_10		.841																	
reason_6		.803																	
reason_5		.797																	
reason_7		.755																	
reason_9		.717																	
reason_2		.677																	
reason_8		.664																	
reason_14		.593																	
reason_12		.527																	
reason_1		.523																	
reason_4		.520																	
memory_4			.759																
memory_3			.696																

Component Transformation Matrix

Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	.620	.259	.346	.277	.089	.107	.295	.219	.167	.226	.213	.154	.155	.157	.009	-.004	-.001	.023
2	-.087	.751	-.182	-.197	-.107	.516	.044	-.138	-.084	-.085	-.112	-.017	-.022	.061	.054	.134	.021	.077
3	.238	-.168	-.431	-.366	.599	.103	.115	-.331	.173	.089	.103	.154	.134	.037	.056	-.054	.063	-.045
4	-.181	.069	.264	.156	.719	.063	-.044	.279	-.299	-.268	-.175	-.192	.066	.045	.124	.131	-.006	.011
5	-.300	-.067	-.400	.698	.039	.198	.207	.000	.334	-.028	.019	.080	-.003	-.034	.227	-.001	-.052	.029
6	-.230	.549	-.085	.080	.187	-.679	.008	-.104	.067	.051	.220	.108	.050	-.052	-.140	-.167	-.025	-.063
7	-.510	-.072	.422	-.131	.131	.257	.233	-.140	.207	.409	.163	.000	-.180	.132	-.238	-.010	-.014	-.195
8	.065	.127	.119	-.086	.093	.037	-.449	.119	.627	.096	-.042	-.395	-.077	-.283	.186	-.091	.200	.062
9	-.107	-.025	-.069	.151	-.035	.107	-.432	-.069	-.352	.416	.445	-.052	.371	.055	.191	.158	.237	-.003
10	-.184	-.015	-.036	-.199	-.022	.081	-.133	.395	.226	.014	-.065	.340	.546	-.198	-.207	.188	-.395	.037
11	-.008	.005	.296	.136	-.005	-.108	-.288	-.431	.187	-.070	-.425	.446	.120	.274	.134	.233	.178	-.030
12	-.193	-.038	.166	-.276	-.080	.004	.079	.198	.085	-.367	.424	.357	-.083	.095	.512	-.156	.175	.154
13	.076	.026	.049	.174	.136	.261	-.283	.011	-.186	-.021	.037	.485	-.299	-.479	-.281	-.321	.144	-.040
14	.110	.038	-.138	-.024	.088	-.068	-.296	.154	.015	.163	.137	.152	-.567	.183	.169	.390	-.463	-.153
15	-.070	.043	-.241	-.116	-.027	-.086	.084	.501	-.059	.356	-.397	.165	-.060	.186	.122	-.141	.418	-.304
16	.036	.050	.132	-.004	-.056	.077	-.042	-.166	-.108	.045	-.119	-.052	.182	-.100	.433	-.464	-.441	-.519
17	.005	-.012	-.119	.077	.006	.151	-.354	.111	.121	-.258	.125	-.076	.053	.644	-.355	-.405	-.057	-.077
18	.070	.008	-.023	.026	-.069	.027	.048	.019	.106	-.383	.230	-.057	.062	-.136	-.146	.364	.264	-.725

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.