

**STRATEGY BY PROTOTYPING FRAMEWORK FOR
SMEs THROUGH INTEGRATING DESIGN THINKING
AND BALANCED SCORECARD**

**By
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**Thesis Submitted to
Othman Yeop Abdullah Graduate School of Business,
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in Fulfilment of the Requirement for the Degree of Doctor of Management**



Kolej Perniagaan
(College of Business)
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ABSTRACT

The purpose of this research is to study the integration of two management concepts, Design Thinking (DT) and the Balanced Scorecard (BSC), for business strategy. Through Action Research (AR), DT and BSC were used to assist the selected case company from the ICT industry implement its strategic change agenda over a planning period of three years to achieve new growth by increasing its innovation capability. Seven major AR cycles are reported in this study that covers both the problem solving part and the new knowledge generation part of the research. Each AR cycle consists of the five stages of diagnosis, planning, action, evaluation and learning. The learning from the AR cycles were generalized to develop a framework for strategy development and implementation for SMEs that addresses many of the current issues related to managing strategy for SMEs.

The results show that integrating DT practices with the BSC helped the case company successfully implement its innovation driven growth strategy. The learning through action was rigorously compared and supported with the academic literature. The lessons were generalized to create the DT-BSC Process Framework for business strategy development and implementation. The core concept underlying the proposed framework is ‘strategy by prototyping’ that is presented through a visual template.

The practical knowledge contribution from this research is the development of a process framework that will allow SME owners and managers to create and implement their own innovation driven strategies. The framework integrates some established best practices from business strategy management with the innovative practices of designers into a series of practical and simple steps. The ‘strategy by prototyping’ concept and visual template articulated from the findings of this research may contribute a new paradigm in the field of business strategy.

Keywords: action research, business strategy, design thinking, balanced scorecard, SME, prototyping

ABSTRAK

Penyelidikan ini bertujuan mengkaji gabungan dua konsep pengurusan *Design Thinking* (DT) dan *Balanced Scorecard* (BSC), untuk strategi perniagaan. Melalui kaedah *Action Research* (AR), DT dan BSC digunakan untuk membantu syarikat daripada industri ICT yang dikaji melaksanakan agenda perubahan strategiknya selama tempoh perancangan tiga tahun bagi tujuan menjana pertumbuhan dengan meningkatkan daya inovasi syarikat. Tujuh kitaran utama AR dilaporkan dalam kajian ini yang merangkumi bahagian penyelesaian masalah dan bahagian penyelidikan untuk menjana sumbangan ilmu baharu. Setiap kitaran AR terdiri daripada lima peringkat iaitu diagnosis, perancangan, tindakan, penilaian dan pembelajaran. Pembelajaran daripada pengalaman syarikat digunakan untuk membangunkan rangka proses kerja bagi menggubal dan melaksanakan strategi untuk industri kecil dan sederhana (IKS) yang turut menangani isu-isu semasa yang berkaitan pengurusan strategi untuk IKS.

Hasil kajian menunjukkan bahawa syarikat contoh telah berjaya menggabungkan amalan DT dengan BSC untuk melaksanakan strategi pertumbuhan syarikat berasaskan inovasi tersebut. Pembelajaran daripada pengalaman tunggal ini dikukuhkan melalui perbandingan yang teliti dengan kajian akademik terkini. Pembelajaran ini kemudiannya diumumkan menjadi rangka kerja DT-BSC untuk menggubal dan melaksana strategi perniagaan. Konsep asas yang menjadi tunjang rangka kerja DT-BSC ialah ‘strategi melalui prototaip’ yang dikemukakan menggunakan kerangka visual.

Sumbangan ilmu berbentuk praktikal daripada penyelidikan ini ialah pembangunan proses rangka kerja yang membantu pemilik dan pengurus IKS menggubal dan melaksana strategi yang didorong inovasi mereka sendiri. Rangka kerja ini menggabungkan beberapa amalan terbaik dari pengurusan strategi perniagaan dengan amalan inovatif para pereka ke dalam satu siri langkah-langkah yang praktikal dan mudah. Konsep ‘strategi melalui prototaip’ yang diungkapkan daripada penemuan penyelidikan ini berpotensi menyumbangkan suatu paradigma baharu dalam bidang ilmu strategi perniagaan.

Kata kunci: *action research*, pengurusan strategi, *design thinking*, *balanced scorecard*, IKS, prototaip

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I am very thankful to all the staff and managers at Encoral Digital Solutions Sdn. Bhd. for helping me learn in the journey of business, especially in working to implement the new strategy that is the subject of this research.

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... Allah will raise those who have believed among you and those who were given knowledge, by degrees ... (Al-Quran, 58:11)

TABLE OF CONTENTS

	Page
CERTIFICATION OF THESIS WORK.....	ii
PERMISSION TO USE	iv
ABSTRACT	v
ABSTRAK	vi
ACKNOWLEDGEMENTS	vii
TABLE OF CONTENTS.....	viii
LIST OF TABLES	xiii
LIST OF FIGURES	xiv
LIST OF ABBREVIATIONS.....	xvii
CHAPTER ONE - INTRODUCTION	1
1.1 Journey in Entrepreneurship.....	2
1.2 Journey in Strategy Management	5
1.3 The Innovation Challenge	5
1.4 Problem Statement.....	7
1.4.1 Formal Problem Statement	10
1.4.2 Research Questions	11
1.4.3 Research Objectives	11
1.4.4 Significance and Relevance of the Research.....	12
1.4.5 Scope of the Study.....	13
1.5 Summary of the Research Strategy	14
1.6 Outline of this Thesis.....	17
1.7 Research Limitations	18
1.8 Conclusion.....	19
CHAPTER TWO - LITERATURE REVIEW	20
2.1 Business Strategy Overview.....	20
2.1.1 Working Definition of Strategy	24
2.1.2 Customer Value Proposition.....	27

2.1.3	Resource Based View of Strategy (RBV)	29
2.1.4	Competencies and SME Strategy Development	36
2.1.5	SME and Strategy Management	38
2.1.6	Strategy Management Must Be Simple for SMEs	43
2.2	Balanced Scorecard	45
2.2.1	Summary on the Evolution of BSC	45
2.2.2	Summary of BSC and SFO	47
2.2.3	BSC Criticisms	56
2.2.4	BSC Criticisms: Problems Related to Implementation Period	62
2.2.5	BSC Criticisms: Problems Related to Measures	64
2.2.6	Use of BSC for SMEs	65
2.2.7	BSC Evolution and Adaptation	67
2.2.8	Integrating BSC With Other Management Tools	70
2.3	Design Thinking	72
2.3.1	Innovation not Invention	72
2.3.2	Innovation Can and Must Be Managed	74
2.3.3	Definition of Design	77
2.3.4	Design: Key Component of Innovation	78
2.3.5	DT Popularity	79
2.3.6	Design Thinking (DT) Defined	80
2.3.7	Benefits of Design Thinking for Businesses	85
2.3.8	Integrating DT and Other Management Models	90
2.3.9	DT Practices and Tools	97
2.3.10	Differentiating Design from DT	104
2.3.11	DT Criticisms	107
2.3.12	Examples of the Use of DT in SMEs	108
2.4	Brief on SMEs and the Malaysian SME Landscape	112
2.4.1	Defining and Understanding SMEs	113
2.4.2	Malaysian SME Sector	117

2.4.3	Malaysia SME Master Plan	118
CHAPTER THREE - METHODOLOGY		124
3.1	Research Design	125
3.1.1	AR Steps or Stages	127
3.1.2	The Action Research Spiral	128
3.1.3	Developing an AR Guide and Checklist	131
3.2	Justification for the Methodology	133
3.3	The Unit of Analysis and Sources of Data	136
3.3.1	Data Analysis	138
3.4	Procedures Used to Collect Data	139
3.5	Limitations of the AR Method	140
3.6	Ethical Issues	142
CHAPTER FOUR - RESULTS AND DISCUSSIONS		143
4.1	AR Cycles Related to the Research Problem	143
4.2	Results Summary from Cycles 1 Through 4	153
4.2.1	Detailed Results on the E-Book ‘White Space’ Prototype	154
4.3	Addressing the Research Question in Cycle 5	164
4.3.1	Cycle 5 Summary Table	164
4.3.2	Developing the Model Used in Cycle 5	166
4.4	Completing the Research Question in Cycle 6	173
4.4.1	Cycle 6 Summary Table	173
4.4.2	DT-BSC Process Framework	174
4.4.3	DT-BSC Process Framework and the Research Question	191
4.5	The Final AR Cycle	194
4.5.1	Cycle 7 Summary Table	194
4.6	Additional Discussion on DT-BSC Process Framework	196
4.7	Strategy by Prototyping	203
4.8	Comments Related to the Research Objectives and Other Research Issues ..	207
4.9	Some Practice Notes on DT	210

4.9.1 DT and Core Competencies.....	210
4.9.2 DT and Costs	213
4.10 Critical Success Factors.....	214
CHAPTER FIVE - CONCLUSIONS AND RECOMMENDATIONS	219
5.1 Introduction	219
5.2 Conclusions	219
5.2.1 Conclusions About the Research Problem	219
5.2.2 Conclusions About the Research Question	222
5.3 Managerial, Policy and Theoretical Contributions.....	226
5.3.1 Contribution to the Limited Studies on the Use of BSC by SMEs	226
5.3.2 Contribution to the Limited Studies on the Use of DT by SMEs.....	227
5.3.3 Contribution to Studies on the Use of DT for Business Strategy	228
5.3.4 Implications for Theory	229
5.3.5 Implications for Policy and Practice.....	232
5.4 Limitations.....	235
5.5 Reflections on the Methodology	236
5.6 Implications for Further Research	239
5.7 Final Remarks.....	240
REFERENCES.....	243
APPENDIX A	276
A.1.1 The Case Company and the Researcher's Journey in Entrepreneurship.....	276
A.2.1 Sample List of Technical Action Research Projects	278
A.3.1 Action Research in Brief.....	280
Origins of AR	280
Defining AR	281
Types of AR	284
Other Characteristics of AR	286
Summary on AR.....	288
A.3.2 Kurt Lewin on Action Research.....	289

A.3.3 Seven Part Structure for AR Analysis.....	291
Perry & Zuber-Skerritt Checklist	292
A.3.4 OSM Certificate	293
A.3.5 Selected Pictures from Cycle 1	294
A.3.6 Selected Pictures from Cycle 2	297
A.3.7 Selected Pictures from Follow-up to Cycle 3	300
A.3.8 Selected Pictures from Cycle 4	301
A.4.1 Strategic Outcomes Annual Results.....	303
A.4.2 e-Book Roadmap.....	304
A.4.3 Sample Customer Co-Creation Activity	305
A.5.1 Organizational Chart	306
A.5.2 Project Panels	307
APPENDIX B	309
B.1.1 Visuals of Latest Prototypes for 2014	309
B.1.2 Visuals of Book Titles in Amazon.com	311

LIST OF TABLES

Table	Page
Table 2.1 Framework on the Common Elements of DT (Hassi & Laakso, 2011)..	83
Table 2.2 Comparing Business and Design Thinking (Liedtka & Ogilvie, 2011)	106
Table 2.3 SME Categories in Malaysia (www.smecorp.gov.my/v4/node/14)	118
Table 3.1 Types of AR (Zuber-Skerritt & Perry, 2002).....	126
Table 4.1 Summary Documentation of Cycle 1	145
Table 4.2 Summary Documentation of Cycle 2.....	147
Table 4.3 Summary Documentation of Cycle 3.....	148
Table 4.4 Summary Documentation of Cycle 4.....	151
Table 4.5 Timeline for Apple apps	161
Table 4.6 Summary Documentation of Cycle 5.....	165
Table 4.7 Summary Documentation of Cycle 6.....	173
Table 4.8 DT-BSC Integration Summary	191
Table 4.9 DT-BSC Framework Addressing Issues Related to Strategy and SME	192
Table 4.10 Summary Documentation of Cycle 7.....	195
Table 4.11 Addressing the Basic Components of Strategy.....	198
Table 4.12 Supporting and Relating the DT-BSC Process Steps to the Literature.	199
Table 4.13 Summary of Related Research Issues	207
Table A.1 Types of AR and Their Main Characteristics	285
Table A.2 Selected Financial Data From The Firm	303
Table A.3 Product Roadmap	304

LIST OF FIGURES

Figure	Page
Figure 1.1 Proposed Research Area.....	1
Figure 1.2 Summary of The Firm's Mission, Values, Vision and Older Strategy	4
Figure 1.3 Firm's Strategy Map 2005	4
Figure 1.4 5 AR Stages Used in this Research	16
Figure 1.5 7 Major AR Cycles	17
Figure 2.1 White Space Concept.....	22
Figure 2.2 10 Strategy Schools	22
Figure 2.3 Researcher Summary of a Working Definition of Strategy	24
Figure 2.4. Value Gap and Strategy.....	25
Figure 2.5 Three Customer Value Propositions.....	28
Figure 2.6 Generic Strategies, CVP and Strategy Techniques (Palladium, 2010)..	28
Figure 2.7 Hierarchy of Resources, Capabilities and Competencies.....	30
Figure 2.8 Mapping Competencies With Markets	33
Figure 2.9 Gap in SME Frameworks (Taticchi, Tonelli & Cagnazzo, 2010).....	42
Figure 2.10 BSC From Performance Measurement to Strategy Implementation	46
Figure 2.11 Purpose and Definition of the BSC (Kaplan & Norton, 1996).....	47
Figure 2.12 Summary of the BSC Framework (Kaplan & Norton, 1996).....	48
Figure 2.13 BSC Cause and Effect Relationship	51
Figure 2.14 Strategy Map on Managing Customers (Kaplan & Norton, 2004).....	52
Figure 2.15 Summary of BSC Components.....	54
Figure 2.16 Adaptations of the Strategy Map (Kaplan & Norton, 2004)	61
Figure 2.17 Unconventional Strategy Map (Field, 2011)	70
Figure 2.18 Inventions With No Guarantee of Revenue.....	73
Figure 2.19 Design Driven Innovation (Verganti, 2009).....	74
Figure 2.20 Design as Magic? (Liedtka & Ogilvie, p.3).....	76
Figure 2.21 Design as a Manageable Process (Liedtka & Ogilvie, 2011, p. 21)	77
Figure 2.22 Two Discourses on Design (Hassi & Laakso, 2011).....	82
Figure 2.23 DT for Business Strategy Generates Greatest Value (Fraser, 2007)	88
Figure 2.24 How Design Creates Value (Borja de Mozota, 2006a)	90
Figure 2.25 Design Management Staircase (Koostra, 2009)	94
Figure 2.26 Simple Prototyping With Colored Paper and Tapes.....	99

Figure 2.27 Visualizing and Prototyping Using 3D Lego Sets.....	100
Figure 2.28 Sample Mind Map (http://en.wikipedia.org/wiki/Mind_map)	101
Figure 2.29 Growth Levers for SMEs (SME Plan, 2012, Chart 4.2).....	119
Figure 2.30 Summary of SME Masterplan (SME Plan, 2012, Chart 5.1)	120
Figure 2.31 High Value Activities (SME Plan, 2012, Chart 3)	121
Figure 3.1 AR Stages Used in this Study.....	126
Figure 3.2 7 Major AR Cycles	132
Figure 4.1 Growth in Selected Financial Outcome Measures	153
Figure 4.2 Yearly Summary of Total Number of Downloads per App	156
Figure 4.3 Most Recent Monthly Summary of the Total Number of Downloads	157
Figure 4.4 Percent Downloads of Apps per Country 2011	157
Figure 4.5 Percent Downloads of Apps per Country 2012	158
Figure 4.6 Facebook Fans From Top 7 Countries (Aug 2012 - Apr 2013)	159
Figure 4.7 Change Achieved After the Planning Period (2010 - 2013).....	160
Figure 4.8 Key Components of the Classical BSC Framework.....	169
Figure 4.9 Achieving Strategic Objectives Through Actionable Initiatives.....	170
Figure 4.10 Adaptation of the Strategy Map.....	170
Figure 4.11 New Strategy Visual.....	171
Figure 4.12 Project Template for One of the Selected Initiatives.....	172
Figure 4.13 Template to Monitor the Portfolio of Strategic Initiatives	172
Figure 4.14 DT-BSC Process Framework	175
Figure 4.15 Mission, Vision and Values Define the Core Purpose	176
Figure 4.16 Broad Strategic Change Agenda.....	177
Figure 4.17 Strategic Change Agenda to Clarify Vision and Areas of Change.....	177
Figure 4.18 Core Purpose and Strategic Outcomes	178
Figure 4.19 Guidelines for Generating Ideas	179
Figure 4.20 Use of Simple Voting Technique for Feedback	180
Figure 4.21 Divergent Ideas Generated	181
Figure 4.22 Closing the Revenue Gap	181
Figure 4.23 Selected List of Workable Ideas From Cycles 1 and 2.....	183
Figure 4.24 Template to Map Change Agenda With Tangible Ideas	183
Figure 4.25 Formal Processes Related to Initiatives (Kaplan & Norton, 2008)	185
Figure 4.26 New Visual Strategy Template.....	186
Figure 4.27 Simple Visual on Progress of the Strategic Prototypes	190

Figure 4.28 Feedback Form	196
Figure 4.29 Comparison With Palladium Strategy Management Process	202
Figure 4.30 Results From Google Search	207
Figure 5.1 DT-BSC Framework Contribution to Strategy Thought	230
Figure A.1 Collaborative History Notes Using the Timeline Technique	294
Figure A.2 Sample 2x2 Matrices Used in Cycle 1.....	294
Figure A.3 Voting Done by Other Participants on the Outcome	295
Figure A.4 Initial List of Projects From Innovation Day 2010.....	295
Figure A.5 Simple Project Plan for One of the Selected Projects.....	296
Figure A.6 Highlighting the Major Strategic Themes	297
Figure A.7 Timeline Output from Cycle 2.....	298
Figure A.8 Cascading Overall Revenue Target by Department	298
Figure A.9 Project Plan for a New Product	299
Figure A.10 E-book Portal and Printed Versions of Selected E-book Titles.....	300
Figure A.11 Showing One of the Mobile Applications	300
Figure A.12 Teams Collaborate to Prototype Ideas Into Simple Models	301
Figure A.13 Converting Ideas From Oracle Related Business Into Prototypes.....	301
Figure A.14 Prototyping Using Lego Serious Play Tools	302
Figure A.15 Documenting the Lego Prototypes With Pictures	302
Figure A.16 Voting Activity for Customer Co-creation	305
Figure A.17 Organizational Chart.....	306

LIST OF ABBREVIATIONS

AR	Action Research
B2B	Business to Business
B2C	Business to Consumer
B2G	Business to Government
BSC	Balanced Scorecard
CVP	Customer Value Proposition
DT	Design Thinking
ICT	Information and Communication Technology
IT	Information Technology
NPD	New Product Development
PMP	Project Management Professional
RBV	Resource Based View
SFO	Strategy Focused Organization
SI	Systems Integration
SME	Small and Medium Enterprise
VAR	Vale Added Reseller

CHAPTER ONE

INTRODUCTION

This thesis follows the style guide that mixes addressing the researcher as a third person and also the first person, especially within an interpretive and narrative paradigm, based on the thesis style guide by (Perry, 1998). The researcher will use the first person only in the notes and observations of the action research cycles in Chapter Three.

The researcher has gone through a long journey as an entrepreneur, consultant and trainer in strategy management leading to his recent interest in innovation and design thinking. It has led to this stage of exploring how to combine some new management ideas related to the practice and thought processes of designers with relatively established ideas and tools in strategy management like core competencies, customer value propositions and the balanced scorecard. Of particular interest is how to apply these ideas to medium sized companies that acknowledge their need to formulate and implement some form of strategy in moving forward.

Figure 1.1 shows the research area of interest. Research at the intersection of these management ideas could contribute to new knowledge in terms of practical case studies or even perhaps a simple framework or model. Surely a strict methodological research approach along academic lines would answer some of these general questions.

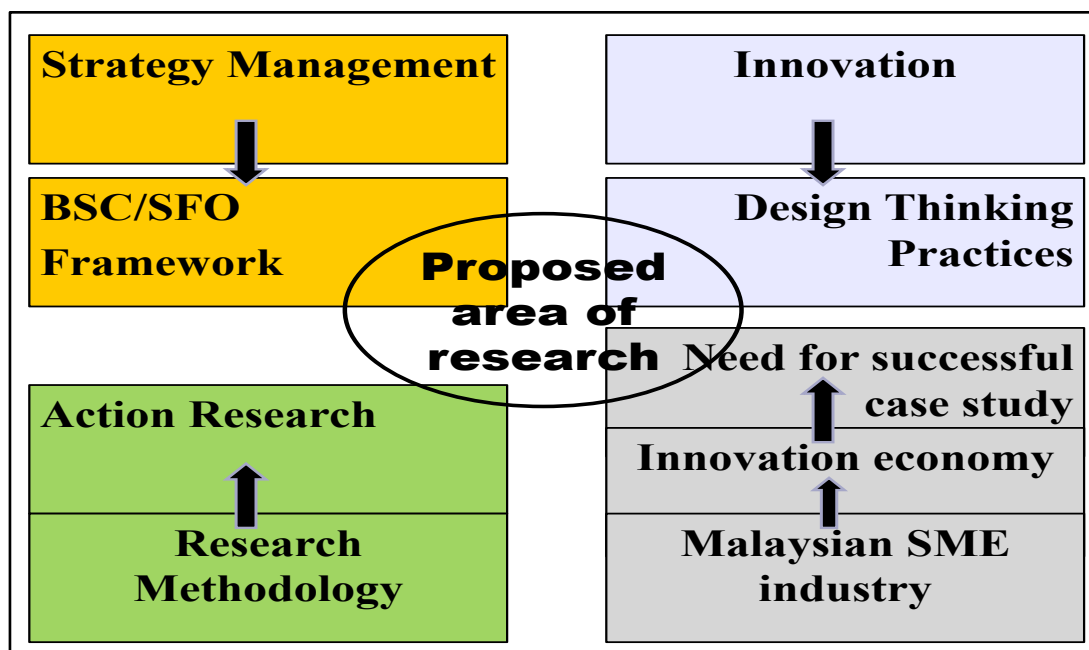


Figure 1.1
Proposed Research Area

1.1 Journey in Entrepreneurship

The researcher is aware that this is not a normal approach to introduce a formal thesis write up. Anecdotal storytelling, especially by pictures and sketches, is one of the design thinking practices (Brown, 2009, Hill, 2005). The researcher is trying to emulate this practice in this thesis that borrows some core ideas from design thinking.

Appendix A.1.1 describes the basic profile of the case company used in this research, The Firm, through a summary of the entrepreneurial beginnings of the researcher. It describes the journey from an operational focus to a strategic focus. Upon reaching the first stable phase of The Firm after about 3 years, longer-term strategic questions about the future of The Firm were raised by the founders, including the researcher. As his role moved from operations to management and The Firm looked toward him for guidance and leadership, he began to work on business strategy related ideas, tools and frameworks that can be applied to address the strategic needs of The Firm. The main ideas and thoughts that influenced him were the works by (Collins & Porras, 1994) on building lasting companies and (Hamel & Prahalad, 1996) on core competencies and capabilities. It is important for growing start-up companies to articulate their purpose beyond profits and begin to address their core purpose and unique values and culture, thus describing a character for their companies. They must also know their existing capabilities and other additional capabilities that can help them improve and be more competitive. For example, The Firm learned that although the field personnel had good technical capabilities their lack of project management capabilities resulted in many projects taking a longer time to complete resulting in higher implementation costs and delayed payments.

Although these ideas helped The Firm articulate its core purpose and list down its existing and needed capabilities, they were difficult to implement. A new project on data warehousing with a large Malaysian government-linked company (GLC) in 1999 introduced the researcher to the balanced scorecard (BSC) (Kaplan & Norton, 1996). While learning about and implementing the BSC for the GLC customer, the researcher began to apply the BSC within The Firm. He could see a marked improvement in the communication and understanding of strategy within The Firm. The mission, values and capabilities can now be related to operations and training. The Firm thought that its customer value proposition (Treacy & Wiersma, 1997) was

‘operational excellence’ but learned that it was better to adopt a ‘customer intimacy’ value proposition. It was also easier to monitor the implementation of strategy. Many of the qualitative improvements brought about by the use of the BSC are actually confirmed in the many books and academic papers on the BSC (Kaplan & Norton, 1992, 1993, 1996, 2000). This practical experience with the BSC launched a new business segment for The Firm on BSC training and consulting. It also helped launch a new and profitable capability for The Firm on strategy management. From this experience, the researcher reflects that many entrepreneurs realize that they need a strategy to compete beyond the initial growth phase of their companies. Time, resource and funding constraints normally force them to grow internal resources to develop and implement their strategies since engaging external help may be too expensive. The best is for the founder entrepreneur to lead the strategy effort since studies have shown that leadership commitment is a paramount principle in successful strategy implementation (Kaplan & Norton, 2000).

Figure 1.2 is a later version of The Firm’s mission, vision and value statements. The Firm is proud to have a unique core purpose as reflected in the mission statement that certainly goes beyond profits and other tangible benefits. The five values map to the word CORAL and the name enCORAL in ‘enCoral Digital Solutions Sdn Bhd’ means to enable the five CORAL values. ‘Digital’ reflects the core business of The Firm in information and communications technology (ICT). ‘Solutions’ reflects that The Firm adopts a basic ‘customer intimacy’ value proposition.

Figure 1.3 is the strategy map developed in 2005. In addition to the earlier references by (Collins & Porras, 1994), (Treacy & Wiersma, 1997), (Kaplan & Norton, 1996, 2000, 2004), this version of the strategy was greatly influenced by the ambition to grow The Firm from a good company to become a great company (Collins, 2001) and lay the foundations to become a “great and lasting global ICT company”. The strategy map was developed to conform to the standard BSC strategy map framework (Kaplan & Norton, 2004). The Firm grew steadily based on the strategy articulated in 2005 and continued with the same basic strategy well into 2010 with continued incremental success.

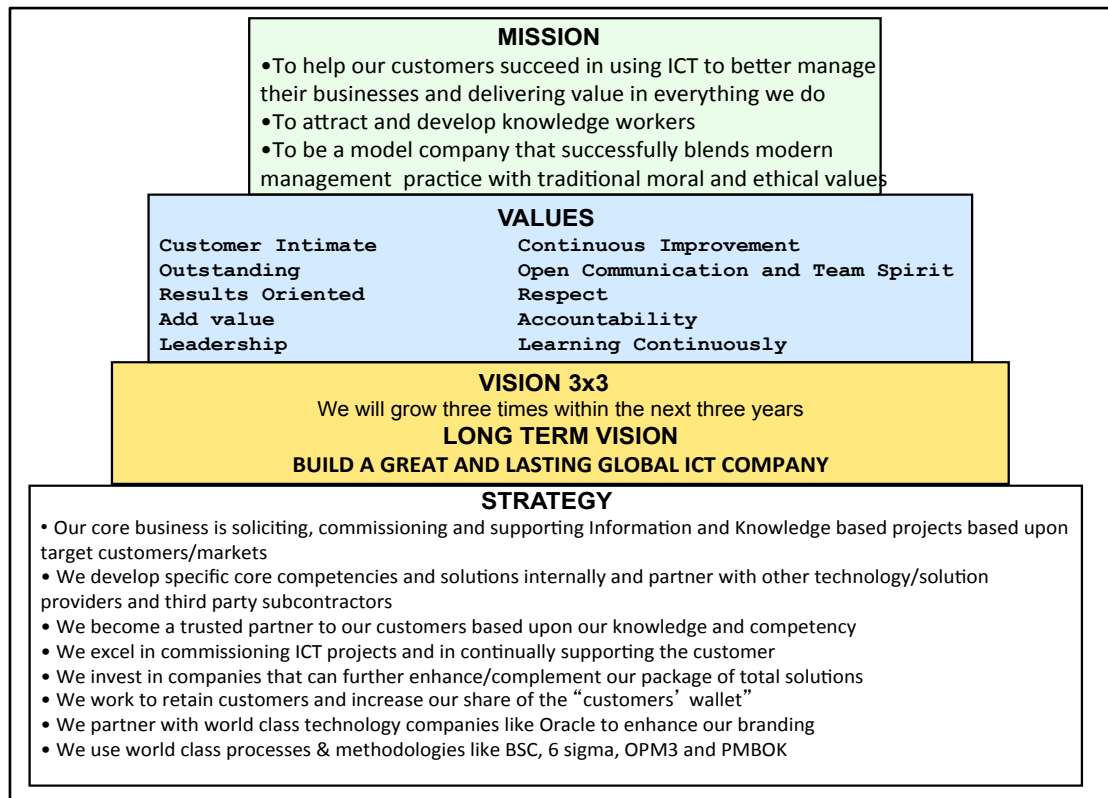


Figure 1.2
Summary of The Firm's Mission, Values, Vision and Older Strategy

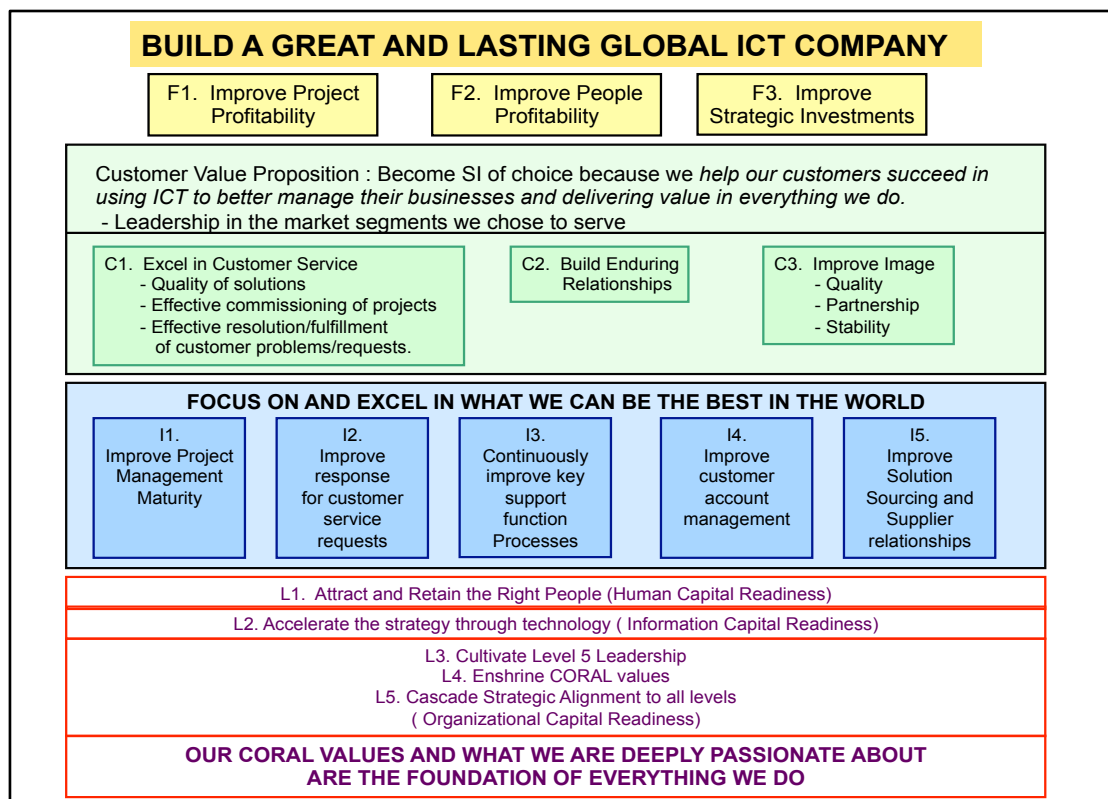


Figure 1.3
Firm's Strategy Map 2005

1.2 Journey in Strategy Management

At this juncture, the researcher would like to narrate his learning experiences in strategy management training and consulting. As mentioned earlier, the experiences The Firm gained while implementing the BSC helped The Firm acquire a new and profitable capability in strategy management. This capability created a new business opportunity in training, consulting and software implementation for companies and government organizations wanting to implement the BSC. This affirmed the view that building capabilities not only help companies enhance their current products, services and customer segments but also open up new business opportunities.

Appendix A.2.1 lists a sample of strategy related projects that the researcher has commissioned. It has certainly enriched the researcher's practical knowledge of strategy management across various industries and geographies.

The key lesson from this experience is that entrepreneurs and entrepreneurial companies can always **grow sustainably by building new capabilities and competencies**. These can be acquired by nurturing a culture of practical learning within the company and the courage to try new ideas.

1.3 The Innovation Challenge

As The Firm entered the new decade in 2010, the researcher realized that The Firm needed a new growth path, something like a 'white space' that goes beyond the current market and customer segments by leveraging on the current capabilities (Hamel & Prahalad, 1996). The Firm has somewhat experienced this before with the BSC. A casual look at the strategy map does not show any role of innovation in The Firm's strategy. The Firm had many committed customers that signed maintenance contracts and awarded new projects thus reflecting the relative success of its customer intimacy strategy (Treacy & Wiersma, 1997). The key project management capability significantly improved project delivery and customer satisfaction. A major 'white space' opportunity requires a new innovation capability. Denning (2010) commented that creating an institutional capability to generate continuous innovation and organizational learning is not a matter of adding something on to the existing management system. Rather it involves re-thinking the fundamentals of how an organization is organized and managed. In short, it requires a strategic renewal agenda, "the potential to substantially affect long-term prospects

of a company, the refreshment or replacement of attributes of an organization and aims to provide a foundation for future growth and development” (Agarwal & Helfat, 2009, p. 282).

The researcher studied the business magazines and management books for new management ideas related to innovation. A recent trend in the United States that was soon followed in Europe was the attempt by top universities to offer both business-based and design-based programs that integrate the best of both methodologies and cultures counting about 39 masters and MBA programs that significantly integrate design and business (BusinessWeek, 2009). It is based on a simple idea that since design makes a significant value contribution to physical objects and tangible products, the practices and thought processes of designers should benefit businesses at large, particularly in increasing the level of innovation in organizations. The concept of ‘design thinking’ was introduced and promoted by professionals (Brown, 2009) and academicians (Martin, 2009; Liedtka & Ogilvie, 2011). Upon further study of the above books and other related material the researcher was attracted by its underlying concept, it being a new trend and thus a chance for The Firm to adopt a new management idea. The Firm adopted the BSC when it was relatively new and managed to successfully develop a new business venture out of the learning experience. Perhaps design thinking (DT) may offer a similar opportunity. This will further enhance the entrepreneurial culture in The Firm that despite its growth and stability the founder is still enthusiastic about trying out new ideas.

The Firm’s interest in modern management ideas and tools is well enshrined as part of its mission statement, “To be a model company that successfully blends modern management practice with traditional moral and ethical values”. The journey started with principles of lasting companies (Collins & Porras, 1994), core competencies (Hamel & Prahalad, 1996), balanced scorecard (Kaplan & Norton, 1996), customer value propositions (Treacy & Wiersma, 1997), strategy focused organization (Kaplan & Norton, 2000), strategy maps (Kaplan & Norton, 2004) and now DT (Brown, 2009; Martin, 2009; Liedtka & Ogilvie, 2011). This journey is loaded with lessons from the successes and shortcomings, both major and minor.

However, the general business problem at hand is how can The Firm grow by increasing its innovation capability through the use of DT? There are only a few documented case studies on successful use of DT in businesses with the bulk of it referring to large corporations. The researcher knows from his long involvement

with the BSC that many of these management ideas and tools need to be significantly adapted for use in small and medium enterprises (SMEs). The literature on successful use of DT in SMEs is even further limited. Introducing a new management idea like DT in exploring business growth definitely invokes strategic changes in the company. The BSC is still a reliable and popular tool for strategy implementation (Rigby & Bilodeau, 2011) and the researcher is well versed with the BSC. Thus it is quite obvious to explore the integration of DT and BSC. Again the literature on this synthesis is very limited. The researcher could not find specific literature on integrating DT and BSC and then applying it in the context of an SME. This makes it an interesting research area. The next challenge is to scope the study in more specific detail by identifying the actual research problems and the specific methodologies in doing the study.

1.4 Problem Statement

As shown in Figure 1.1 and mentioned in some of the preceding paragraphs, the BSC is an important component of this research. Although the BSC is popular in large organizations (Rigby & Bilodeau, 2011), most SMEs are not aware of this technique and the usage rate is very low compared to large organizations (Tennant & Tanoren, 2005). At the same time, the BSC is believed to be as beneficial for SMEs as it is for large organizations (McAdam, 2000a; Andersen *et al.*, 2001; Kaplan & Norton, 2000). However, the literature reporting on the uses and limitations of the BSC in SMEs is rare (Rompho, 2011). Among the objectives of this study is to fill the gap by investigating the limitations of implementing the BSC in SMEs. This research will enrich the limited studies on the use of BSC by SMEs and show how the framework can be adapted to make strategy management simpler, more action oriented and less demanding on the time involved, people and material resources.

From the literature review on Design Thinking in Chapter Two, it is obvious that the space where design and strategy meets is an open, new and interesting area of research. This confirms that the research area being addressed here is current and relevant to the strategy management body of knowledge. In a recent review on design and design thinking (DT) in business and management education and development, (Matthews & Wrigley, 2011) noted that four areas of categorization emerged; Human Centered Design, Integrative Thinking, Design Management and

Design as Strategy. The comments made on the fourth category is of particular interest to this research, describing the fourth category of programs as relating design with strategy and asserting that **“this category is relatively ill-defined and largely under construction”** (Matthews & Wrigley, 2011, p. 10). Fraser (2007, 2009) also asserted that **the greatest payout of DT lies in the design of strategies and business models** for organizational performance.

Matthews and Wrigley (2011) stated that many of the current programs related to design and strategy are at the post graduate MBA and executive education level. This indicates that the body of knowledge related to strategy and DT is considered post-graduate material. With the added view that the greatest payout of DT lies in the design of strategies and business models (Fraser, 2007, 2009) this research involving DT, strategy and BSC will really make a significant contribution to current and important knowledge related to strategy management.

The works pioneered by Borja de Mozota on what she terms as ‘design management’ or integrating design as a new function in the structure that transforms the management processes of the company (Borja de Mozota, 2003, 2006a, 2006b; Borja de Mozota & Kim, 2009), confirm that design only strengthens business performance when it is the result of a well-managed process. Good design and investment in design alone will not automatically make a company more successful. The right skills are required to run an efficient and effective design process. Only then can design have a positive effect on business performance. Design management is becoming a commercial necessity, as it enables a company or organization to successfully deploy design for innovation purposes, match consumer needs, and realize benefits. When design management is an explicit part of management processes, it will have greater impact on business performance and help secure a market position for the long term.

From the cited references above it is obvious that studying the relationship of the management related ideas from design, be it design thinking or design management, with other existing strategy related frameworks and concepts, opens up new contributions to the body of knowledge of Design as Strategy or Strategy as Design. The literature review in Chapter Two shows that some work has been covered on discussing design in relation to other strategy management frameworks like design as a competitive differentiator (Porter, 1979, 1987), design as core competency (Hamel & Prahalad, 1996) and integrating design with the popular maturity models. One of

the main scholars that studied these relationships is Borja de Mozota (2003, 2006a) who was the first to write about the integration between design management and BSC, using the original first generation BSC model (Kaplan & Norton, 1992). Although this work integrating design and the BSC can be seen quoted in the work by other researchers, there has not been much follow up on this proposed concept. For the purpose of this research though, the idea of integrating design management concepts and the BSC as proposed by a prominent design scholar provides academic credibility on the approach being taken in this study.

The researcher also notes with interest the following discussion thread in the popular professional social network (LinkedIn DT, 2013) on ‘What are new exciting research directions to explore for design thinking?’ One of the respondents remarked that it involves exploring “how DT can be integrated (blended) with other frames” like Design Thinking and Scenario Thinking that includes design for multiple future scenarios and using scenarios to inform design choices. The blending of Design Thinking and Value Management was also mentioned. It shows that exploring how DT can be integrated (blended) with other management frameworks is a current and interesting area of research. Here the researcher is exploring how DT can be integrated with BSC.

Like for all management ideas and models, particularly those related to strategy, there is limited work reported in the literature on DT and SMEs (Borja de Mozota, 2006a; Borja de Mozota & Kim, 2009; Ward, Runcie & Morris, 2009; Matthews & Bucolo, 2012). This is probably due to the recent awareness of the contribution DT can make to business management (Brown, 2009; BusinessWeek, 2009; Martin 2009). The use of DT in SMEs is certainly relevant since design obviously can significantly help SMEs (Ward, Runcie & Morris, 2009). The lack of research papers that cover DT and SMEs, particularly those related to strategy, argues favourably for the relevance of this research.

Fraser (2007) writes about ‘economics of design’ versus ‘design of economics’, claiming that herein lies the opportunity to leverage design practices for both cultural change and strategic growth. The economics of design are known and confirmed: good design of products and service experiences creates satisfaction, connections, desire and value to the ultimate user, taking a commodity product like watches, jeans and even slippers, to a premium position in terms of pricing. A smart redesign of processes can also yield economic rewards through greater operational efficiencies.

Fraser (2007) further asserts that design has its highest value when applying DT to strategy and business modelling by designing the sustainable competitive advantage of a firm. By embracing design practices and mindsets, a firm can also fundamentally drive the design of economics in support of dramatic new growth strategies. Fraser (2007, p. 67) commented, **“While this is not yet a broadly embraced interpretation of ‘design’ it is one where the evidence for success is mounting. While at first this model may seem either radical or abstract, those who discover its advantages find it surprisingly intuitive and practical – just what the business world needs in the face of high-stakes complexities and change.”** This is **precisely why this action research is done since the documented knowledge on the use of design for strategy is still in its infancy. It is not yet broadly based, still relatively new and as such provides much room for study.**

This action research will also study three elements in the strategy of the case company that is of importance to SMEs in general and Malaysian SMEs in particular. The first relates to innovation following the proposal by (Corbett & Campbell-Hunt, 2002) that SMEs should focus their energy and resources on innovative products and its related niches. The second element is increasing the export component of The Firm by tapping into the growing global mobile commerce. The third element relates to capability building.

In the literature review presented in Chapter Two, the researcher discusses the importance and gaps related to research on SMEs and strategy. This research plans to address some of the gaps and issues identified. The researcher is proposing a simple but comprehensive framework for SMEs to develop and quickly implement their strategies. This framework also overcomes the many shortcomings in existing strategy development methods for use by SMEs. The researcher proposes to adapt and integrate some ideas from the BSC with DT to offer a simpler but more practical and action-oriented strategy management framework while incorporating core practices from designers to imbed the innovation element. This model will be tested and fully documented involving The Firm as a singular case study.

1.4.1 Formal Problem Statement

Sekaran (2003) has defined the problem statement as a clear statement of the question or issues that is to be investigated for finding an answer or solution.

Accordingly, this research aims to address the problem of how to successfully integrate the practices of Design Thinking and the Balanced Scorecard methodology to implement a strategic renewal agenda to consciously increase the innovation capabilities and execute the new global business strategy of a medium sized service-based company. This problem statement parallels the **‘thematic concern’** of the exploratory action research methodology used in this research, **‘New growth by increasing the innovation capability of The Firm through the use of DT’**.

1.4.2 Research Questions

The main research problem to be addressed is “How can the case company use design thinking (DT) practices and the balanced scorecard (BSC) methodology to implement a strategic renewal agenda to consciously increase the innovation capabilities and implement its new global business strategy”. This precise problem involves other related broad research questions that can potentially contribute to new knowledge.

An initial literature survey was undertaken to establish the status of current knowledge in the area of strategy management for SMEs. This survey revealed that while there has been increased attention on strategy management per se, current literature is inadequate in respect of the specific SME context. This leads to the main research question on how to develop and formulate a new, simpler and more action-oriented approach for strategy development and implementation for SMEs that integrates DT and the BSC while incorporating features that address some of the gaps and issues related to strategy and SMEs (Singh, Garg & Deshmukh, 2008; Yasin & Gomes, 2010; Rompho, 2011). The research question will address what is the new DT-BSC process framework and how SME’s can use the DT-BSC framework.

1.4.3 Research Objectives

The overall objective of this research is to ensure the executive management of the case company has an accurate understanding of how to implement the new strategic agenda and consciously increase the innovation content and capability of The Firm through DT and the BSC. The other objectives for this research, derived from the research problem and questions, are listed below:

- i. To propose a simple visual framework that may help SMEs in strategy development and implementation by overcoming some of the problems related to SMEs and strategy.
- ii. To document and study the benefits and challenges of blending Design Thinking and the Balanced Scorecard to implement a strategic renewal agenda
- iii. To document and study the results of an intervention program to consciously increase the innovation capabilities of a medium sized service-based company
- iv. To contribute lessons learned and observations in developing and implementing a new strategy management framework
- v. To contribute a successful case study that aligns with the overall vision of the Malaysian SME Master Plan of creating a new breed of SMEs that are globally competitive (SME Plan, 2012)

1.4.4 Significance and Relevance of the Research

Design Thinking (DT) is an interesting new idea in management with many fresh and open applications particularly in relation to strategy. However, because of the relative newness of design and strategy within the literature, the amount of systematic, research-based knowledge about firms engaged with this approach is limited. The BSC is a robust and detailed strategy implementation framework. The research part of the AR project attempts to study the synthesis of DT and the BSC as a new niche knowledge contribution to the fields of business strategy and design thinking in the form of a simpler and more action-oriented strategy process framework, particularly relevant for SMEs. The core component of this process framework will be a simplified visual template combining DT and strategy. The research will also provide a new case study on the implementation of the BSC and DT. It will contribute to a greater understanding of the issues affecting or driving the introduction of new management systems like BSC and DT in SMEs.

The literature reporting on the uses and limitations of the BSC in SMEs is rare (Rompho, 2011). Most SMEs are not aware of this technique and the usage rate is very low compared to large organizations (Tennant & Tanoren, 2005). This study will certainly add to the example applications of the BSC in SMEs.

Also there is limited work reported in the literature on DT and SMEs (Borja de Mozota, 2006a, Borja de Mozota & Kim, 2009; Ward, Runcie & Morris, 2009; Matthews & Bucolo, 2012). The awareness of the contribution DT can make in relation to strategy is fairly recent. This research also seeks to contribute to the knowledge about the processes of design led innovation and the benefits, challenges and impact of such interventions on the innovation activities and business performance of SMEs. This argues strongly for the relevance of this research.

Malaysia has a national strategic transformation agenda to move from a process-based to an innovation-based economy as announced in 2010. The Malaysian SME Master Plan (SME Plan, 2012) specifically supports this innovation agenda. To date, a search in the academic literature shows no documented case study of how a Malaysian company implements that transition to strategically increase its innovation content and capabilities. This study will be a starting contribution. SME Plan (2012) identified six growth levers for SMEs in Malaysia. The researcher notes that this thesis covers design-related innovation and capability building and thus addresses the innovation and human capital development levers.

1.4.5 Scope of the Study

The scope is summarized in Figure 1.1. The case study will involve one Malaysian based medium sized company in the ICT services industry. Appendix A.1.1 gives a brief summary of The Firm.

This action research will use and study the application of DT practices in a case SME for strategic renewal and new business models resulting in improved business performance using the definition of strategic renewal as the “potential to substantially affect long-term prospects of a company, the refreshment or replacement of attributes of an organization and aims to provide a foundation for future growth and development” (Agarwal & Helfat, 2009, p. 282). The scope of this research will only look into the details of the business model innovation of the Firm’s B2C mobile e-book business from its broad growth strategy. The study will also involve the use of the BSC to implement this strategic renewal effort. The integration of the practices of DT and the BSC is expected to contribute to new knowledge in the field of strategy management. The researcher seeks to develop and

propose a new, simpler and more action-oriented approach for strategy development and implementation for SMEs.

Just as an initial simple example, one of the major setbacks of the BSC is the time taken to develop and implement the BSC (Section 2.2.4). This seriously conflicts with the constraint issues faced by many SMEs and makes the BSC practically non-actionable. On the other hand, among the most attractive things about the DT practice is that “design is all about action, and business too often gets stuck at the talking stage” (Liedtka, 2011, p. 12) and as such could benefit when business strategy too often gets stuck at the discussion and planning stage. Thus the integration of ideas from the BSC and DT should help address the first research problem.

The recent dates of the publications quoted in this discussion show that the research topic of design and strategy is current. The literature on BSC has progressed greatly since 2003 whereby a third generation BSC has been discussed (Speckbacher *et al.*, 2003). This gives added encouragement to study the integration of the latest ideas in DT practices and link it with more recent knowledge on BSC knowing that an earlier effort made a significant contribution to the knowledge area of business strategy (Borja de Mozota, 2006a). Among the later components of the BSC not used in the work by (Borja de Mozota, 2006a) that will be explored in this research are the use of adaptable Strategy Maps and Strategic Initiatives, through which the researcher proposes the alternative concept of Strategic Prototypes.

Although the study involves the use of the BSC to implement the strategic renewal effort it is not a full fledged BSC implementation project, hence only simple financial outcome measures will be used to indicate success in implementing the strategy. The measures related to the other BSC perspectives will not be included. This is explained further in Section 3.3.

1.5 Summary of the Research Strategy

This research uses the Action Research (AR) methodology as explained in Chapter Three. AR is a member of the case-study family of methodologies (Dick, 2002). The unique element of AR that differentiates it from other forms of case study is the participation of the researcher. In AR the researcher is not separated from

the research case but is an intimate part. Sometimes the researcher is the driver of the research project and a management consultant, as in this research.

Zuber-Skerritt and Perry (2002) argued that AR is more appropriate than traditional research for improving practice, developing professional competencies and organizational learning. They clarified the difference between core AR that is collaborative, participatory AR aimed at practical improvement in a learning organization and thesis AR that is independent AR in preparing the thesis to demonstrate some mastery of research processes and procedures and make an original contribution to knowledge. AR has been successfully utilized as a research methodology in many academic disciplines. The view of Perry and Zuber-Skerritt (1991, 1992, 2002) that emancipatory AR is the methodology of choice for AR PhD projects in the management discipline has been widely accepted (French, 2009a, p. 199).

This research problem in integrating the BSC and DT for strategy management is rather new. In the Malaysian context there are no reference papers or case studies. About the first mainstream media news on DT in Malaysia for the business community appeared very recently (TheEdge, 2013). The researcher is also keen to research the problem in action and be engaged in the process both as a facilitator/researcher and participant. These have all the elements of emancipatory AR which is suitable for a PhD AR research (Zuber-Skerritt & Perry, 2002, p. 177).

Also the researcher is attracted to the many similarities between AR and DT. Both are action-oriented and involve learning by doing and participation. AR heavily involves collaboration between the researcher and the participants just like the collaboration between the designers and users in DT. The AR iterative cycles are similar to iterative prototypes in DT. Interestingly, DT is often associated with 'wicked' problems and AR for 'messy' research (Parkhe, 1993), where the problem gets more clearly defined as progress is made in finding the solution.

The researcher prefers both the simplicity and flexibility of the original (Lewin, 1946) phases or stages of AR as presented in a recent work on AR applied to e-commerce (Daniel & Wilson, 2004) and shown in Figure 1.4.

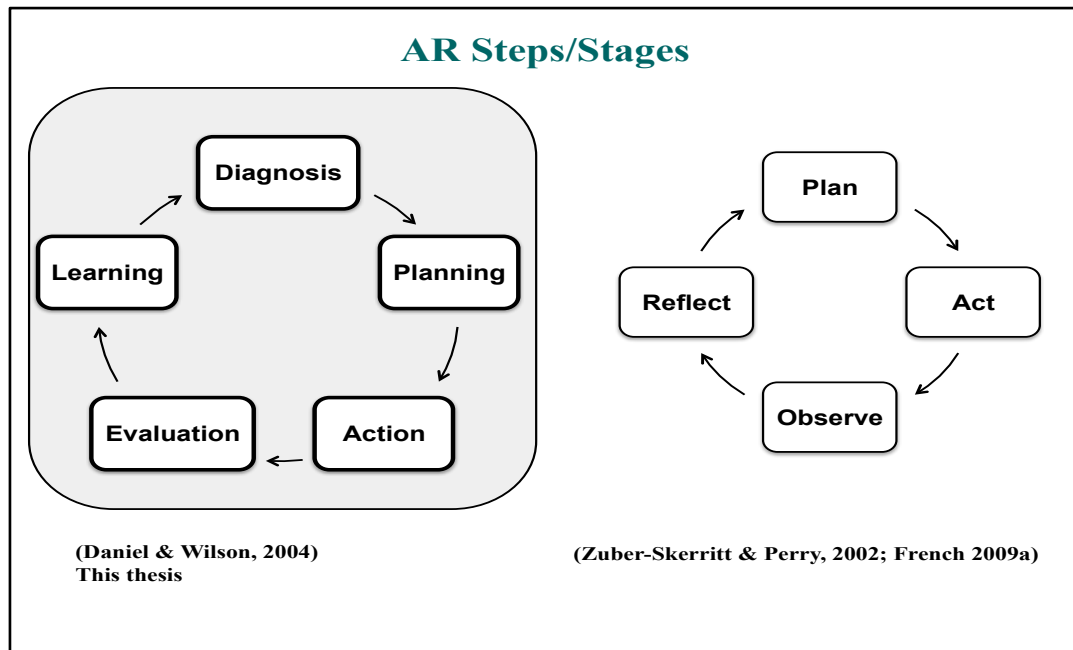


Figure 1.4
5 AR Stages Used in this Research

Figure 1.5 summarizes the seven major AR cycles used in this research. Cycles 1 through 4 are reflective (McNiff, 2002; Hill, 2005), in the sense that it took place before the formal PhD research started. It summarizes the problem solving cycles and the learning generated. From Cycle 3 onwards the awareness to convert the AR project into a PhD thesis led the researcher to relate the learning from the action to academic literature. Several minor AR cycles related to the product development and process improvement efforts are not included since it has not much significant contribution to the thesis. The researcher purposely included these main cycles to show how *Action Research for solving the research problem* evolved into *Action Research for the proposed contribution to new knowledge*; a simplified and more action-oriented process framework for strategy management for SMEs through the learning from integrating DT and the BSC.

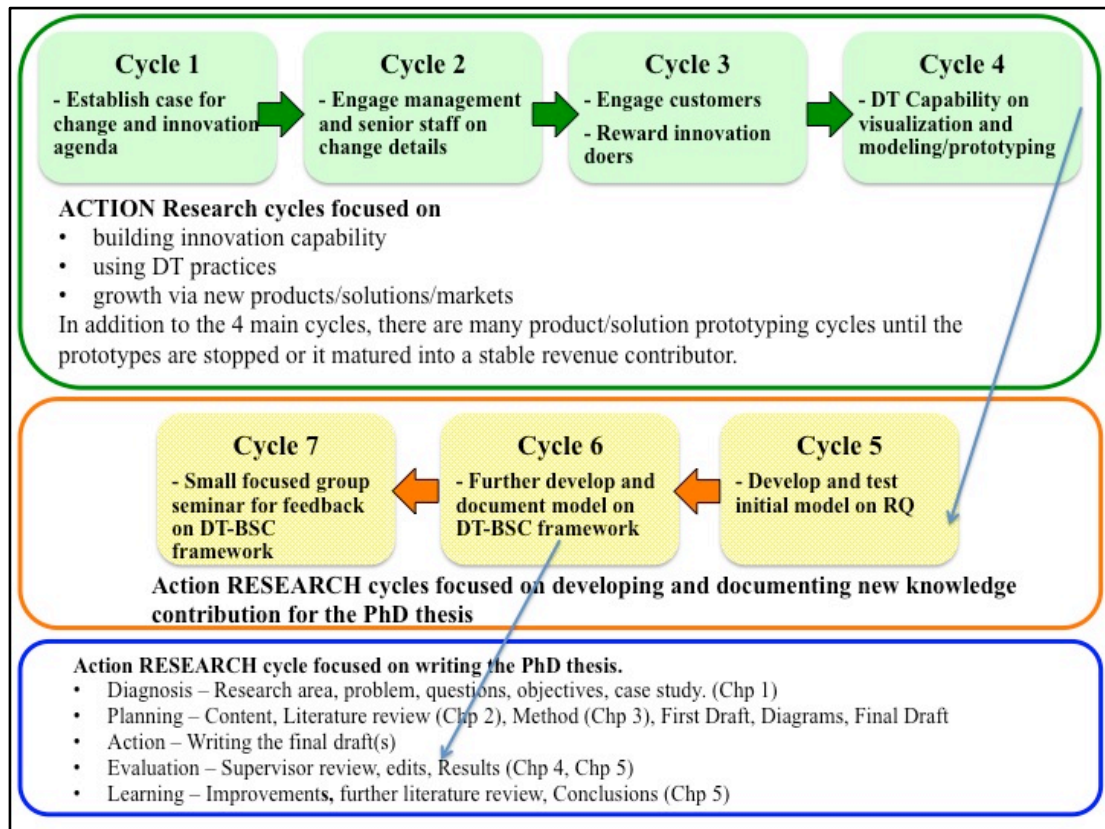


Figure 1.5
7 Major AR Cycles

1.6 Outline of this Thesis

The thesis follows the recommended structure by (Perry, 1998). After this introduction, Chapter Two presents the literature review that covers the subject matters shown in Figure 1.1.

It starts with an overview of business strategy and with a focus on the resource based view of strategy. An important aspect of the review is to highlight the core components of strategy and differentiate these from the popular techniques of strategy. Since the research question seeks to make strategy simpler for SMEs, understanding the core components will indicate the basics that SMEs need for developing and implementing strategy. This part concludes with the findings from the literature on issues faced by SMEs related to strategy that the research question tries to address.

The BSC is then presented highlighting the basic concepts and constructs. The discussion on the criticisms, evolution and adaptations of the BSC is important to provide insights on how to benefit from its strengths when using it with other management ideas and frameworks.

Chapter Two then introduces the subject of innovation as a prelude to the main subject matter on DT. This is presented in more detail since DT related to business management is relatively new. It also discusses in some detail an earlier research effort to integrate design management with the BSC, which has some similarities with this research.

Chapter Two ends with a brief discussion of the Malaysian SME sector from a strategic planning perspective to show the applied relevance of this research.

Chapter Three discusses the AR methodology in detail. It describes the various AR cycles used to generate qualitative learning for the research. As shown in Figure 1.6, the first 4 AR cycles addresses the research problem on innovation driven growth. Some measures needed to quantify the results are discussed, which can be defined as the dependent variables of the research problem.

Chapter Four presents the results related to the research problem. It also presents in detail the qualitative learning from solving the research problem that led to the remaining 3 AR cycles as shown in Figure 1.6, which addressed the research question. The DT-BSC Process Framework as a “new, simpler and more action-oriented approach for strategy development and implementation for SMEs that integrates DT and the BSC while incorporating features that address some of the gaps and issues related to strategy and SMEs” is discussed at the end of this chapter. Some of the research findings that relate to the other research objectives and issues are also presented here. The discussion in this chapter also comments on some of the issues mentioned in Chapter Two; either to confirm the previous findings, comment on new insights or mention a practice note.

Chapter Five mainly highlights the important subject of a PhD thesis, the contributions to new knowledge. The **DT-BSC Process Framework** and the concept of ‘**strategy by prototyping**’ are discussed in detail as the new knowledge contribution from the research part of this AR project.

This chapter ends by discussing some of the limitations of the research and points to implications for future research.

1.7 Research Limitations

The obvious limitation of this research is the use of a single case for the study. The literature search confirmed no reported study on the integration of DT and BSC

even for large organizations. The closest is the work on design management and the BSC (Borja de Mozota; 2003, 2006). Thus the choice of using AR based on a single company is appropriate but it remains important to continue pressing for appropriate rigor in the research. Section 4.6 and Section 4.7 is dedicated on further supporting the proposed DT-BSC Process Framework and ‘strategy by prototyping’ concept as the main contribution to knowledge of this thesis.

Thus the strengths and contributions of the research to both practice and theory as discussed in Section 5.3 remain since the limitations do not detract from them but merely provide platforms for future research.

1.8 Conclusion

This chapter laid the foundations for the thesis. It introduced the research problem, the research question and the research objectives. Then the research methodology was briefly described and justified. Finally, the thesis was outlined.

CHAPTER TWO

LITERATURE REVIEW

This second chapter aims to build a theoretical foundation upon which the research is based by reviewing the relevant literature to identify research issues or gaps that have not been answered by previous researchers. The review here will broadly follow the broad topics related to strategy management and innovation as outlined in Figure 1.1 leading to a special focus on the Balanced Scorecard and Design Thinking. A special section is devoted to discuss SME related issues related to these topics. This chapter ends with a specific discussion on the SME landscape in Malaysia. The Action Research methodology is discussed in Chapter Three.

2.1 Business Strategy Overview

Johansson and Woodilla (2009) presented an interesting review of business strategy in relation to innovation and DT. He showed that the foundation of business strategic management is frequently traced to (Barnard, 1938), (Chandler, 1962) and (Ansoff, 1965). Chandler (1962) was a business historian and worked with mixed empirical data and did a comparative analysis that identified patterns in the growth of diversified companies during the 1920s and 30s. Ansoff (1965) with a background in applied mathematics, created analytical tools to help companies develop their own strategic position.

Porter (1979, 1987, 1990, 1996, 2008) with his ‘five forces’ and ‘value chain’ analyses further developed Ansoff’s analytical approach within the managerial discourse and authored many books and articles over a twenty-year period, through which he became recognized as a leading authority on business strategy. His work prescribed the strategic management discourse as normative, static and a way for the chief executive to formulate a plan before being implemented by the organizational hierarchy. As the strategic planning school gained traction, many companies hired corporate planners who established formal long-range planning systems that functioned in a detailed and logical systematic process. Corporate leadership expected these processes to produce successful strategies. Porter (1987) pointed to organizational critics who suspected that in most cases, the output was merely thick planning books and 5-year financial projections increasingly viewed as irrelevant by top managers. For much of the 1980s, Porter (1979, 1987) through his work on

notably the 5-forces and value chain models influenced company strategists to focus on strategizing how to improve and secure competitive positions within their current markets. However, the issue of how to create whole new markets was seen to be the domain of the innovation literature, supported by concepts and tools that remained secondary to mainstream strategy (Leavy, 2010).

By the mid-1980s, those who criticized that the analytical planning processes were insufficient advocated a new approach (Mintzberg & Lampel, 1999). Mintzberg (1994) viewed that strategic thinking should rely more on creativity and intuition than it does on analysis. He identified shortfalls with strategic planning and provided a stark diagnosis: strategic planning is not strategic thinking. He claimed that strategic thinking is about synthesis that involves intuition and creativity. He viewed strategic planning as a separate process from strategic thinking, one that should provide data and act as a catalyst for true strategic thinking but certainly not provide the ‘one right answer.’

In the early 1990s, Hamel and Prahalad (1996) addressed the challenge of new market creation and introduced the concept of the ‘white space’ as in Figure 2.1. “When one conceives of a company as a portfolio of competencies, a whole new range of potential opportunities opens up. We use the term ‘white spaces’ to refer to opportunities that reside between or around existing product-based business definitions” (Hamel & Prahalad, 1996, p. 84). Coming from a resource-based economic perspective, their concept of core competencies as collective learning in the organization provided an impetus for working across organizational boundaries and creating alliances while focusing on internal development.

Other schools of strategy have emerged since then. Mintzberg, Lampel and Ahlstrand (2005) have categorized 10 distinct strategy formulation schools as summarized in Figure 2.2. While the authors acknowledged that some of the schools are really concepts rather than firm constructs, they showed how each school offers a different view to examine how organizations think about and create strategy.

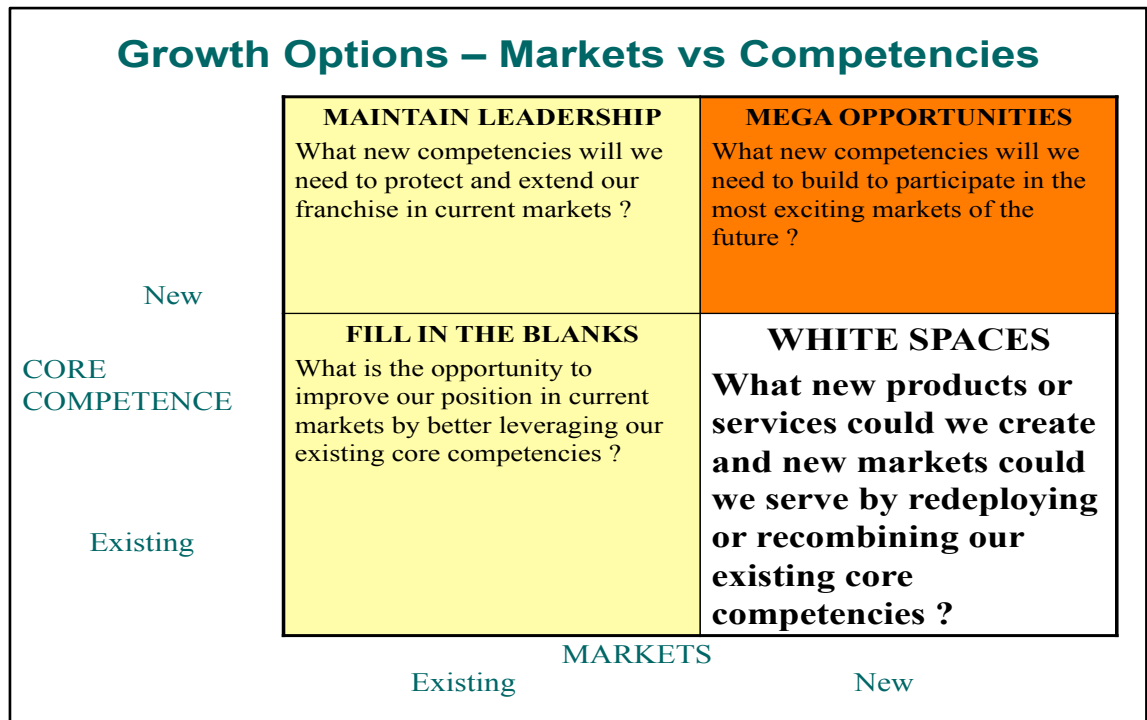


Figure 2.1
White Space Concept

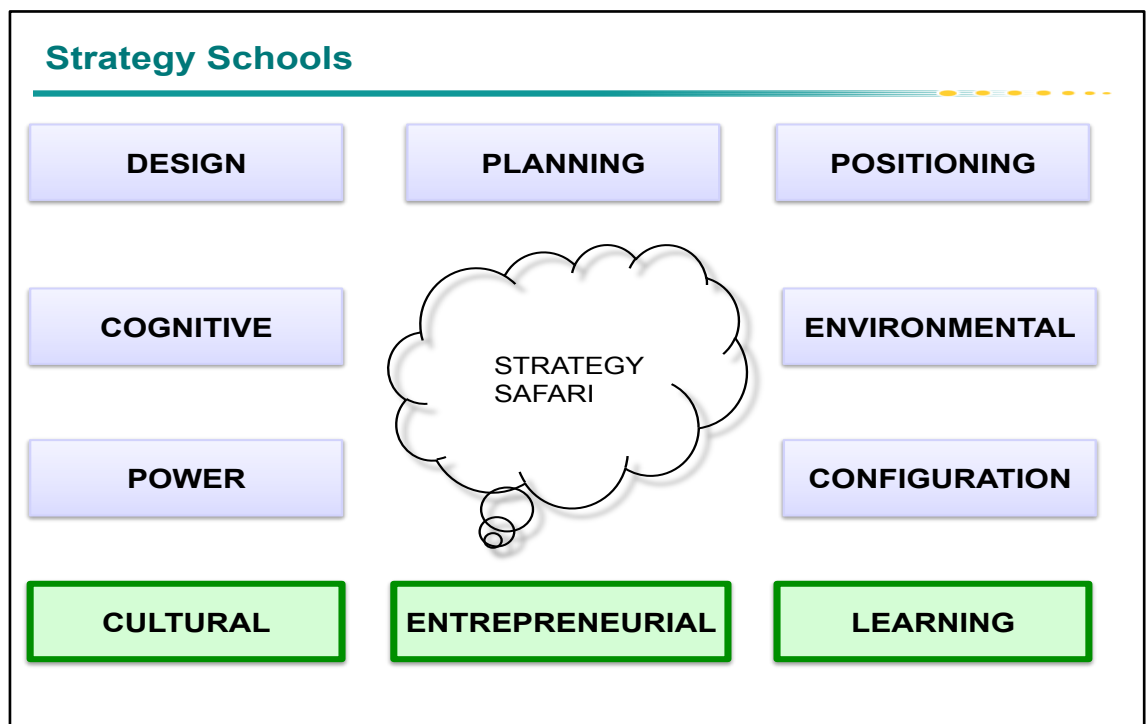


Figure 2.2
10 Strategy Schools

Leavy (2010) claimed that perhaps the most exciting development in the field of strategy since then has been the growing interest in the notion of ‘value innovation’ under various captive titles like ‘blue ocean strategy’ (Kim & Mauborgne, 2005),

‘customer experience co-creation’ (Ramaswamy & Gouillart, 2010) and ‘design-driven innovation’ (Verganti, 2009), all of which offering new opportunities for growth. Rather than competing within the existing industry or trying to steal customers from rivals in the ‘red ocean’, a company can create an uncontested market space that makes competition irrelevant; this is a ‘blue ocean’. The discourse is concerned with the strategic moves, as managerial actions and decisions, rather than naming competitors or rivals. A recent addition to this growing interest in value innovation is the role of design thinking in strategy management (Brown, 2009; Martin, 2010; Liedtka & Ogilvie, 2011)

Strategy obviously is a subject matter that has interested many academics and practitioners since the early formal works. The researcher does not intend to present a comprehensive and critical review on business strategy but to mention that there are many schools of thought, frameworks, techniques, rules and guiding principles related to strategy thinking, development and implementation. There are also many terminologies used that may not have a common meaning in the vast and rich literature related to strategy. Thus business strategy appears to be a diverse, dynamic and complex subject matter.

The richness and dynamism of strategy is due to its importance in business success. Almost every significant business or organizational success case is attributed to strategy and becomes a case study focus among strategy academics resulting in different views on the ‘lessons learned’ and ‘reasons why the company succeeded’. Nevertheless, strategy remains important for businesses. Strategy is considered the main driver of competitive advantage (Larsen *et al.*, 1998). Strategy is also considered as one of the most effective ways for companies, regardless of size or sector, to cope with the changes in the business environment (Hart & Banbury, 1994). Thus strategy can help both large and small firms to be more competitive.

Some research studies indicated that small companies using strategic planning performed better than those that did not (O'Regan & Ghobadian, 2004). Others found that small companies with strategic orientation were likely to have significant capability to grow, expand, innovate and introduce new products to the market place (Joyce *et al.*, 1996).

2.1.1 Working Definition of Strategy

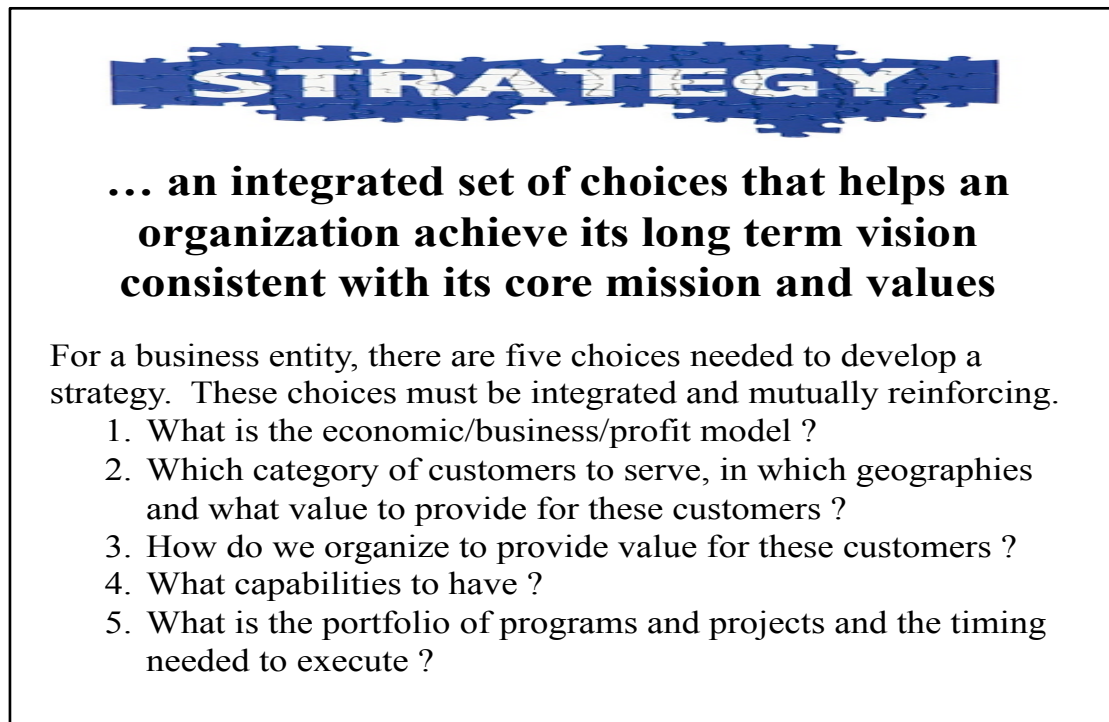


Figure 2.3

Researcher Summary of a Working Definition of Strategy

The first step in simplifying strategy is to define it. Here again there are many views and definitions (en.wikipedia.org/wiki/Strategy). The researcher summarizes the working definition in Figure 2.3. Clearly businesses need a strategy to improve their performance in the future since the results of the strategy implementation will only be seen in the longer term. That longer-term success must be described through a high-level vision. Collins and Porras (1994) studied companies that were built to last and concluded that these companies had an enduring core ideology as its foundation and a clear envisioned future that provides dynamism and relevance to the present and the future allowing the firms to re-invent, change and innovate. They described a good vision statement as; giving the organization a significant challenge, providing a focal point for effort, having a clear finish line or strategic destination, and engaging members of the organization

Kaplan and Norton (2008) preferred that the vision be quantified (Figure 2.4). Visions must clearly indicate the gap, preferably a quantifiable value gap, between what the firm is today and where it expects to be in say three years time. Strategy will be the integrated choices translated into programs and projects that the organization implements to close the value gap.

Perhaps the most significant responsibility of leaders within their organization is to set its direction; the core ideology in terms of values and purpose, and the envisioned future of the firm (Collins & Porras, 1994). Mintzberg, Lampel and Ahlstrand (2005) considered strategy formulation through a visionary process as the Entrepreneurial School of strategy.

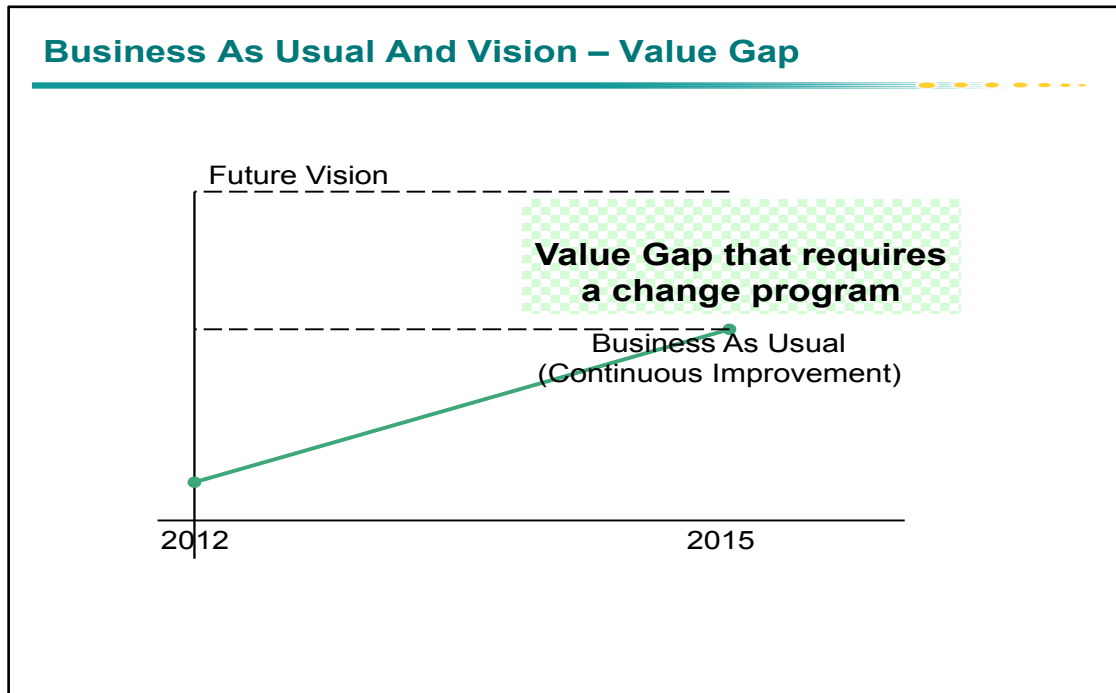


Figure 2.4.
Value Gap and Strategy

Once the future vision is determined, the firm must ask what additional new and perhaps different things the firm must do to achieve the vision. This integrated set of choices and actions are what constitute strategy. The firm will certainly not achieve its future vision without any change or intervention program. Normal business-as-usual activities may lead to nominal improvements in the business but will not lead it to its grander vision. This intervention change program is the starting point of a company's strategy, as depicted in Figure 2.4. For a business entity (Hambrick & Fredrickson, 2005) recommended five choices needed to develop a strategy. These choices must be integrated and mutually reinforcing.

- i. What is the economic model? A profit formula, which defines the way the company will capture value, based on the four variables most critical to profit generation – revenue model, cost structure, target unit margin and resource velocity (Collins 2001; Leavy, 2010; Slywotzky, Morrison & Andelman, 2002).

- ii. Which category of customers to serve, in which geographies and what value to provide for these customers? A strong Customer Value Proposition (CVP) describes how a company creates value for a chosen set of customers at a defined price (Treacy & Wiersema, 1997).
- iii. How do we organize to provide value for these customers?
- iv. What capabilities to have? The key resources and key processes by means of which value is delivered to the customer and the company (the CVP and the profit formula) in a repeatable and scalable fashion, providing the essence of a company's competitive advantage.
- v. What is the portfolio of programs and projects and the timing needed to execute? The strategic choices above must be translated into tangible and actionable projects that the company can implement to execute the strategy. These projects move the strategic choices from concepts and ideas into action.

The above offers a simple but practical and actionable definition of strategy. Many of the popular strategy formulation techniques and methods can easily be mapped to the components of the proposed strategy definition. The works by Collins and Porras (1994) and Collins (2001) on building great and lasting companies discuss the portion on strategy related to mission, values and vision. Zook and Allen (2001) and Slywotzky, Morrison and Andelman (2002) are examples related to the profit model. The popular work on 'Blue Ocean Strategy' (Kim & Mauborgne, 2005) and customer experience co-creation (Ramaswamy & Gouillart, 2010) mainly relates to the customer value proposition. Treacy and Wiersema (1997) wrote the classic thesis on the customer value proposition. The works on core competencies (Hamel & Prahalad, 1996) and design-driven innovation (Verganti, 2009) are examples of strategy techniques based on processes and capabilities. Positioning and niche based techniques like scenario planning (Ringland, 2006) and Porter's classic 5 forces and value chain models (Porter, 1987) can also be mapped to the component of strategy related to processes and capabilities.

The researcher views that the heart of strategy is in defining customer value propositions and developing sustainable capabilities to support the choices made to provide value to customers. This is particularly relevant for SMEs in developing and implementing strategies as the concepts involved are quite easy to understand. More

importantly, the implementation involves development of strategic capabilities that involve processes and human skills, the real sustainable strengths of most SMEs.

2.1.2 Customer Value Proposition

For businesses, customers are the real sources of revenue. Companies can hypothesize and develop different economic models and profit formulas but must realize these through customers. Customers in general are not concerned about a company's strategy but are mainly concerned about the value they can realize by patronizing the products and services provided by the company. Thus any company that cannot describe which customer segments it wants to serve and what value its products and services offer these targeted customer segments, can never differentiate itself as a business.

The essence of strategy is about choices and differentiation. Porter (1987) originally proposed what were called generic strategies with the original three choices of Cost Leadership, Differentiation and Focus. A fourth choice, System Lock-in, has been added recently (Kaplan & Norton, 2008). These generic choices of competitive advantage present different ways to think about how businesses compete within and across various industries. Treacy and Wiersema (1997) proposed the concept of the customer value proposition (CVP) which really lies at the heart of strategy.

The CVP is about having clear and concise factual statements of tangible results about a company's products and services that uniquely meet the needs of targeted market segments (geographies, product segments) and customer segments (age groups, race). Different value propositions will attract and retain different target markets and customers. Treacy and Wiersema (1997) identified three customer-focused value propositions; Operational Excellence, Product Leadership and Customer Intimacy. The central idea is to excel at one dimension of value while maintaining threshold standards on others. Some examples are given in Figure 2.5.

<p>Different strategies require different value propositions that will attract and retain target customers.</p> <ul style="list-style-type: none"> ▪ 3 customer-focused strategies. ▪ Central idea is to excel at one dimension of value while maintaining threshold standards on others 		
<p>Operational Excellence</p> <p><i>"Operationally excellent companies deliver a combination of quality, price and ease of purchase that no one else can match"</i></p> <p>Tesco Toyota McDonalds AirAsia</p> <p>Best Total Cost</p>	<p>Product Leadership</p> <p><i>"Product leadership companies push its products into the realm of the unknown, the untried, or the highly desirable"</i></p> <p>Sony BMW, Porsche Harvard University Intel, Apple</p> <p>Best Product</p>	<p>Customer Intimacy</p> <p><i>"A Customer Intimate company builds bonds with customers: it knows the people it sells to and the products and services they need"</i></p> <p>Home Depot IBM Bentley Airborne Express</p> <p>Best Total Solution</p>

Figure 2.5
Three Customer Value Propositions

Putting It All Together		
PORTER'S GENERIC STRATEGY	CUSTOMER VALUE PROPOSITION	STRATEGY DEVELOPMENT TECHNIQUES
Cost Leadership	Operational Excellence	TQM Lean Manufacturing Six Sigma Business Process Re-engineering
Differentiation	Product Leadership	Design Driven Innovation Profit From the Core Core Competencies
	Customer Intimacy	Blue Ocean Experience Co-Creation
System Lock-In	Product/Technology Leadership	Economic barriers to exit Switching costs Unique geographical locations
<p>Strategy development techniques should relate to the intended generic strategy and customer value proposition. Some popular techniques are mapped accordingly. There are many more techniques.</p>		

Figure 2.6
Generic Strategies, CVP and Strategy Techniques (Palladium, 2010)

The core of strategy is about prioritizing choices and value propositions. Figure 2.6 puts this concept together and also maps selected strategy development techniques with the CVPs. Lock-in strategies that are not based on unique geographical locations (like Niagara Falls or the holy cities of Mecca and Medina) or abundance of particular natural resources are really about superior technology

platforms that dominate the market and set the standards. Microsoft Windows set the standard for the personal computer operating system. Intel set the standard for microprocessors in personal computers. Google is the emerging standard for search engines. Apple iOS, Google Android and Microsoft Mobile Windows are now fighting to set the standard for mobile computing operating systems and creating large economies around their platforms. Thus System Lock-in is really about product and technology leadership.

Figure 2.6 also emphasizes that strategy is not about adopting one of the strategy formulation techniques. These techniques detail out the specialized procedures and methods to formulate a specific CVP. Many of these techniques are detailed, elaborate and rather complex. They also require significant effort and time to implement. The CVP is the real starting point of strategy and the various strategy formulation techniques can be applied, if needed, based upon the intended value propositions. The researcher would like to emphasize the ‘if needed’ qualification. Strategy can be simplified to its bare essence; knowing which customers to serve and being clear about how the firm’s products and services offer value to these customers. The specific techniques are rather periphery to this core simple choice.

This critique conclusion that strategy can and should be simple is also supported by (Eisenhardt & Sull, 2001). This is also of particular relevance to SMEs that have to strategize and differentiate to remain competitive and have a chance to grow. It is a starting point for the relevant need to develop simpler approaches to strategy.

The CVP together with the profit model can be simplified to mean the ‘what’ of strategy. The final three components of the proposed working definition of strategy address the ‘how’ of strategy. They define the key resources and key processes through which value is delivered to the targeted customers in a repeatable, sustainable and scalable fashion, providing the essence of a company’s competitive advantage. The strategic choices above must be translated into tangible and actionable projects that the company can implement to execute the strategy. These projects move the strategic choices from concepts and ideas into action.

2.1.3 Resource Based View of Strategy (RBV)

Defining the key resources and processes as part of strategy can be related to the resource based view of strategy (RBV). RBV is about the management of core

competencies, those skills and learning capabilities that give a workforce its ability to sustain an organization's competitive advantage (Prahalad & Hamel, 1990; Teece *et al.*, 1997). Kerr, Way and Thacker (2005) presented quite a comprehensive review of RBV. RBV has focused on the creation of unique stocks of resources in companies since its inception (Barney, 1991; Penrose, 1959; Wernerfelt, 1984). The unique stocks of resources are built up over time and explain the diversity of companies (Barney, 1991), provide protection from imitators and ultimately result in better performance (Peteraf, 1993).

O'Regan and Ghobadian (2004) mentioned that recent studies based on RBV validate that competitive advantage arises from organizational capabilities (Barney, 1991; Peteraf, 1993; Teece *et al.*, 1997). This view suggests that competitive advantage and performance results are a consequence of firm-specific resources and capabilities (Barney, 1986; Wernerfelt, 1984). The core of RBV is that firms differ in fundamental ways as each has its own 'bundle' of resources (Grant, 2002, p. 139). The literature suggests that one of the most effective means of achieving competitive advantage is by using the firm's 'competencies' or 'capabilities' (Barney, 1986; Peteraf, 1993; Wernerfelt, 1984).

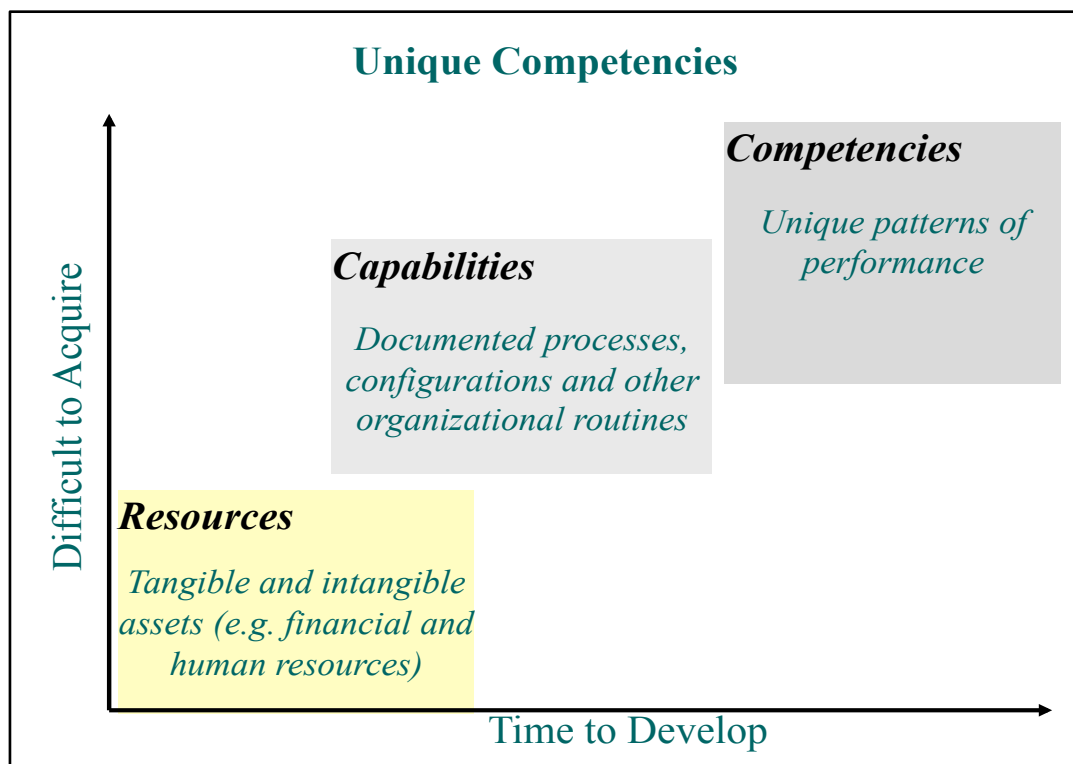


Figure 2.7
Hierarchy of Resources, Capabilities and Competencies

The literature uses the terms resources, capabilities and competencies interchangeably and with different meanings. Marcus (2005) differentiated the terms as shown in Figure 2.7. Resources are tangible assets like cash, plant and inventory, which are captured in the firm's balance sheet. It also includes intangible assets like brand name, skills and patents. Capabilities refer to the things that the firm does well like the ability to commission projects within budget, develop products and retain customers. Competencies are the routines, patterns of action or capabilities that must add value, be difficult to replace by substitute processes, be difficult for competitors to imitate, and be immobile across firm boundaries (Barney, 1991; Grant, 1996). In addition, to qualify as a core competence, it must be a close integration of skills or technologies, be competitively unique, and must contribute to customer perceived value and provide an entry into new markets (Hamel & Heene, 1994; Prahalad & Hamel, 1990; Wang & Lo, 2003). Core competencies as defined above certainly provide a major competitive advantage to the company. For a competency to be valuable, it must provide tangible and direct benefits to customers, i.e., relate to the company's CVP.

Wang and Lo (2003) summarized many different ways to view core competences with different emphasis trends. They have been referred to in the contexts of functional areas, capabilities, competencies and technologies (Prahalad & Hamel, 1990), skills and resources or a complex knowledge system that includes employee skills and learning, and the technological, managerial and value systems of the firm. Core competencies also include the special role of technology, R&D competence, production and manufacturing competence, and marketing competence. Core competence includes shared value systems, recipes and routines as fundamental components. Hamel and Heene (1994) distinguished market-access competences, integrity-related competences and functionality-related competences. It is important for the firm to focus more attention on strategic resources and the resources considered as core competence should be scarce, unique, specific, intangible, immobile and difficult to substitute and imitate (Wang & Lo, 2003).

Although most writers tend to focus on technological competences as the basis for core competences, other knowledge-based or experiential assets may underlie core competences (Wang & Lo, 2003). For example, organizational culture could also be a fundamental source of core competences and sustained competitive advantages (Barney, 1986).

Although most of the current core competences of a company are mainly developed from of past activities, what matters is the range of future activities that they make possible and the fact that they constitute the fundamental sources of sustainable competitive advantages (Prahalad & Hamel, 1990). At the same time, core competences represent both the underlying knowledge base and the set of skills required to compete successfully. What is more, a company's current core competences serve as platforms for ongoing development and application of those new competences needed to sustain competitive advantages in the future, which evolve through an iteration of repeated doing and learning, with each sequence of iteration expanding knowledge and enriching the core competences. This may explain why companies are being increasingly seen as portfolios of core competences, which encourages a deliberate and proactive approach toward the development of competence, sees competence as being applied across multiple businesses, and views competition as being over the acquisition and development of competences (Wang & Lo, 2003).

Prahalad and Hamel (1990) and also Hamel and Heene (1994) pointed out that core competencies must contribute to customer perceived value and provide an entry into new markets. This relationship is central in the proposed working definition of strategy (Section 2.1.1). The firm iteratively identifies what value they provide targeted customers and what competencies they need to develop and continue improving to deliver the prescribed value. Likewise they can evaluate their existing competencies and ask how they can leverage these competencies to further grow their business as summarized in Figure 2.8 (Hamel & Prahalad, 1996).

Wang and Lo (2003) further elaborated on this link between customer-focused performance and competence building and leveraging. They provided recent theoretical developments and empirical evidence showing that companies with superior competences are better generators of information about customer wants and needs and are also better at developing and marketing goods or services to meet these wants and needs by well coordinated activities. Superior competences also give companies the capability to generate and act on knowledge about competitor moves, actions and reactions, which help them to develop the basis for competitive advantages (Woodruff, 1997). With the existing core competences as the leverage, organizational learning in the resource market (from component suppliers, human capital, investors and debtors) and in the product market (from dealers, customers,

competitors and partners) will help companies find profitable opportunities to build new competences, enhance and further leverage existing ones, reorient strategic positioning and adapt effectively.

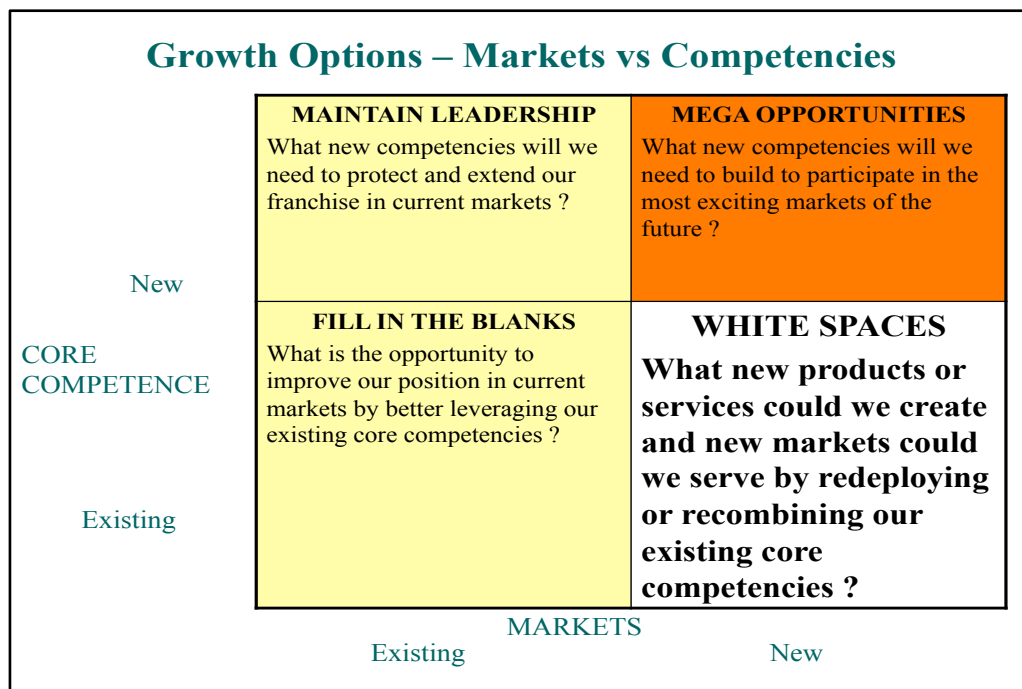


Figure 2.8
Mapping Competencies With Markets

Wang and Lo (2003) classified competences into three broad types and provided detailed referenced explanations for each: technological competences, marketing competences and integrative competences. Each of these makes a different contribution to the core competences of a firm in terms of value. It is interesting to note their view that technological competences contribute the lowest to core competences in customer-oriented environments, compared with the other two competences.

Market competences are defined as the processes designed to apply the collective knowledge, skills and resources of the company to create value in its products and services so as to meet the competitive demands of customers. They are based on a profound understanding of the current and future needs of customers, their preferences, and knowledge of the competition. So there are two important elements of market competences in nature: customer knowledge and access and knowledge of the competition. Marketing competences contribute more than technological competences to core competences in customer-oriented environments (Wang & Lo, 2003).

Even though unique marketing competences and technological competences are strategically important, not all companies in possession of them achieve above industry average performance (Teece, 1986; Teece *et al.*, 1997). In practice, to compete successfully companies need one more important competence: **integrative competence**. Integrative competences enable firms to combine the wide-ranging capabilities, information, experiences and knowledge necessary to develop products or services for the targeted markets (Grant, 1996). Integrative competences also enable firms to generate new applications of existing knowledge and guide the problem-solving strategies that shape the development of new competence (Wang & Lo, 2003). Integrative competences have at least four abilities (Wang & Lo, 2003):

- i. to integrate different technological specialties;
- ii. to combine different functional specialties;
- iii. to exploit synergies across business units or divisions; and
- iv. to integrate the whole dynamic competence building and leveraging process.

Integrative competences contribute the most to core competences in customer-oriented environments (Wang & Lo, 2003). Regardless of the category of competences they belong to, core competences must add value, must be difficult to replace by substitute processes, be difficult for competitors to imitate and should be immobile across company boundaries so that the company can sustain those advantages, (Barney, 1991; Grant, 1996).

In reviewing the literature on RBV and core competencies, there exists a distinction between generic (like marketing, project management and order processing) and specific competencies (like software programming in Java) and their different roles in enhancing the firm's competitiveness. O'Regan and Ghobadian (2004) presented findings based on data collected from 194 manufacturing SMEs. The analysis confirmed that generic organizational capabilities have a positive impact on strategy deployment and on the achievement of overall performance. A further analysis comparing the emphasis on generic capabilities by both high and low performing firms found that high-performing firms emphasized capabilities to a far greater extent than low-performing firms. **This implies that generic capabilities can be one of the main drivers of performance for SMEs.** This is of related importance to this research since it studies the contribution and impact of design

thinking in an SME. Design thinking can be both a generic and specific competency. This will be discussed later in this review.

Another distinction relates to static and dynamic competencies. Kerr, Way and Thacker (2005) mentioned recent work on RBV that addresses dynamic capabilities. These are mechanisms by which firms "integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece, Pisano & Shuen, 1997, p. 516). Eisenhardt and Martin (2000) extended the concept of dynamic capabilities to include moderately changing business environments by involving the concept of routines (Nelson & Winter, 1982). Whether in fast or moderately changing environments, dynamic capabilities are repositories of organizational learning, functioning as tools "through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness" (Zollo & Winter, 2002, p. 340). Capabilities must evolve over time to suit the business focus of the organizations. Thus the RBV has two distinct viewpoints (Azadegan, Bush & Dooley, 2008; Schulze, 1994): the steady-state perspective (Barney, 1991, 2001; Wernerfelt, 1984) and the dynamic capabilities perspective (Eisenhardt & Martin, 2000; Teece *et al.*, 1997). The focus of the steady state perspective is on a company's ability to gain and sustain competitive advantage. The dynamic capabilities perspective considers RBV as a changing and evolving paradigm, subject to development and enhancements (Colbert, 2004).

Azadegan, Bush and Dooley (2008) addressed the concept of dynamic capabilities linked to creativity related to product design, providing a more practical difference between the static and dynamic views of competencies. The study is also focused on the aspect of creativity and design, which is closely related to this research's topic on DT. Companies can enhance their creativity either through hiring or through internal development of their employees. Depending on the static or dynamic nature of creativity, hiring or development may be more appropriate. If creativity is static, companies are better off focusing attention on recruiting whereas if creativity is dynamic, then training becomes more important.

So, what type of resource is design creativity? The steady-state perspective viewed that design creativity provides a competitive advantage because it is valued, rare, inimitable and non-substitutable. Design clearly fits much of the requirements to be a resource (Borja de Mozota & Kim, 2009). Firstly, design is **valuable** to companies because it results in innovations, which in turn provide competitive

advantages to companies (Azadegan & Dooley, 2007; Ravasi & Lojcono, 2004; Scanlon, 2007; Verganti, 2009). Secondly, individual differences in creativity are 'huge' (Simonton, 1999; p. 309). With over 50 per cent of all creative ideas generated by the top 10 per cent of the productivity distribution (Simonton, 1984), design creativity is quite **rare**. Thirdly, design creativity is **difficult to imitate**. By definition, the duplication of a design renders it as an imitation and copied creations are labelled as replicas (Azadegan, Bush & Dooley, 2008). Fourthly, since design creativity resides with individuals (Davis, 1989), as long as creative designers stay with a company, their capabilities also stay, making their design creativity sustainable. This is the perspective provided by the static view.

Gaining sustainable competitive advantage from design creativity requires companies to capture and maintain it by hiring and retaining creative individuals. Acquiring creative talent has become a relatively easy task for many companies. Similarly, acquiring material for and conducting training seminars is a common company practice. Yet some companies remain more creative than others. The dynamic perspective explains the difference in creativity between companies by focusing on the integration of resources rather than the resources themselves (Palie *et al.*, 2007). This perspective highlights the differences in levels of creativity and types of training and development, and considers how varying combinations among them can lead to better results. The underlying assumption of dynamic capability is that creativity in general, and design creativity in particular, can be manipulated and improved (Azadegan, Bush & Dooley, 2008).

The dynamic capabilities perspective views that if design creativity is a dynamic resource then it should be enhanced through integration with training and learning. The static view suggests that firms need to acquire creative design personnel externally, while the dynamic view suggests that they can be developed internally.

2.1.4 Competencies and SME Strategy Development

Section 2.1.3 mentioned that using the company's competencies or capabilities is one of the most effective means of achieving competitive advantage. The importance of the CVP was highlighted in Section 2.1.2. Successfully integrating these competencies to deliver the CVP is the essence in determining a company's strategy.

The rather detailed presentation on core competencies may indicate that the concept is complex, terminology-heavy and restrictive especially in meeting the rigorous requirements of what makes up a core competency. But competencies are the real strengths that SMEs possess mainly through the skills, knowledge, experiences and vision of the founders and top management. These competencies they possess are what they can train and develop among the other staff. So even if these competencies are not rare, inimitable and non-substitutable, they must at least meet the one remaining requirement for a core competency, they must contribute to customer perceived value and provide an entry into new markets (Hamel & Heene, 1994; Prahalad & Hamel, 1990; Wang & Lo, 2003). For a competency to be valuable, it must provide tangible and direct benefits to customers, i.e., relate to the firm's CVP.

Kerr, Way and Thacker (2005) showed that the resources for maintaining organizational competitiveness are most often related to human capital (HC) in the form of technological or other forms of know-how (Teece, 1980; Teece, 1982), innovative expertise or process-oriented abilities in the form of routines (Nelson & Winter, 1982) and knowledge integration (Grant, 1996). This finding is an important factor in this research. HC is the real capital that all SMEs have in common and the know-how is usually held by the owners and senior managers of SMEs. This know-how can be made an organizational strength by the owners and managers transferring the know-how to the other workers using known HC development approaches like training and coaching. These are all within the control of the SME owners.

Kerr, Way and Thacker (2005) also mentioned that SMEs are extremely sensitive to the presence, skills and activities of managers (Wyer & Mason, 1998) and their high-knowledge workers (de Kok & Uhlaner, 2001). Thus SMEs should develop a unique set of capabilities in order to be differentiated from competitors and to support stronger relationships with customers. The unique nature of the knowledge and skill sets of owners and top managers makes them a likely source of organizational differentiation. This makes developing core competencies and capabilities as the key strategy development approach for SMEs. Developing capabilities and competencies is about the only sustainable strategy development approach for SMEs. Strategy for SMEs then is simply about integrating choices with regards the CVP and the related capabilities and competencies.

Compared to large organizations, SMEs face similar concerns in dealing with core competencies and capabilities. However, these concerns are met in a much more concentrated environment due to the smaller size and flatter organizational structures and draw generally from a smaller pool of competencies. Moreover, the same point applies to the management and professional talent in the typical SME, with the degree and depth of specialization usually being far more limited.

The foundation of organizational competitiveness has shifted from physical and tangible resources to knowledge (Wong & Aspinwall, 2005). SMEs can improve their responsiveness by developing capabilities in external knowledge acquisition (Liao *et al.*, 2003). Oyeyinka and Lai (2006) asserted that learning by doing is the most effective method to acquire knowledge. This claim has important parallels with some DT practices like prototyping as presented in Section 2.3.8. Innovation, knowledge accumulation and the development of internal technical capabilities help SMEs in achieving better competitive position in international and national markets (Vargas & Rangel, 2007). Creating sustainable innovation requires ongoing effort, commitment and understanding beyond that of continuous improvement (Humphreys *et al.*, 2005). Effective innovation must involve all areas of an SME with the potential to affect every function and process (McAdam, 2000b). SMEs could achieve greater innovation and productivity by adequately capturing, storing, sharing and disseminating knowledge (Nunes *et al.*, 2006). SMEs do create knowledge but are poor at knowledge retention (Levy *et al.*, 2003). Management and retention of employees' knowledge and skills is essential for innovative products and processes,.

2.1.5 SME and Strategy Management

SMEs are considered the engine of economic growth in most countries. They create and provide job opportunities, act as supplier of goods and services to larger companies and also the government. SMEs are defined by a number of factors and criteria, such as location, size, age, structure, organization, number of employees, sales volume, worth of assets, ownership through innovation and technology (Rahman, 2001).

SMEs face numerous challenges related to conformance to quality, product features or attributes, competitive price and performance (Corbett & Campbell-Hunt, 2002). The capacity to maintain reliable and continuously improving business and

processes to meet the above challenges appears to be a key condition for ensuring its competitiveness in the long run (Lagace & Bourgault, 2003).

Other major challenges for SMEs include; keeping up with technology (Kleindl, 2000), human capital development (Hudson *et al.*, 2001), new product development (Sonia & Francisca, 2005), and managing its supply chain through partnerships with customers, suppliers, distributors, competitors, and other organizations such as consulting firms and research centers (Soh & Roberts, 2005; Bennett & O’Kane, 2006).

All of these challenges are actually differentiating factors of competitiveness covered in the business strategy literature. It is difficult for any firm, especially the SME, to address all these challenges at the same time. Choices have to be made as to which of the challenges provide the greatest impact to the SME’s particular business. Strategy is about making these choices in an integrated manner as explained in Figure 2.3. Thus to compete SMEs need to develop and implement a strategy.

However, Vos (2005) and French (2009c) have observed that managers of SMEs have poor skills in reflecting upon their companies strategically. SMEs often are oriented towards serving local niches or developing relatively narrow specializations (Urbonavicius, 2005) and are more focused on the operational issues (French, 2009c). They may have constraints due to limited resources, lack of technical expertise, limited innovation, knowledge loss due mainly to staff turnover, etc. The flat structure of SMEs can often limit employees from realizing their short and mid-term career goals, explaining why SMEs may find it difficult to employ high-caliber staff and even harder to retain them (Ghobadian & Galleary, 1996).

Singh, Garg and Deshmukh (2008) noted that some major constraints on SMEs in meeting the challenges of competitiveness are:

- i. Inadequate technologies as well as other resources (Gunasekaran *et al.*, 2001; Hashim & Wafa, 2002).
- ii. High cost of product development projects (Chorda *et al.*, 2002).
- iii. Lack of effective selling techniques and market research (Hashim & Wafa, 2002).
- iv. Unable to meet the demand for multiple technological competencies (Muscatello *et al.*, 2003; Narula, 2004).

- v. Information gap between marketing and production functions as well as lack of funds for implementing expensive business productivity software such as ERP systems (Xiong *et al.*, 2006).

Nevertheless, SMEs that link operations to their business strategies perform better than the competition. As mentioned in an earlier part of this section, SMEs should focus on developing their existing competencies but relate it to how they can deliver value to their customers. Corbett and Campbell-Hunt (2002) proposed that SMEs should focus their energy and resources on innovative products and its related niches. O'Regan *et al.* (2006a, 2006b) observed that high-growth firms place a greater emphasis on external drivers such as strategic direction, their operating environment and the use of e-commerce compared with firms having static or declining growth. Singh *et al.* (2006) concluded that SMEs should be flexible in developing their strategies. Chou and Hsu (2005) have suggested that by developing industry portals, SMEs can be more flexible and agile, despite their lack of resources.

Singh, Garg and Deshmukh (2008) reviewed about 134 research papers and specifically concluded that for SMEs to be more competitive they need to develop and implement strategy successfully. This review identified the following gaps:

- i. There has been lack of empirical research on strategy development by SMEs for competitiveness. Even in developed countries, most of the studies related to competitiveness have been devoted to large-scale enterprises (LSEs). These studies have also not tried to compare SMEs with LSEs as well as different industry sectors in terms of operation management issues. Most of the researchers have not tried to analyse the difficulties and constraints of SMEs under the new globalized and liberalized economy.
- ii. SMEs have not given due attention for developing their effective strategies in the past. The reviewed literature reveals that most of the strategies have been formulated for short-term goals as most of them are localized in their function.
- iii. On the export front, SMEs are facing many constraints due to their limited resources and lack of innovation in capability development.
- iv. SMEs are also not following any comprehensive framework for developing their strategies and quantifying their competitiveness.

Kerr, Way and Thacker (2005) commented that small firms with active strategic planning and communication are expected to out-perform those without, with many of the formal techniques associated with the process, being key concerns. Other issues compound the complexity of strategy management in SMEs. For example, SMEs are typically subjected to external pressures from both suppliers and their large customers that sometimes deny the opportunity for the strategy formulation and formal planning techniques that are routinely undertaken in large organizations. Resources, both financial and managerial, are often simply limited in the SME.

Due to both their resource demands and their perceived rigidity, coming out with a broad set of formal planning documents is not expected to be positively associated with organizational performance in SMEs (McCartan-Quinn & Carson, 2003). The crucial need to adapt and meet external demands lessens the need to state a small company's plans in minute detail at any single point in time. However, statements of purpose or vision, sufficiently adapted for the use of small companies, have been connected to success (Stonehouse & Pemberton, 2002). Stated formally in relation to the proposed definition of strategy in Section 2.1.1, **a written mission, values and vision statement is positively associated with organizational performance of SMEs**. This finding further validates the proposed working definition of strategy that incorporates the important statements of purpose and vision.

Strategy is expected to guide the successful SME, with informality as a distinctive characteristic, in contrast to the large organization (Kerr, Way & Thacker, 2005). Only general guiding instruments, like mission statements, and operational documents like short-term, written project plans should therefore offer SME managers more traction in dealing with their strategy implementation. The expression of strategy is more likely to be a function of top leadership, organizational culture and direct, informal communication (Gibb, 2000; Miller & Toulouse, 1986).

O'Regan *et al.* (2005) have observed that the success of small firms is generally attributed to the managerial skills, training and education, and the personal background of the SME's leader(s). The drive to invest in new improvement programs is influenced mainly by senior management, regardless of firm size (Kaplan & Norton, 2000; Schroder & Sohal, 1999). Leadership plays a significant role in framing organization strategy (Kaplan & Norton, 2000), benchmarking of performance (Deros *et al.*, 2006) and in shaping the quality focus of companies (Sila & Ebrahimpour, 2005).

Apart from leadership commitment, culture and cultural fit are more important in SMEs than other organizations because an SME is likely to be entirely enveloped in a culture, rather than large organizations, where several cultures may be present (Singh, Garg & Deshmukh, 2008). It is easier to attain cultural change in SMEs than in larger organizations. However, it is probably more difficult for SMEs management to recognize the need for change (Ghobadian & Galleary, 1996). McAdam and McClelland (2002) have observed a strong correlation between the culture of continuous improvement and innovation in SMEs. The quality culture becomes a key enabler in the development of a more innovative practice. The flat structure of SMEs and fewer departmental interfaces normally result in a more flexible work environment that again helps to promote innovation.

Taticchi, Tonelli and Cagnazzo (2010) did a comprehensive literature review covering 6,618 papers in the field of performance measurement and management for SMEs and large companies to propose a research agenda for the future. Although the field of study is indirectly related to strategy management it does confirm that many management frameworks are designed for large companies and do not address the particular constraints and needs of SMEs like lack of resources and the need to be dynamic and agile. Figure 2.9 shows that specific management frameworks for SMEs are lacking and thus become open areas for research.

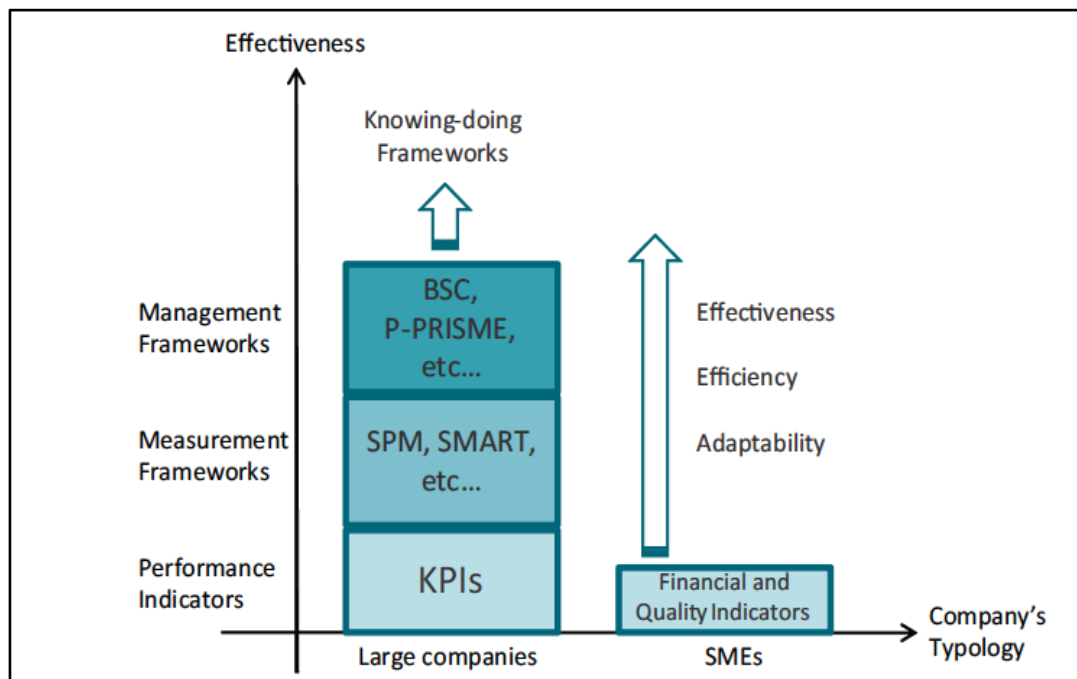


Figure 2.9

Gap in SME Frameworks (Taticchi, Tonelli & Cagnazzo, 2010)

2.1.6 Strategy Management Must Be Simple for SMEs

The review in Section 2.1.5 proves that strategy is important for SMEs but the methods to develop and implement strategies must consider the limitations that SMEs face. The wholesale adoption of many valid strategy methodologies designed for LSEs will probably not work for SMEs. The researcher's experience in strategy consulting (Appendix A.2.1) indicated that strategy development and implementation following the many different documented approaches and methodologies mentioned in strategy books and academic papers are time-consuming, resource sapping, costly and restrictive. But the most negative drawback is that these methods do not lead to simple and quick implementations. This last factor is particularly significant in the fast-paced networked economy today.

This view is supported by Eisenhardt and Sull (2001) who argued that when the business landscape was simple, companies could afford to have complex strategies. But now that business is so complex, companies need to simplify. This confirms that the search for simpler, less costly and more action-oriented strategy management approaches is of interest to not only businesses and strategy practitioners, but also academics. Eisenhardt and Sull (2001) proposed that strategy be based on a unique set of strategically significant processes and the handful of simple rules that guide them. Similar approaches like the hedgehog concepts are found in the work by Collins (2001). Collins (2011) recently advocated a similar SMaC (specific, methodical and consistent) concept. These approaches advocate companies to focus on selected processes and build core competencies to excel in the execution of current businesses while positioning them to capture unanticipated and fleeting opportunities that are becoming the norm in the current fast-paced networked economy. The processes might include product innovation, partnering, spinout creation, or new-market entry. Eisenhardt and Sull (2001) maintained that their proposed 'strategy as simple rules' is closer to the way entrepreneurs and underdogs seize opportunities in the here and now with a handful of rules and a few key processes.

Thus for strategy management to be of practical value to SMEs, the development and implementation methodology must, among other factors; be simpler to understand, takes a shorter time to develop and document, requires less

resources, requires less new and different skill sets, and most importantly, leads to faster action.

The predominant expression of strategy for SMEs is through activity rather than conception (Kerr, Way & Thacker, 2005). Thus many of the existing popular strategy development concepts may not be useful to the SMEs due to its resource demands and also the time taken before the strategy can be acted upon in terms of activities. With this observation, the final component of the proposed definition of strategy (Section 2.1.1) is purposely put into place to ensure that the ideas and choices related to strategy get translated into tangible projects.

From this overview of strategy and the final part relating strategy management and SMEs, the researcher highlights some important elements in developing a strategy framework for SMEs.

- i. Simplicity
- ii. Consideration of the resource constraints in time, people and skills
- iii. Costs cheap to implement, no consultants
- iv. Consideration of the leadership role in deciding the mission, values and vision
- v. Leverage on competencies for greater value
- vi. Timely and actionable to take advantage of identified opportunities
- vii. Build innovation in the process of developing strategy and its content
- viii. Informality in documentation, follow-up mechanisms and reviews

This research plans to address some of the gaps discussed in Section 2.1.5 and summarized above by proposing a simple but comprehensive framework for SMEs to develop and quickly implement their strategies. This framework also overcomes the many shortcomings in existing strategy development methods for use by SMEs. This framework will be developed and documented through a few AR cycles involving a singular case company, The Firm. The case study will also incorporate two elements in their strategy that is of importance to SMEs in general and Malaysian SMEs in particular. The first relates to developing an innovation capability based on design thinking practices (Brown, 2009; Martin, 2009; Liedtka & Ogilvie, 2011) as part of the strategic change agenda of the case company. The second element is increasing the export component of the company by tapping into the growing global mobile commerce.

2.2 Balanced Scorecard

The Balanced Scorecard (BSC) (Kaplan & Norton, 1992, 1993, 1996, 2000, 2004, 2008) and the works on how to build great and lasting companies (Collins & Porras, 1994; Collins, 2001) actually started the researcher's works related to strategy management since the mid-1990s.

The main research question addressed in this thesis is to propose a simpler framework for strategy management to address some of the mentioned issues related to strategy for SMEs. The ideas, concepts and practices related to the BSC and the researcher's broad practical experiences teaching, consulting and implementing the BSC together significantly influence the development of the proposed framework. Thus a critical discussion on the BSC is very appropriate in this literature review.

The Harvard Business Review has identified the BSC as one of the most influential management ideas in the past 75 years (Hbr.org, 2012). Thus the BSC is currently attracting a great deal of interest among both strategy practitioners and academics alike. Rigby and Bilodeau (2011) reported on a global survey of the use of 25 management tools and showed that the BSC is ranked overall as sixth out of the ten most used management tools. It is also used across various countries and across companies of various sizes. This shows that since its introduction in the academic literature (Kaplan & Norton, 1992) and then as a popular management book (Kaplan & Norton, 1996), the BSC remains a popular and relevant management concept and tool. This also validates that academic and practical knowledge contribution to the subject matter related to BSC is of current interest.

2.2.1 Summary on the Evolution of BSC

The original papers that presented the research work that outlined the BSC (Kaplan & Norton, 1992 and 1993) clearly show the central role of measures in the BSC. It was first proposed as a much improved and more effective organizational performance measurement system (PMS) as shown in Figure 2.10. Although the BSC concepts are now being presented as part of a broader strategy execution framework (Kaplan & Norton, 2008), measures still form a central emphasis in the current discussion by the authors on the subject matter related to the BSC when they promoted the importance of linking business analytics and operational scorecards to the BSC (Kaplan & Norton, 2010). In the concluding part of this review, the

researcher critically examines the problem of measures in the broader context of strategy management, particularly in the context of SMEs, and argues for the feasibility of doing away with measures. Figure 2.11 summarizes the original purpose and definition of the BSC (Kaplan & Norton, 1996).

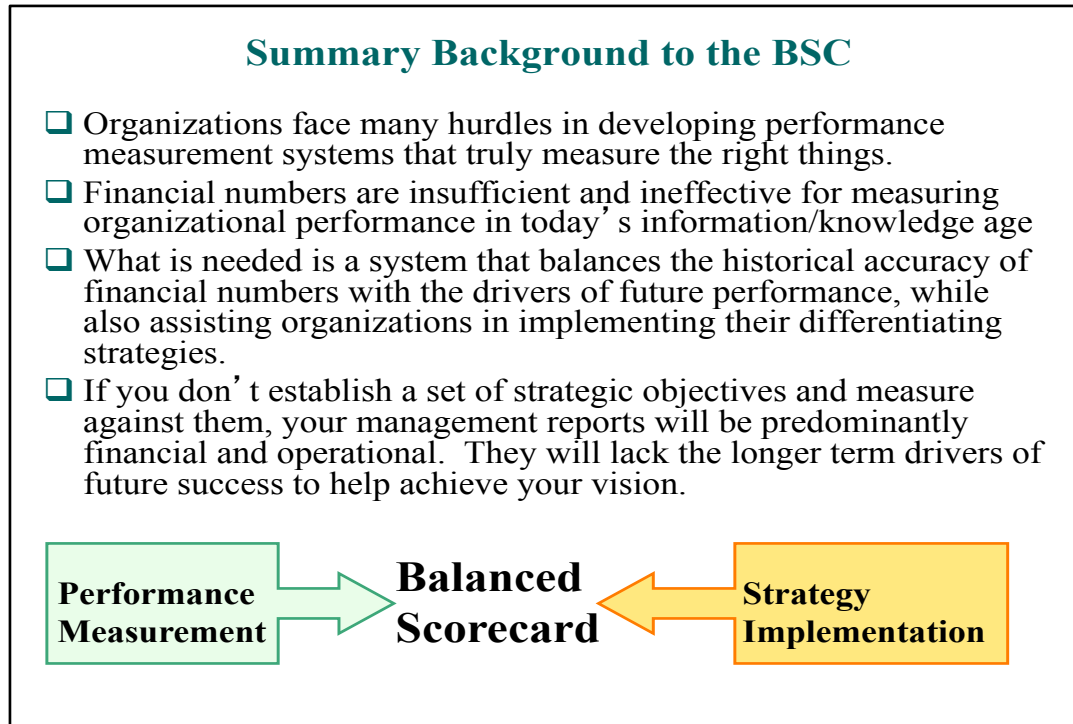


Figure 2.10

BSC From Performance Measurement to Strategy Implementation

The BSC concept has evolved starting from the first journal paper (Kaplan & Norton, 1992) and the first book (Kaplan & Norton, 1996) that proposed a multi measurement performance system. It has now expanded into a full-fledged strategy execution management system linking strategy to operations (Kaplan & Norton, 2008). Along the journey the BSC creators also tried to introduce new bodies of knowledge related to creating a strategy focused organization (SFO) (Kaplan & Norton, 2000) and the office of strategy management (Kaplan & Norton, 2005). The continual growth of related ideas, concepts and the many journal and seminar papers and books by other researchers, academicians and practitioners have removed any doubts that the BSC could be another management fad. The many academic and practical contributions over the past 20 years have made the BSC a relevant and popular management tool until today.

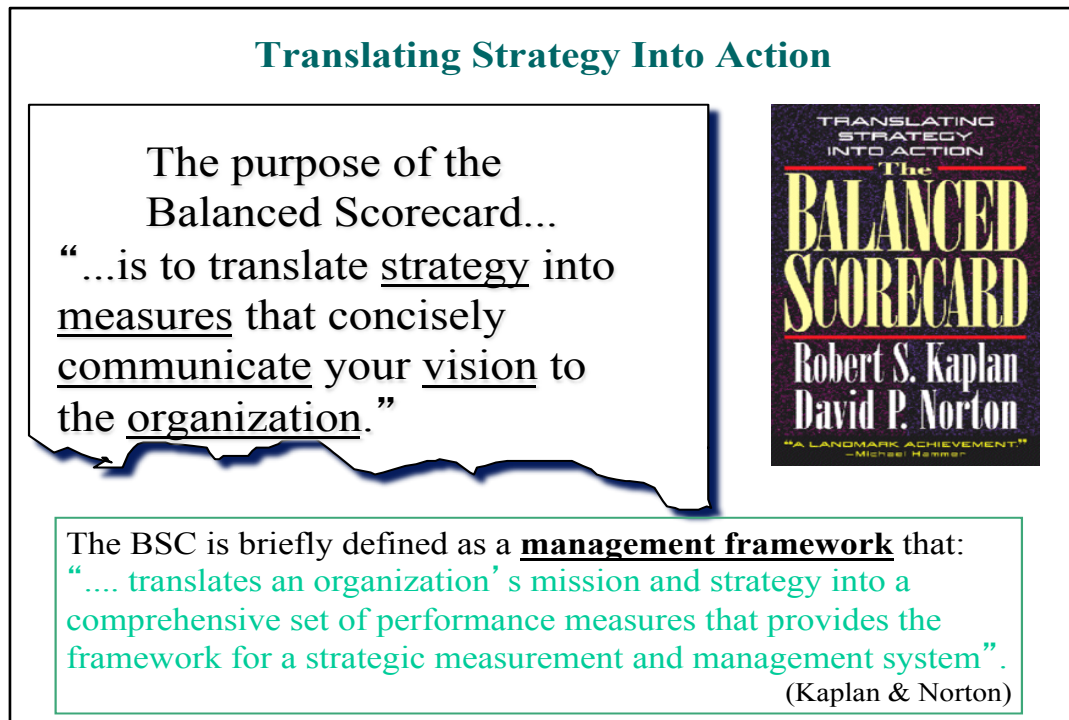


Figure 2.11

Purpose and Definition of the BSC (Kaplan & Norton, 1996)

However, the researcher views that the core ideas and concepts are mainly found in the first book that described the BSC in detail (Kaplan & Norton, 1996) and the work on the strategy focused organization (SFO) (Kaplan & Norton, 2001). The work on mapping and modelling (Kaplan & Norton, 2004) details out the second principle of the SFO; translate the strategy into operational terms. The work on aligning and communicating (Kaplan & Norton, 2006) details out the third principle of the SFO; align the organization to the strategy. It also addresses part of the fourth principle of the SFO; motivate to make strategy everyone’s job. The latest book (Kaplan & Norton, 2008) tries to propose a full-fledged strategy execution management system but really expands and combines the many ideas, techniques and best practices learned from the many case studies over the years into a rather well-designed and complete process manual for strategy management. Norton (2008) stressed that the BSC concept defines an economic framework for strategy and the SFO defines the philosophy of strategy management.

2.2.2 Summary of BSC and SFO

Figures 2.12, 2.13 and 2.14 summarize the key ideas and terminologies in the BSC. Vision and strategy lies at the heart of the BSC as a strategic performance measurement system (PMS) as opposed to other operational or functional scorecards,

a distinction that is often repeated in (Kaplan & Norton, 1992, 1996). The original concept of balance is to measure the strategic performance of the organization through four perspectives; financial, customer, internal process and learning and growth.

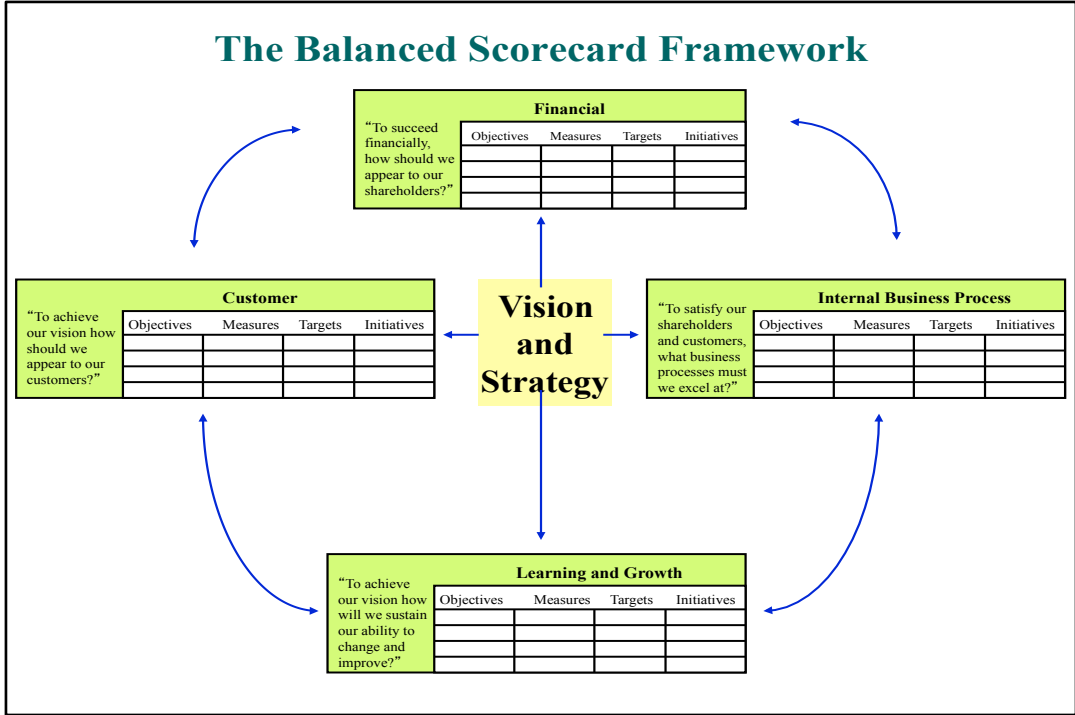


Figure 2.12
Summary of the BSC Framework (Kaplan & Norton, 1996)

Financial measures provide an excellent review of what has happened in the past, but they are inadequate in addressing the real value-creating mechanisms in today's organizations – the intangible assets. They are also lag indicators; showing outcomes of actions previously taken that are known after the fact. The BSC complements these lag indicators with the drivers of future performance, or lead indicators. But from where are these performance measures (both lag and lead) derived? All the measures on the BSC serve as translations of the organization's strategy. Thus, vision and strategy are at the center of the BSC system, not financial controls.

The BSC thinking introduced additional order and structure when they described dependencies among the groupings of strategic objectives. They called these groupings 'perspectives' and described a hierarchal sequence where accomplishing strategic objectives in one perspective contributes to the success of accomplishing the strategic objectives in the dependent perspectives. The four popular perspectives that are defined and sequenced for the scorecard are:

- i. The financial perspective uses traditional accounting measures in order to evaluate a company's financial outcomes.
- ii. The customer perspective measures customer outcomes like satisfaction and retention of identified target customers and is generally market-focused.
- iii. The internal process view is based on the concept of the (firm-internal) value chain.
- iv. The final learning and growth perspective covers the 'soft' side measures describing organizational development and learning as well as people development and learning. Another way to think of this perspective is as enabling assets, including not only people but also technologies, leadership, culture and work values that characterize the company.

By combining measures across these four perspectives within the BSC, Kaplan & Norton attempted to establish the BSC as a representation of an organization's strategy and shared vision. In doing so, the BSC becomes not only a tool for measurement, but also a tool for strategic management. It follows that the BSC focuses attention to activities and performance areas that are measured, since what is measured can be evaluated and what can be evaluated can be appraised. Managers, in turn, will try to maximize performance in those areas that are measured and evaluated, even at the cost of neglecting other fields that are not included in the performance measures. By clarifying the organization's strategy, the BSC sets out to efficiently align the organization with a defined strategy towards which managers can align their actions and efforts. The systematic way in which the BSC is designed helps and leads managers to prioritize important issues more easily. Also, by trying to include future oriented measures, long-term planning is encouraged.

The first perspective, financial, inherently contains lag or outcome measures. The other three perspectives, which collectively are the components for value creation, are each individually comprised of both lag and lead indicators for each strategic objective. A lead indicator is a measure that has a causal effect on time-lagging indicators. Lead indicators are valuable to track because merely sanctioning and reporting them serves to drive behaviour, which provides dynamism in monitoring the progress of strategy implementation.

These four perspectives create a more balanced and wholesome view of organizational performance. Kaplan and Norton (2000) reasonably concluded some

arguments, criticisms and discussions about the number of perspectives and also the classification of the perspectives. However, many mistakenly view that these four perspectives form the core concept of the BSC. Others had previously proposed the measurement of company performance in non-financial terms (Eccles, 1991). Companies had already been measuring non-financial indicators such as customer satisfaction, cycle times, market share, employee satisfaction, employee training, product quality and service quality. Parker (1979) had already described more than 30 years ago a balanced view on companies' operations and performance, including financial as well as non-financial measures, related to marketing, research and development, social responsibility and employees. Thus, just having additional perspectives is not sufficient and appears rather simplistic as a new balanced paradigm in performance measurement. But this was the first time that performance measurement was proposed in an integrated, causal and systematic way. The BSC now provided a multi-dimensional view of the firm, linking financial and non-financial measures in a coherent system. The other key concept of the BSC is the need to have a consistent cause-and-effect relationship between these different perspectives and the strategy. Figure 2.13 shows that it is not simply about having other perspectives apart from the traditional financial perspective, although that is important, but how the components of each of the perspectives (objectives, measures, targets and initiatives) relate to one another. This causality is not easy to prove empirically since the BSC was developed from a multi-company study (Voelpel *et al.*, 2006), but the concept is obviously needed for consistency.

What really separates the BSC from other performance management systems is the notion of cause and effect, which is constructed with a series of 'if-then' statements. It appears to be the more challenging aspect of BSC design. Figure 2.13 tries to explain the cause and effect relationship. Beginning with the strategy the BSC thought process starts by asking what the financial strategic objectives are. The company may predominantly choose a financial growth strategy and perhaps focus on revenue growth and mix in the form of new products, new applications, new customers and markets or new pricing options. The company may strategically decide on financial sustainability and perhaps focus on a combination of cost reduction and productivity improvement like reducing unit costs, improving the channel mix and reducing operating expenses. Once the financial strategic objectives have been set, the BSC causal relationship asks what strategic objectives must be set

within the customer perspective to achieve the determined financial growth strategic objective. Based on the choice CVP, a product-based company can obviously grow financially by creating and selling new products and services and expand into new customer segments and geographic markets. The company following the customer-intimacy strategy will look for financial growth by solving additional needs and problems of their existing customers or by securing newer customers. Thus a specific financial strategic objective and a specific overall strategic CVP causes the company to choose different customer related strategic objectives. Upon setting the customer perspective strategic objectives, the cause logic will be used to determine the processes that the company must excel at to deliver the customer and financial related objectives. As an example, new products related strategies require the company to excel in innovation and new product development (NPD) related processes. Strategies based on solving customer needs and wants should lead the company to excel in customer management processes that enhance customer value.

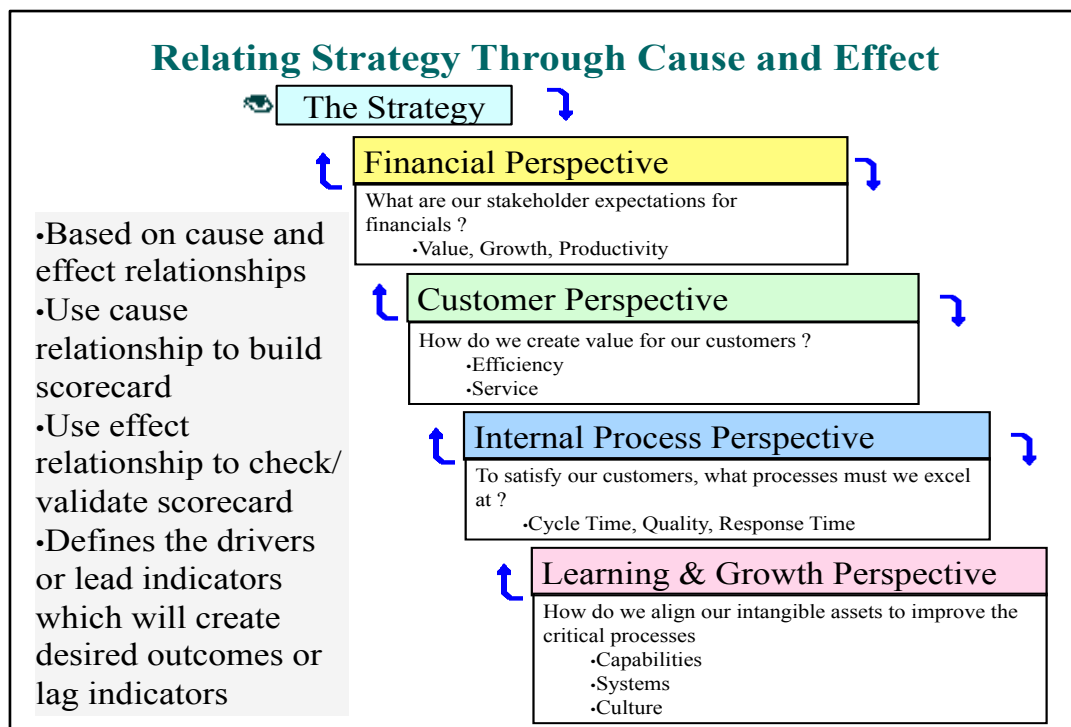


Figure 2.13
BSC Cause and Effect Relationship

Once the strategic processes are determined, the company must then align its intangible assets involving people, organization, information and knowledge to help them excel in the selected processes. The generic Learning and Growth perspective covers the customization and alignment of people skills and competencies, use of technology and organizational assets like leadership, teamwork, culture and values,

to build the company's strategic processes and capabilities. The skill sets, choices of technology, culture and value traits are no longer generic but strategically chosen and developed to support the key strategic processes. Figure 2.14 shows how the specific CVP strategies lead to different processes for which the company need to be great at, which in turn leads to an integrated combination of different skills, technologies, culture and values (Kaplan & Norton, 2004).

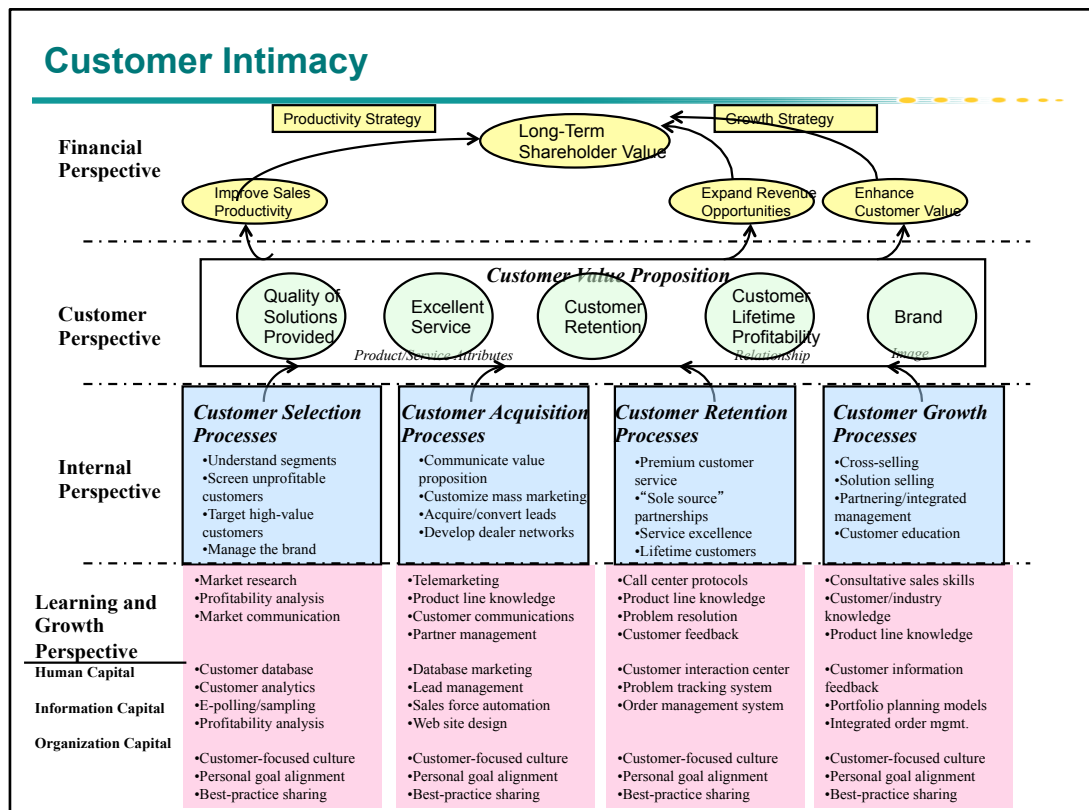


Figure 2.14
Strategy Map on Managing Customers (Kaplan & Norton, 2004)

The cause and effect relationship concept is central to the BSC. It tries to ensure qualitative consistency between the various strategic objectives from the different perspectives. The cause relationship is used to build the BSC while the effect relationship is used to check and validate the scorecard design. The various strategic objectives from the different perspectives are visually represented through a strategy map as shown in Figure 2.14 (Kaplan & Norton, 2004, p. 123). The completed strategy maps normally use arrows to show how a strategic objective has an effect on other strategic objectives. The strategy map provides a visual representation of the organization's strategy and is an important concept and tool of the BSC. At first the design of a strategy map was a mere part of the elaboration of the BSC, but the relevancy of this process has grown, and now it is one of the central themes of the

BSC. This was to be expected because the combined use of the BSC with strategy maps ensures that the effectiveness of the strategy is constantly monitored (Kaplan & Norton, 2004). The concept of a visual strategy map is an important contribution to how firms can clarify the strategy. Kaplan and Norton (2000) emphasized that strategy implies the movement of an organization from its present position to a desired but uncertain future position. Since it has never been to this future position, the pathway to it consists of a series of linked hypothesis. The strategy map shows these linked cause and effect relationships, which makes them explicit and testable. Without these links and relationships, there is only an ad-hoc collection of financial and non-financial objectives and measures. “We now realize that the strategy map, a visual presentation of the cause-and effect relationships among the components of an organization’s strategy, is as big an insight to executives as the Balanced Scorecard itself” (Kaplan & Norton, 2004, p. 9).

The map of linked strategic objectives in the four perspectives often promotes much greater clarity and commitment to the strategy (Kaplan & Norton, 2004). The financial and customer objectives describe the outcomes the organization wants to achieve; objectives in the internal and learning and growth perspectives describe how the organization intends to achieve these outcomes.

In addition to the core concepts of different perspectives, linkage to vision and strategy, cause and effect relationship and the strategy map, Figure 2.15 summarizes the remaining key terminologies related to the BSC. Measures and the associated targets are quantitative indicators on how success in achieving the strategy will be measured and tracked. The BSC started as a performance measurement system and measures still play a central role in the BSC (Kaplan & Norton, 2010). The BSC best practice mandates that every objective must have at least one quantitative measure (Kaplan & Norton, 1996). Kaplan and Norton (2008, p. 35-101) discussed many elaborate techniques and steps on strategy analysis and formulation, it finally leads to a list of strategic issues with detailed strategic themes, objectives, measures and targets. Strategic initiatives represent the how. “Newton’s First Law applied to organizations states that an organization at rest will remain at rest. Newton’s Second Law states that a force is needed to accelerate a mass into motion. Strategic initiatives represent the force that accelerates an organizational mass into action” (Kaplan & Norton, 2008, p.103).

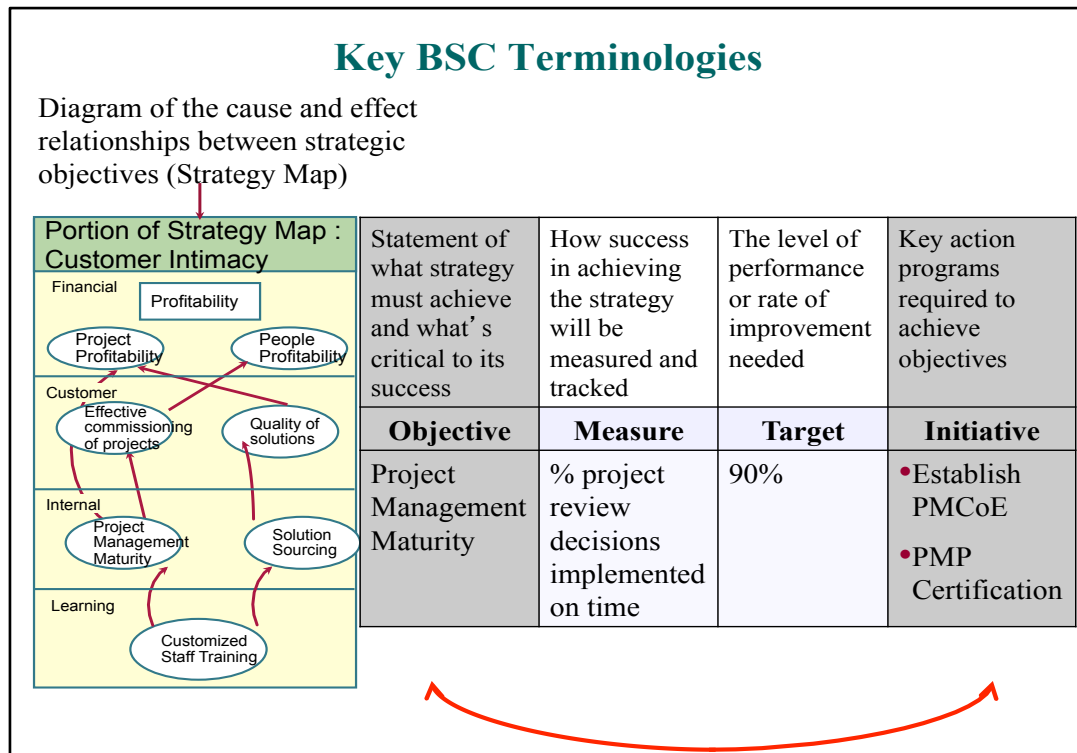


Figure 2.15

Summary of BSC Components

Initiatives are key action programs or projects required to achieve the longer-term targets associated with each measure that is related to the particular objectives. One of the example objectives in Figure 2.15 is to improve the project management maturity of the sample company for which the stated measure is the percentage of decisions made during the project review sessions that are implemented on time. If the current performance level is say 50 percent and the desired future target is 90 percent, the company must implement an intervention program to close the performance gap. The example quotes two programs that can help the company achieve the higher target; increasing the number of project managers with Project Management Professional (<http://www.pmi.org>) certification and to establish a Project Management Center of Excellence. As such, initiatives are related to the measures and targets that are in turn related to the specific strategic objectives. In reality, some initiatives may be also related to other objectives. There must then be a direct cause and effect relationship between the objectives and initiatives. The arrow at the bottom of Figure 2.15 proposes a vital observation by the researcher after many years of experience in implementing the BSC. Measures describe the objectives quantitatively but strategic initiatives are the real drivers of action that help achieve the objectives. Managing strategy is made actionable by managing

initiatives. **As such, one can implement strategy without needing measures but by just monitoring the implementation of the related causal strategic initiatives.** This will greatly simplify strategy implementation and make strategy actionable since initiatives are tangible programs and projects. It also reduces the time, resources and costs involved in strategy implementation since developing measures and actually producing the quantitative reports do take significant effort. There are other criticisms related to measures that will be discussed in a later part of this review of the BSC. One of the problems to be addressed in this research is to overcome some known difficulties in managing strategy for SMEs. **This observation that managing strategy is essentially managing action programs and projects forms a significant conceptual contribution to the proposed strategy framework.**

The researcher would like to conveniently summarize the key concepts and terminologies related to the BSC. It involves

- i. V and S: the future vision of the company and the strategic choices made to achieve the vision
- ii. 4Ps : describing the strategy through strategic objectives across four different perspectives of the business
- iii. C and E: linking the above through a cause and effect relationship
- iv. Strategy Map : drawing a visual representation of the strategic objectives across four different perspectives and how they are related
- v. M and T : translating the described strategic objectives in terms of measures and targets that can be tracked and monitored
- vi. I : determining the strategic initiatives that must be successfully implemented to achieve the related set of strategic objectives and thus effectively realizing the vision.

From the above summary and the way it is presented, it appears quite obvious that a critical analysis of the above components in terms of its necessity, importance, practical problems and adaptability, can perhaps lead to a more simplified framework of strategy management.

2.2.3 BSC Criticisms

Although the BSC is considered as a very useful tool in enhancing the understanding of strategy in terms of visual cause-effect relationships and in translating qualitative ideas related to strategy into measurable numbers and actionable initiatives, the BSC literature does include valid criticisms against some of its concepts and the many problems related to its implementation.

Some of the early researchers (Neely *et al.*, 1995; Butler *et al.*, 1997; Dinesh & Palmer, 1998; Epstein & Manzoni, 1998; Schneiderman, 1999; Bontis *et al.*, 1999; Norreklit, 2000; Kennerley & Neely, 2002; Olson and Slater, 2002) have criticized its concept. They have argued that it fails to identify performance measurements as a two-way process, since it focuses only on top-down performance measurement. Also the BSC does not address the question of what one's competitors are doing. BSC also seems to ignore other important parts of the company, such as the employees, suppliers, alliance partners and community, i.e. it does not consider the extended value chain. It does not adequately highlight the contributions of employees and suppliers toward company strategic objectives. The role of the community and environment within which the company works is also not made prominent.

Some of these criticisms are addressed in the later works (Kaplan & Norton, 2004, 2006, 2008) particularly on the role of the employees for which some detailed framework on human capital has been proposed. The role of the community has also been addressed in a general way through the emphasis of managing regulatory and social processes as part of the generic strategy map template (Kaplan & Norton, 2004). If the role of external influencers like competitors, suppliers and alliance partners is deemed strategic to a company, (Kaplan & Norton, 2004) suggested that an additional perspective can be incorporated in the company's strategy map indicating that the BSC concept can be adapted to include components that may not appear in the standard generic BSC framework while maintaining consistency with its underlying concepts.

(Marr *et al.*, 2004) criticized that the Learning and Growth perspective, which is where the non-process related factors for innovation like culture and skills are supposedly addressed, is the weakest link in the BSC. Frigo and Krumwiede (1999) reported that the majority of BSC users rate the effectiveness of the Learning and Growth perspective from 'less than adequate' to 'poor'. Speckbacher *et al.* (2003)

discovered that over 30 percent of the BSC users covered in their study have no Learning and Growth perspective. Kaplan and Norton (1996, p. 144) admitted that “this gap is disappointing since one of the most important goals for adopting the scorecard measurement and management framework is to promote the growth of individual and organizational capabilities”.

Norreklit (2000) argued that the general causality logic of the BSC and strategy maps by implication is flawed. Cuganesan and Dumay (2009) also mentioned that although Kaplan and Norton (2000, 2004) argued that the value of intangible assets can only be evaluated in light of their effects on critical business processes, this view has been criticized. Marr and Schiuma (2003) commented that the focus on how intangible assets influence business processes is said to exclude a consideration of interdependencies between the intangible assets themselves. Also, the BSC model does not address the interdependencies between the resources within the company. The researcher has gone through many projects on developing the BSC and has seen customers face difficulties in relating the objectives and measures under the Learning and Growth perspective to the objectives in the other perspectives. The generic concept seems easy but working out the details for a specific case is challenging.

The most scathing attack on the BSC is probably the work done arguing against its usefulness for the innovation economy (Voelpel *et al.*, 2006). This criticism is of relevance for this research since it also addresses the innovation economy. They firstly claimed that the four perspectives of the BSC are mainly focused on a single organization and do not take the activities of the related industry sector into account. Although the customer perspective does take external players into account, it remains focused on what is the individual company's CVP. These days, companies can be so interconnected with other companies in their industry sector and supporting industries that there is no need for them anymore to own the physical resources necessary for producing the products and services they sell. Chesbrough and Teece (1996) discussed these virtual organizations. For such examples, the limitations of the current BSC approach become obvious since the single company focus would not take sufficient account of these important external factors. The BSC, with its systematic single company focus, is incapable of serving these newly evolving needs.

Voelpel *et al.* (2006) second criticism is on the static nature of the BSC that tends to struggle with the challenges of a competitive and changing business world. Within the BSC approach, a centrally defined strategy is translated into specific

measures that align all company activities toward achieving its BSC strategic objectives. As such, the optimal implementation of a BSC leads to a high level of uniformity and vision orientation. This increases the focus on the given vision; but might limit any further activities and initiatives that may go beyond the originally set objectives, measures and targets. In such an aligned organization employees might have a clear understanding of their job by working hard to achieve the targets of the BSC related measures, but they may only achieve just these. Thus, the overall potential that resides within an organization is reduced towards the achievement of a given and centrally defined BSC vision, and towards this end it is very efficient. However, the overall potential is not fully used. An individual as well as an organization is able to deploy its potential in many ways, of which the BSC measures are just one aspect. The rest remains under-utilized and the company as a whole, therefore, becomes inefficient because of under-utilizing the potential that would be available beyond mere BSC targets. Dynamic companies, in contrast, are open-ended and able to partly absorb and renew the energy residing within a company or a business network. In this way an organization can constantly rejuvenate in co-creative collaboration with others.

Thirdly, the external innovative connectivity of an organization is hindered by the BSC, which is mostly an internal document. There is a critical limitation in its ability to account for the external environment and linkages. The BSC is a management and measurement tool that is mainly concerned with driving performance and translating strategy into action efficiently within an organization. It widely ignores the needs of an interlinked and highly networked innovation economy where companies, cities and even countries work with and compete against each other (Apple and Samsung is a very recent case). Companies are today embedded in a networked economy that consists of many other players such as suppliers, local communities, alliance partners, worker unions, and the final customer, who seems to be the only external constituent accounted for by the BSC. The BSC is based on the view of the company in relative isolation with other organizations within their industry. Such limitations will become more obvious the more a company has to deal with rapid and disruptive change as well as a globally networked environment.

Fourthly, the BSC follows the traditional logic of innovation through internal R&D which works on an innovation from its beginning to its end. Kaplan and Norton (2004) viewed innovation as one of the internal R&D processes in the company that

moves sequentially from identifying the opportunities through design and development, leading toward launching of the products and services. The nature of innovation today is however changing from being incremental towards being more and more disruptive, from closed to open, and becoming increasingly networked. In the past, internal R&D departments were effective innovation instruments for large corporations, simultaneously keeping competitors from entering the market. The new era of the knowledge economy demands more open forms of innovation (Chesbrough, 2003). It is not easy to measure such distributed innovation. Another limiting view toward innovation is how the BSC views it as an internal business process and categorized under this perspective. Innovation appears to be a routine mechanistic process rather than a creative endeavour by skilled employees throughout the company. Bontis *et al.* (1999) suggested that such a mechanistic BSC view of innovation leads to difficulties in managing certain aspects of corporate life, such as promoting dynamic innovation and knowledge creation. Good measurement systems need to acknowledge that innovation has to be practiced in all business areas.

Fifthly, the BSC is grounded in a process mindset with ever more detailed tools provided (Kaplan & Norton, 2008; Palladium, 2010). Organizations with a bureaucratic and hierarchical structure, in which detailed job responsibilities are still clearly defined, might very well benefit from a BSC that provides a rationalistic, methodical approach to management. However, as business processes become more complex, an understanding of most of the key success factors within an organization needs to take cross-perspectives into account. Simple cause-and-effect relationships are not sufficient anymore to understand complex relationships that the BSC tries to reduce to a linear one-way relationship. For example, customer satisfaction may be linked to various factors such as employee satisfaction, quality service, delivery time and so forth. However, customer satisfaction might also enhance employee satisfaction, which in turn might influence service quality positively and so forth. Thus, the problem of how to link the objectives and measures of the BSC remains unsolved (Andre'asson & Svartling, 1999). The predominant mindset connected to the application of the BSC is process oriented and linear, making it difficult to deal with an interconnected and networked world. Today's business reality involves non-linear and interactive activities that consider the entire system, not only the direct and

visible factors, but also those that reside unseen within the environment in which they take place.

The BSC process may be relatively rigid since the cause-and-effect relationship tends to limit strategy planners to think along the four perspectives. Those that do not fit, or cannot be categorized, within the given framework of the four perspectives are in danger of being uncared for. The strategy map template (Kaplan & Norton, 2004), although helpful, tends to constraint BSC implementers from being creative in drawing the strategy map so as to remain compliant to the BSC standard. This draws strategy planners away from other possible perspectives and views that might provide a better picture of the actual business of the organization. This limiting and guided thought process ignores the dynamics of today's business environment.

Many of these conceptual criticisms have their merits. The BSC was developed from a multi-company study and the subsequent follow-up work also used case studies. It is not easy to model a complete framework for strategy based only on case studies and postulate that the model can be relevant to all organizations. It is obvious that adjustments and adaptations must be made when the BSC is being implemented for a particular organization. Kaplan and Norton (2004) also proposed adjustments to the strategy map framework for government and non-profit organizations by renaming and repositioning perspectives as shown in Figure 2.16. The researcher views that organizations can benefit from the richness of the BSC by selecting aspects of the BSC design process and adapting the concepts to suit the needs of the organization. The variety and success of these adaptations will be discussed in a later section of this review.

In addition to the conceptual problems, there are many other issues related to the implementation of BSC. Drawing from Bourne *et al.* (2002, 2003), the main reasons for success and failure of the BSC include context related issues like the need for a highly developed information system (Bierbusse & Siesfeld, 1997), time and expense required (Bierbusse & Siesfeld 1997; McCunn, 1998) and lack of leadership and resistance to change (Hacker & Brotherton, 1998). Then there are process related issues like the vision and strategy were not actionable (Kaplan & Norton, 1996) as there were difficulties in evaluating the relative importance of measures. There were also problems of identifying true 'drivers' (Bierbusse & Siesfeld, 1997; Schneiderman, 1999). Kaplan and Norton (1996) highlighted the issue that strategy was not linked to resource allocation. Schneiderman (1999) also pointed out that

objectives and measures were negotiated rather than based on stakeholder requirements and that striving for perfection undermined success.

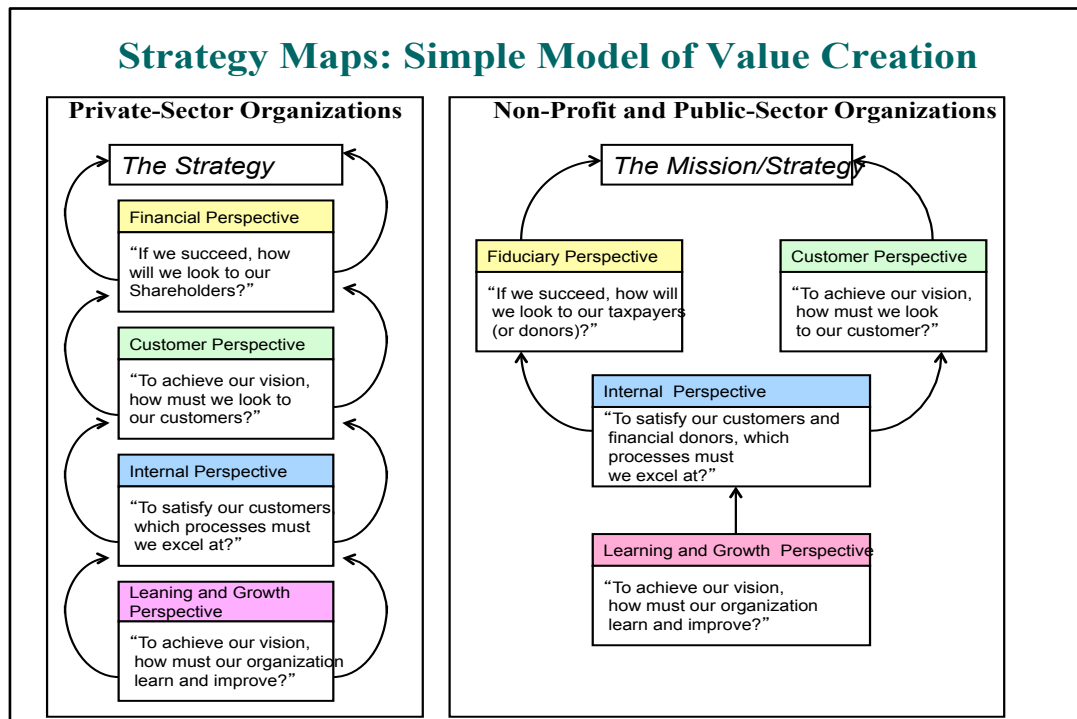


Figure 2.16

Adaptations of the Strategy Map (Kaplan & Norton, 2004)

Content related issues include strategy not being linked to department, team and individual goals (Kaplan & Norton 1996; Bierbusse & Siesfeld, 1997; Schneiderman, 1999), large number of measures diluting the overall impact (Bierbusse & Siesfeld, 1997) and metrics being too poorly defined (Schneiderman, 1999). Bierbusse and Siesfeld (1997) highlighted the content related problem of trying to comply the need to quantify results in areas that are more qualitative in nature. This hints to the emphasis on quantifying metrics leading to poorly defined metrics just for the sake of compliance to the BSC process.

The final major category of issues relate to project specific implementation factors. This includes that effort and time required for implementation, the ease of data accessibility through the IT systems and the BSC project being overtaken by parent company projects or other demands on the company.

Other implementation barriers include difficulties in evaluating the relative importance of measures and the targeted problems and in decomposing goals for lower levels of the organization (Schneiderman, 1999; Bierbusse & Siesfeld, 1997).

Rompho (2011) summarized from Kaplan and Norton (2000) two sources of the failure of the BSC in large companies: the design and the process. A poorly designed BSC includes:

- i. Too few measures in each perspective, leading to failure to obtain a balance between lead and lag measures or financial and non-financial measures.
- ii. Too many measures without identifying the critical few: in this case, the organization will lose focus and be unable to find the relationship between measures.
- iii. **Failure of measures** selected to depict the organization's strategy. This happens when an organization tries to input all its measures into each perspective without screening to select only those measures linked to its strategy. This means the organization's strategy is not translated into action and it thus does not obtain any benefit from the BSC.

Process failures are the most common causes of failure of the BSC and include; lack of leadership commitment, too few individuals being involved, keeping the scorecard at the top, overly long development process, treating the BSC as a one-time measurement project, treating the BSC as an IT systems project, hiring inexperienced consultants, and introducing the BSC only for compensation. The underlying factor behind these failures is ineffective communication within an organization which limits those who understand the concept and benefits of the BSC, thus they may even oppose it (Kaplan & Norton, 2000, p. 361).

2.2.4 BSC Criticisms: Problems Related to Implementation Period

From the literature, it appears that the application of the BSC as a full-fledged strategic management system would take approximately 25 to 26 months to progress from clarifying the vision to the point at which individual performance is linked to the BSC (Kaplan & Norton, 2000). Another reference indicated that a BSC development plan would take 20 weeks for governmental and nonprofit agencies to go from a planning phase to the development phase (Niven, 2003). Bourne *et al.* (2000) mentioned that in their study of successful implementations of the BSC, it took between 15 to 26 weeks to design and develop the measures and a further 9 to 13 months for the implementation. Several authors have suggested a number of steps

for the successful development and implementation of the BSC (Becker *et al.*, 2001; Niven, 2002; Niven 2003). In general, the consensus appears to be that an organization needs to develop a mission and a vision with an end state in mind (a strategy); to have stakeholder buy-in; to identify resources; to adopt a methodology including how data would be gathered, what would be measured and how, what analysis would need to be done; to develop a plan of action including training and communication activities and to set up a monitoring mechanism and a means of sustaining the BSC implementation. The rather long development period of about two years can probably be phased to allow for partial implementation, but the process does require significant time. This is a major shortcoming for companies in fast moving industries and those that need to make dynamic adjustments to their plans and strategies. The time and effort required to go through the processes may seem daunting particularly for SMEs.

Problems with the IT systems and the effort required can be overcome. This suggests that some problems are simply hurdles to implementation rather than factors that completely stop the project (Bourne *et al.*, 2002). The impact of parent company initiatives is a significant factor not previously recognized in the literature.

Leadership commitment is widely taken as a major factor influencing the success and failure of project implementations (Bourne *et al.*, 2002; Frizelle, 1991). Hacker and Brotherton (1998) cited the classic problems found in the management of change literature – lack of leadership and resistance to change. Their solution is to focus on pushing the change through, requiring employees to adopt the change and not being derailed by IT systems and data integrity problems. They also suggested using standard reporting to save time and effort.

(Bourne *et al.*, 2003) claimed that although the available literature on change management provides general advice about how change should be implemented and why change fails (Kotter, 1996), there is a lack of research based studies of performance measurement system implementations and its impacts on organization change. They referred to the comprehensive study by (Frizelle, 1991) that showed there are company general attributes, project general attributes and project specific attributes. The company and project general attributes (such as top management commitment, a perceived need for change and involving the end users) are well known attributes promoted in the change management literature. However, the project specific attributes for performance measurement are not.

Many of the factors causing problems for implementation (e.g. strategy and vision not actionable and measures poorly defined) could be attributed to a poor design process. A better designed and executed process can overcome these implementation issues.

2.2.5 BSC Criticisms: Problems Related to Measures

It is interesting to note that some of the criticisms against the BSC that appear in the academic literature are related to measures. Bourne *et al.* (2002) highlighted that the problems regarding measures include large number of measures diluting the overall impact of the scorecard and metrics being too poorly defined. The need to quantify results in areas that are more qualitative in nature contributed to the above two problems.

In reviewing the full list (Bourne *et al.*; 2002, 2003), the majority of the items are process and measurement content issues; the very issues that the BSC, as a performance measurement system, is specifically developed to address.

Micheli *et al.* (2011) mentioned that in the important effort to improve strategy implementation and to promote strategic alignment and communication within organizations, PMS could be introduced (Kaplan & Norton, 2004; Neely *et al.*, 2002). Indeed, one of the main purposes of implementing PMS, such as the BSC, is to communicate strategy throughout the organization and link it to departmental and individual objectives (Kaplan & Norton, 1992, 1996). Micheli *et al.* (2011) **also quoted several scholars claiming that a clear articulation of strategy through the use of a PMS, by translating strategy into a set of measures, is not necessarily beneficial.** It could lead to organizational inertia and limit flexibility (Mintzberg, 1993), and the introduction of PMS could hinder change within organizations (Melnik *et al.*, 2010; Townley *et al.*, 2003). Johnston and Pongatichat (2008) have identified several potential benefits of misalignment, not least because the design of PMS requires management commitment, time and effort, which are not always available, resulting in tensions between strategy and measurement. Other researchers have noted that through appropriate use and review of performance measures and targets, it is possible to promote both single- and double-loop learning that favour continuous improvement and organizational adaptation to the business environment (Senge, 1990; Henri, 2006; Neely & Al-Najjar, 2006). **These studies indicated that**

what is perhaps more important is the qualitative learning for continuous improvement and organizational adaptation to the business environment. Measures can help to promote this learning but may not be crucially important in articulating and implementing strategy. This observation from the literature suggests a bold proposition that one can do without the need of a rigorous measurement system in developing and implementing strategy. This will remove many of the measurement related issues that were mentioned earlier, reduce the time and effort in strategy development and implementation and generally simplify the related processes.

In a review of performance measurement in the service sector, Yasin and Gomes (2010) utilized a database of 141 peer-reviewed publications between 1981 and early 2008. This paper concluded that the area of research related to performance measurement in the service sector as compared to the manufacturing sector is in need of more future efforts aimed at developing theoretical constructs and practical applications. It also highlighted there are many costly piece-meal and me-too practices in PMS implementations. This again shows that measurement systems implementation are costly and do not necessarily add significant value.

2.2.6 Use of BSC for SMEs

Literature reporting on the uses and limitations of the BSC in SMEs is rare (Rompho, 2011). Most SMEs are not aware of this technique and the usage rate is very low compared to large organizations (Tennant & Tanoren, 2005). At the same time, the BSC is believed to be as beneficial for SMEs as it is to large organizations (McAdam, 2000a; Andersen *et al.*, 2001; Kaplan & Norton, 2000). However, there are very few studies that reveal the limitations of its application in SMEs, which may be due to the limited application of this method in SMEs.

Since the BSC is an example of a performance management system (PMS), factors that can be obstacles to PMS implementation in SMEs may apply to BSC implementation in SMEs. Rompho (2011) mentioned that these factors include limited human and financial resources, lack of supporting software, lack of strategies resulting in short-term orientation, and no formalization of the processes.

In a more specific study of PMS for SMEs, Cocca and Alberti (2010) identified the main shortcomings of the PMS currently used by SMEs, and provided an

overview of the evolutionary path of PMS in SMEs. **The results of the survey showed that the main weaknesses of PMSs in SMEs concern the scope of measurement and data collection and storage.** SMEs seem to suffer from lack of data apart from financial data and from the lack of satisfactory IT infrastructure. Other difficulties in managing the PMS are related to the communication and use of performance measures. Also, poor quality of the performance measurement processes has been highlighted. Again this study substantiates the problems and difficulties of relying on measures to improve the performance of SMEs.

Norhayati and Siti-Nabiha (2009) revealed some interesting findings in studying the BSC implementation as a PMS in a Malaysian government linked company. Despite attempts to link the company activities to the PMS through the business operating plan, the data reveal that the PMS-related activities have somehow been viewed as a routine mechanism for appraising the employees' performances and become decoupled from the organizational activities. The new PMS did not change the way the staff viewed and did things in the company. This provides some evidence that the process involved in transforming the organizational culture of a government-linked company by using accounting tools might be **time consuming, costly** and subject to resistance. Almost similar to Siti Nabiha and Scapens (2005) and Othman *et al.*, (2006), Norhayati and Siti-Nabiha (2009) found that most employees did not feel accountable to the performance measures included in the BSC. The authors further argued that Malaysian culture and leadership styles are in conflict with the human relation norms needed for the successful implementation of the BSC. Thus, Malaysian organizations might have problems implementing the BSC.

The above findings from the literature and its analysis suggest that in developing an easier approach for strategy management and SMEs, the role of measures need to be critically examined since it cannot be easily implemented within SMEs. Clearly there are problems in implementing the measures portion of BSC and other measurement systems even in large organizations. The related problems are even more acute for SMEs. The researcher suggests a **bold proposition that one can do without the need of a rigorous measurement system in developing and implementing strategy.** Doing away with rigorous and methodological measurement systems will remove many of the measurement related issues that were mentioned earlier, reduce the time and effort in strategy development and implementation and generally simplify the strategy management process for SMEs.

Obviously the trade-off will be the lack of quantitative data in monitoring the progress of the strategy implementation.

2.2.7 BSC Evolution and Adaptation

The BSC has come a long way since its introduction and has had its fair share of criticisms and negative remarks. It still remains one of the more popular and widely used management tools (Rigby & Bilodeau, 2011). Although widespread adoption, user satisfaction, and executives' perceptions of performance are useful indicators, it is more convincing to have empirical, quantifiable evidence of the BSC's effectiveness in creating organizational value. Crabtree and DeBusk (2008) analysed the share price performance of more than 160 public companies, those that used and did not use the BSC, matched by industry, size, and other criteria, over the BSC users' three-year post-adoption period. Companies that used the BSC outperformed those that did not across three measures of performance; market value of equity, book-to-market ratio, and net assets, by an average of 28%. They concluded that companies using the BSC outperformed those that did not over a three-year period from the year of adoption. These provide empirical evidence for the BSC as an effective strategic management tool.

The researcher believes that the continued evolution of the BSC concept and its adaptability through different and varied application cases ensures its continued relevance. Kaplan and Norton (1992, 1993) had originally understood the scorecard as a performance measurement tool and first devised the BSC as a measurement framework for strategy. Kaplan and Norton (1996) pointed out that basing a scorecard on vision and strategy has the advantage of limiting objectives and measures to a manageable number. This helps an executive focus his time and effort on those objectives and measures that will take the organization forward to its future vision. It is this imperative that distinguishes a strategic scorecard from an operational scorecard. They conceded that the small number of objectives and measures on a scorecard do not cover all those that an organization needs to run a business. They pointed to a difference between strategic and diagnostic objectives; strategic objectives relate to vision while diagnostic objectives relate to the core areas of the business, which must be continually monitored if the business as a whole is to

be effectively managed. Later on, the scorecards related to the core operations and other functional areas were termed as dashboards (Kaplan & Norton, 2008).

The BSC was then proposed as a strategy management framework through the five principles of the SFO (Kaplan & Norton, 2000). The details of the SFO occupied most of the work by the original authors until today (Kaplan & Norton, 2004, 2006, 2008).

Now the BSC has reached a heavily commercialized stage when the authors teamed up with a formal management consulting company (www.palladium.com) and introduced certification standards, software standards and a more practical approach of how to link strategy to operations (Kaplan & Norton, 2008). It also maintains an annual 'Hall of Fame' for successful users of the BSC-related concepts and practices (www.thepalladiumgroup.com/halloffame). It is evident that an industry of consultants, software programs, books, training programs and others has developed around the BSC. This keeps BSC vibrant as a management idea.

Other researchers also commented on the different definitions of the stages of the evolution of BSC (Morisawa, 2002; Miyake, 2002; Speckbacher, Bischof & Pfeiffer, 2003; Lawrie & Cobbold, 2004). The first generation BSC appeared in the early 1990s and combined financial and non-financial indicators with the four perspectives. At this stage, measurement systems without cause-and-effect logic may also qualify as Balanced Scorecards as long as they show a balance of measures across different perspectives.

The second generation BSC appeared in the mid 1990s and has put some emphasis on cause-and-effect relationships between strategic objectives and between measures (Malmi, 2001), (Speckbacher, Bischof & Pfeiffer, 2003) and (Lawrie & Cobbold, 2004). Morisawa (2002) and Miyake (2002) proposed the view that the key contribution of second-generation BSC was the formal linkage of strategic management with performance management, similar to integrating the BSC as a strategic measurement system to the other principles of successful strategy implementation as articulated by Kaplan and Norton (2000). It became a strategic management tool, usually making use of a strategy map to illustrate the linkage between the various strategic objectives and measures.

The third generation BSC appeared in the late 1990s. It is about developing strategic control systems by incorporating destination statements and optionally two perspective strategic linkage models (Lawrie & Cobbold, 2004; Cobbold, Lawrie &

Issa, 2004). It uses only two ‘activity’ and ‘outcome’ perspectives instead of the traditional four perspectives (Lawrie & Cobbold, 2004). The third generation BSC contained action plans and targets linked to incentives (Speckbacher, Bischof *et al.*, 2003).

Apart from the two-perspective BSC framework mentioned above, there are some BSC frameworks that have more than the original four perspectives or with four perspectives that are not the same as the ones originally proposed. For example, in Kaplan and Norton (2000) the BSC for a public-sector organization has five perspectives, the internal process perspective, the learning and growth perspective, the support legitimizing authorities perspective, the value/benefit of service perspective and the cost of providing services perspectives. Kaplan and Norton (2004) proposed the BSC for non-profit and public-sector organizations with four perspectives, the customer perspective, the internal process perspective, the learning and growth perspective and the fiduciary perspective. Alsyounf (2006) even extended the traditional BSC model to consider other parts of the extended enterprise, including suppliers, employees and the local community. It can be used to highlight the contribution that employees and suppliers make to help the company achieve its objectives. Furthermore, it can be used to identify the role of the community in defining the environment within which the company works. Figure 2.20 is a strategy map of a case study reported recently in a publication edited by the BSC creators (Field, 2011). It seems to tacitly approve an unconventional strategy map that eliminated the four conventional perspectives and instead creating their own version of the strategy map. Thus the number and category of perspectives and also the components of the strategy map are adaptable within the BSC framework.

It is clear than that the core principle of BSC remains balance. In the process of applying the BSC, organizations seek for balance and harmony between objectives, measures and projects that are long-term and short-term, financial and non-financial, factors that affect the individual and organization, internal and external factors, causes-and effects, and results or outcomes and the activities or drivers that lead to the outcomes.

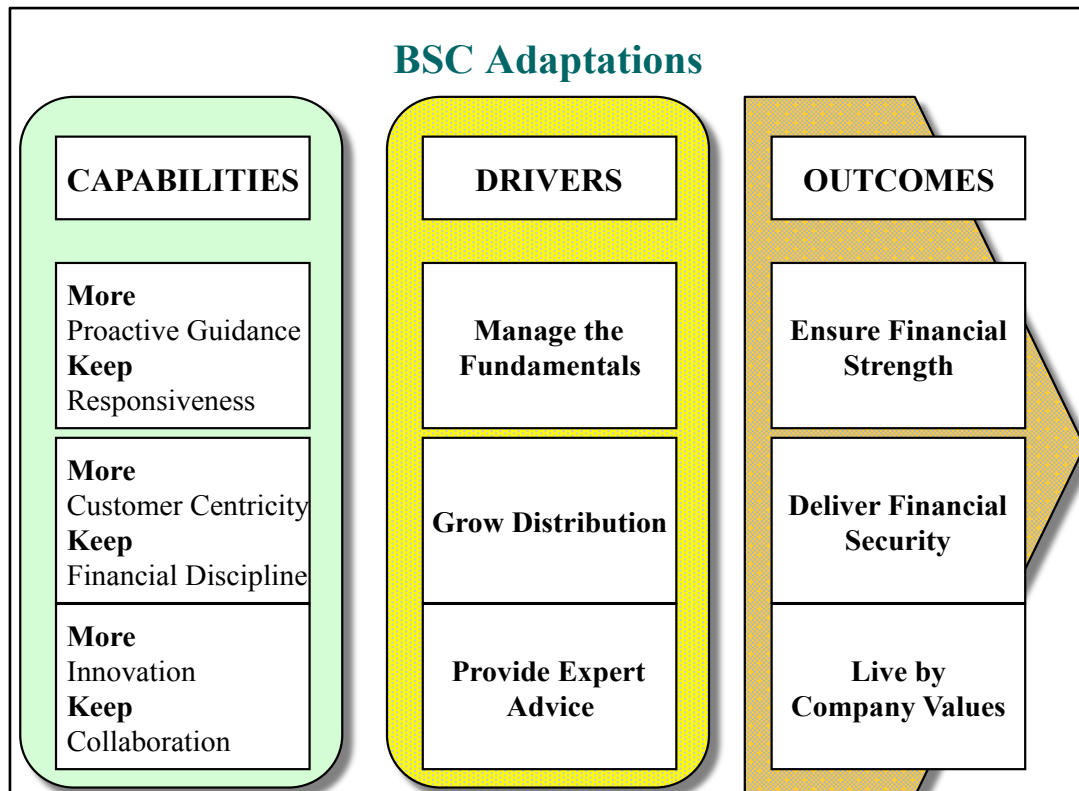


Figure 2.17
Unconventional Strategy Map (Field, 2011)

2.2.8 Integrating BSC With Other Management Tools

It is mentioned earlier that as a generic strategy management tool, the BSC is not biased to any strategy development approach or methodology. The many schools of thought and methods to develop the actual content of the company's strategy are briefly covered in Section 2.1.1. It is interesting to note that a number of academic papers have appeared recently that integrate the BSC with other management tools and models like the integration between BSC and knowledge management (Abouzar & Moshabaki, 2011; Edenius & Styhre, 2008). Wu (2005) reported on the integration of BSC and Intellectual Capital. Othman (2008) studied on enhancing the effectiveness of the BSC with scenario planning. deCarvalho (2008) reported an equally compelling case example of the integrated use of three different, yet complementary, methodologies - the BSC, Blue Ocean Strategy (Kim & Mauborgne, 2005) and Experience Co-Creation (Ramaswamy, 2008; Ramaswamy & Guillard, 2010). There is a report integrating the BSC with sustainability strategy to transform the enterprise (Lubin *et al.*, 2011). Heavey and Murphy (2012) integrated the BSC with Six Sigma. These studies indicate the versatility and adaptability of the BSC as a strategy management tool. In addition, the fact that these papers are quite recent

shows that the integration of the BSC model with other management models is an interesting and current angle of research for contribution to knowledge in strategy management.

These studies strongly encouraged the researcher to explore the integration of the BSC with an emerging management concept, design thinking (DT) in his quest for a simpler framework to solve some of the identified problems of developing and implementing strategy for SMEs. The first attempt to integrate the BSC with design related ideas and concepts used the first generation BSC model and the concept of design management (Borja de Mozota, 2003, 2006). Although other researchers in the field of DT have referenced her work, it has not been further developed. This gap offers the researcher the opportunity to further explore the integration of DT and BSC with the confidence that it is a worthwhile idea originally espoused by an authority in the field of design management and it will be a knowledge contribution to the subject matters of strategy management, BSC and DT among others.

This leads the literature review to the subject of Design Thinking.

2.3 Design Thinking

Before discussing Design Thinking (DT), the target subject matter of relevance to this research, some general points about innovation and its relationship with design and DT will serve as a good introduction. Most of the readings on innovation were mainly drawn from books rather than journal papers with the intention of generalizing broad ideas related to innovation and then relating innovation to design thinking (DT).

2.3.1 Innovation not Invention

Kuczmarski (2011) provided an interesting view that importantly differentiates invention and innovation. It is significant for SMEs with very limited budgets and almost no R&D departments to know and understand that what matters to the business is really innovation and that innovation is certainly important and within the means of SMEs. The implications of knowing these differences are important, otherwise leading entrepreneurs down the wrong path, limiting the growth of existing companies, and wrongly affecting public policy intended to support business. For this research, it is timely to clarify and redefine the difference between invention and innovation to make it clear why the researcher is pursuing the path of innovation to address the defined research problem of the thesis.

Invention is when a new idea surfaces or a new patent is filed. It is the classic inspirational moment when a person has an idea and sets about creating it, putting off concern about who will buy it for another day. Figure 2.18 shows a sample of images from a Google search on ‘most useless inventions’ that include a portable toilet roll holder, shoes with umbrellas, a chopstick with a fan and stick-type butter. At a different level, much of the basic research done in R&D labs in large companies, research centers and at universities relates to the invention process. It is research for the sake of building knowledge and finding something new, which is certainly important, but not done with the initial thought of commercialization to match market needs.

Innovation is when a need is identified and a product or service is developed to meet that need. In business, innovation happens when a product or service is developed to meet a market need or a paying customer’s need. Although people talk about the ‘invention’ of the light bulb or the iPhone, neither Thomas Edison nor

Steve Jobs were inventors. They both used existing technology in new ways with an eye toward a big market. “They were innovators.” (Kuczmarski, 2011).

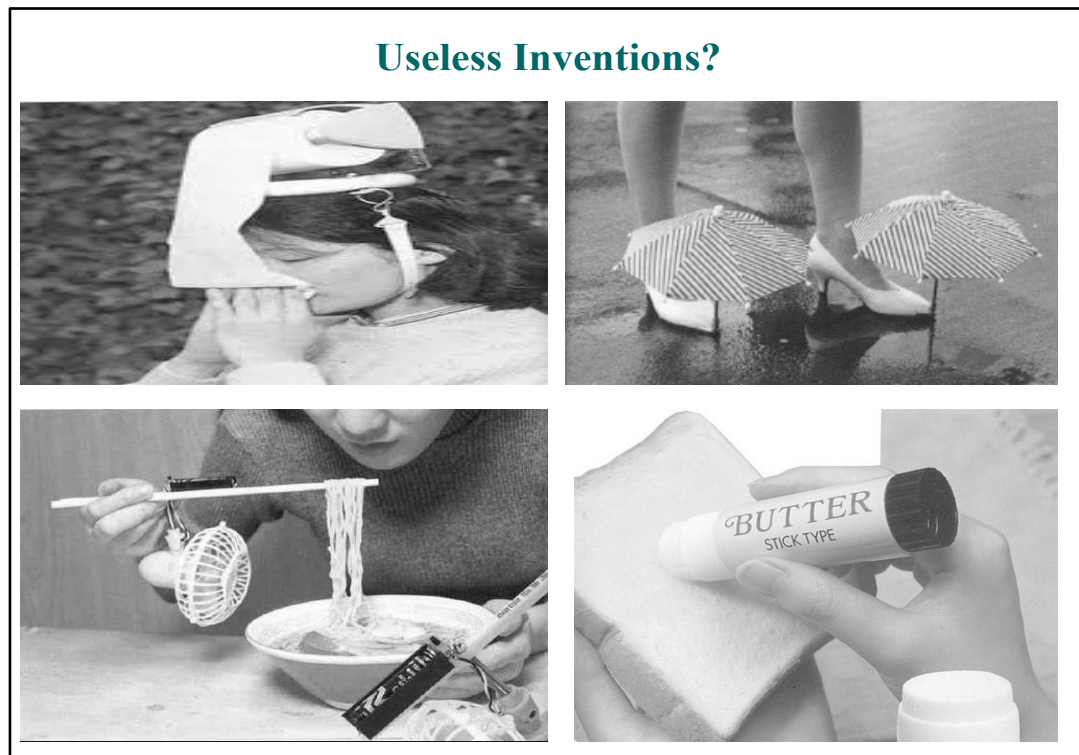


Figure 2.18
Inventions With No Guarantee of Revenue

This is not simply an exercise in definitions. Startup companies and SMEs work hard to form and build businesses, and they need all the help they can get. When they are starting their first company, it is important for them to understand that an invention, no matter how brilliant, will not be worth much if nobody wants to buy it. It is important for established businesses looking for new profit centers to understand that **brainstorming new product ideas is worth far less than identifying customer wants and needs and developing products or services to meet them.** For policymakers trying to figure out how to support a nation's SME agenda, understanding the difference between invention and innovation can lead to distinctly different approaches.

Verganti (2009) also differentiated between innovation driven by breakthrough technologies and improved product solutions enabled by better analysis of users' needs. The former involves radical innovation pushed by technology. It is closer to the invention process and appears more difficult, risky and expensive. The latter involves incremental innovation pulled by the market and appears less risky and more relevant for companies with smaller development budgets. Verganti (2009)

however proposed that some firms pursue a third strategy: design-driven innovation (Figure 2.19). He studied firms like Nintendo and Apple that use design-driven innovation and have generated products, services, and systems with significant and sustainable profit margins while increasing brand value.

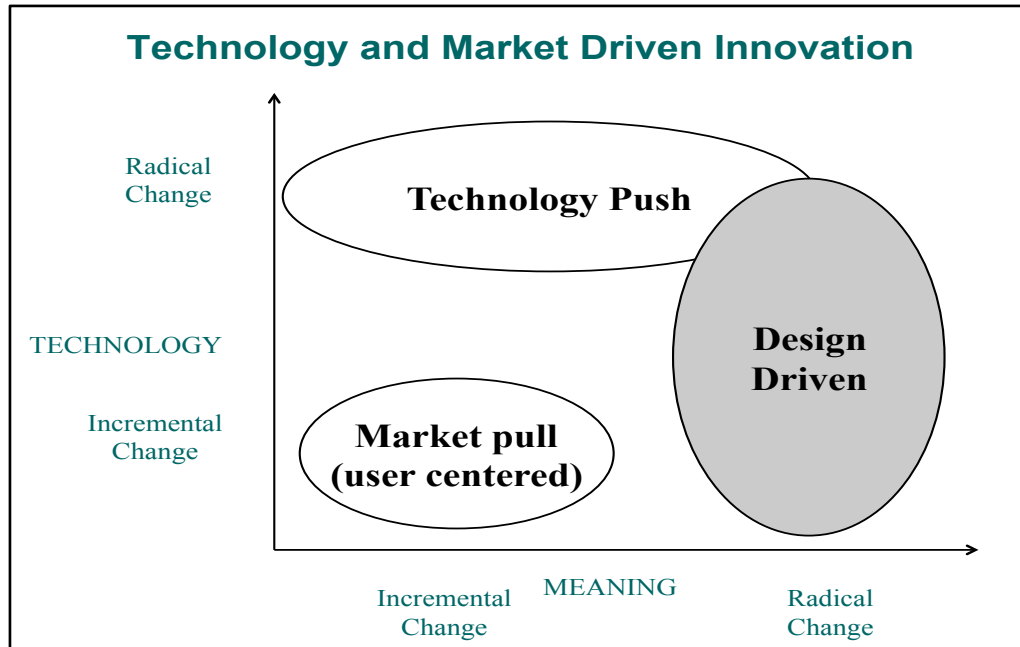


Figure 2.19
Design Driven Innovation (Verganti, 2009)

Inventors and innovators are different. The inventor creates a product with the dream of success. The innovator brings a product to market knowing with certainty that the market needs it. Understanding the difference and developing and implementing plans around each result in very different consequences for the individual entrepreneur, SME, corporations and even governments.

2.3.2 Innovation Can and Must Be Managed

It is obvious that innovation can and must be managed to realize sustainable benefits for the company. Skarzynski and Gibson (2008) discussed various innovation types like technology, product, cost, operational, management and business model while giving some popular examples. McKinsey (2008) reported on a study of 1,075 C-Level or other senior executives. 14% said that innovation is the top priority on their strategic agenda. The types of innovation companies pursued based on the survey cover product (71%), service (65%), process (62%) and business model (51%). As mentioned in Section 1.4.5, the scope of this research will only look into the business model innovation of the Firm's B2C mobile e-book business.

Davila, Epstein and Shelton (2005) proposed six levers of innovation where firms can leverage to differentiate and create competitive advantage; value proposition, supply chain, target customer, product and services, process technologies and enabling technologies. Skarzynski and Gibson (2008) added economics or profit model, geography and core competencies to the above list and mentioned customer types and customer benefits as important components when trying to innovate by targeting customers. Moore (2005) linked the innovation levers to the CVP model (Treacy & Wiersma, 1997)

Hamel (2007) presented a hierarchy of innovation in ascending order, based on the relative amount of competitive lead-time each particular form of innovation is likely to yield. He listed operational innovation, product/service innovation, strategic innovation (or business model innovation), and management innovation. He saw institutional innovation as even more significant still, because it extends to the wider business network or ecosystem.

Skarzynski and Gibson (2008) showed four independent and mutually reinforcing components of the company that can have an impact on improving innovation within a company; leadership and organization, people and skills, processes and tools, culture and values.

Leadership and vision appear to be the principal moderators of all other components of innovation capability (Verganti, 2009). Leaders must be able to visualize the future and to communicate a vision of the company's positioning which motivates the whole company. Leaders must ensure that resource allocation in all areas is appropriate to achieve the desired outcomes and they must be adaptive and recognize that needs may change throughout the various stages in the company's life cycle. Davila, Epstein and Shelton (2005) detailed out the leadership role in nurturing innovation within a company and even proposed a specific leadership designation of the Chief Innovation Officer. In addition to leadership, Prather (2009) suggested that companies look at two other arenas to ensure broader development of the innovation competency; education in creativity and innovation basics, knowledge and skill, and application of the processes to solve problems and get ideas to market.

A related effort in managing innovation is of course to measure innovation. Skarzynski and Gibson (2008) separated out measures that relate to the innovation input and throughput processes, innovation skills related to people and leadership, funding and the outcomes of the innovation effort. As mentioned in Section 1.4.5,

the scope of this study will focus only on the simple output measures of innovation like percentage of new revenue from innovation. McKinsey (2008) reported that the top outcome metrics was revenue growth from new products or services.

Detailed information is available in the literature about innovation types and classes, innovation capabilities and skills, innovation processes and tools and also innovation related performance metrics or measures. This strongly substantiates that innovation cannot be seen as that unpredictable moment of inspiration by a person that suddenly results in a winning product or service concept. Figure 2.20 and Figure 2.21 summarize the translation of just one aspect of innovation, product design, into process steps. When asked to describe product design, Tim Brennan of Apple's Creative Services group drew Figure 2.20. Liedtka and Ogilvie (2011) stated, "Design, this clever definition asserts, is simply magic" (p. 3). Figure 2.21 shows design as a process starting and ending in the same place as Apple's Tim Brennan, but having untangled the hairball into a manageable process. The same figure can be used to visually explain that innovation must be managed as a process so that it is repeatable and the related skills, tools and capabilities can be developed within a company to increase its innovativeness.

Davila, Epstein and Shelton (2005) related the famed management guru Peter Drucker's definition of innovation and linking it to organizational change. It strongly emphasizes that innovation by itself cannot be the objective, it must relate to an improvement in the business results and organization.

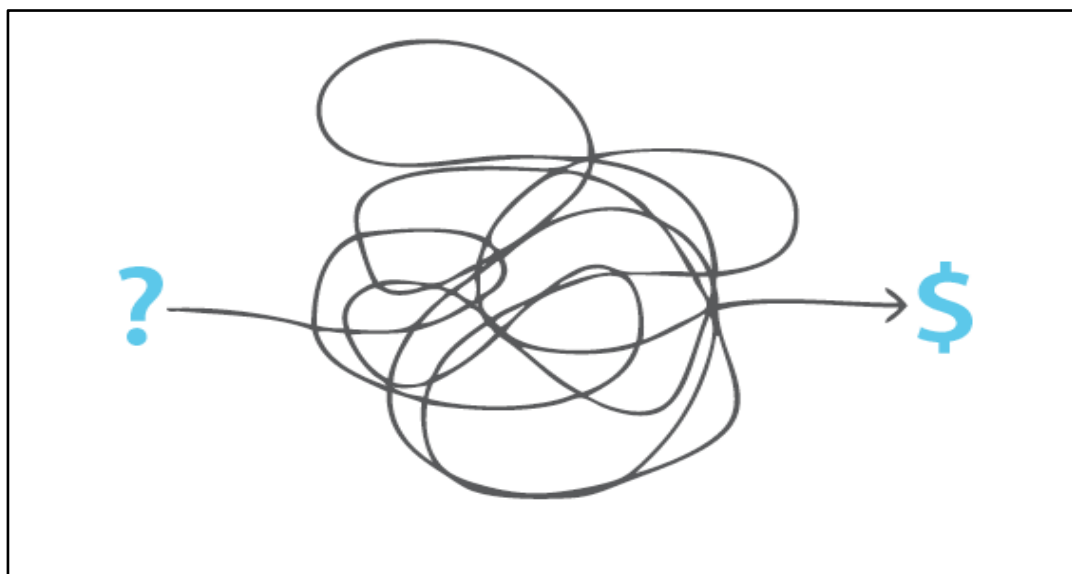


Figure 2.20
Design as Magic? (Liedtka & Ogilvie, p.3)

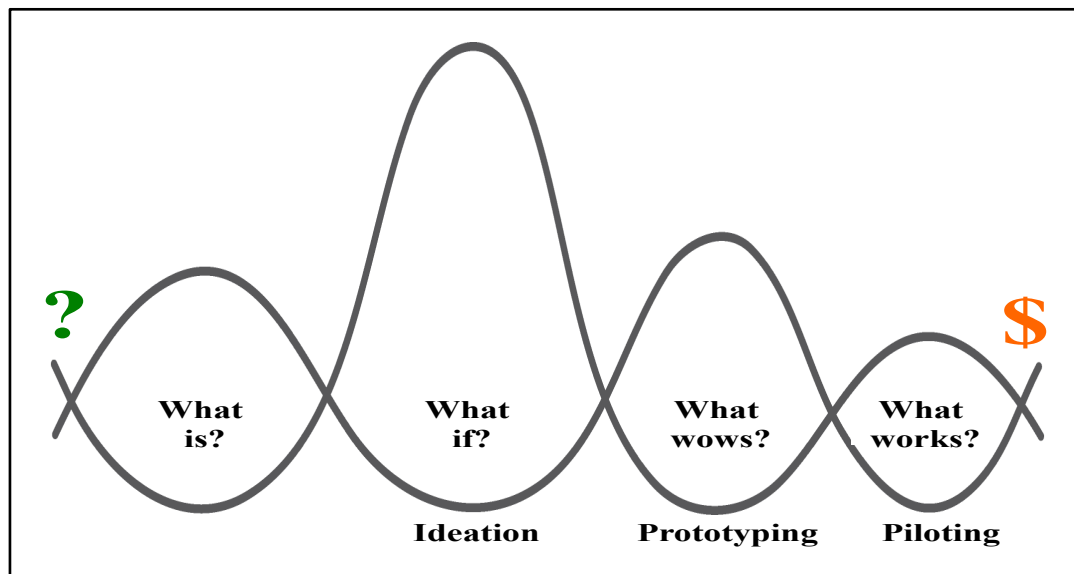


Figure 2.21

Design as a Manageable Process (Liedtka & Ogilvie, 2011, p. 21)

2.3.3 Definition of Design

A simple Google search on ‘What is Design’ gives more than 2.6 billion results. It is such a common word used both as a noun and verb. The overall topic of design is well discussed in Wikipedia covering its various definitions and terminologies, processes, disciplines and philosophies (Wikipedia Design, n.d.). The word design etymologically comes from the Italian word for ‘disegno’ which, since the renaissance, has meant "the drafting or drawing of a work." (Wharton Design, n.d.). This meaning is consistent with the general definition of design as the "Realization of a concept or idea into a configuration, drawing, model, mould, pattern, plan or specification (on which the actual or commercial production of an item is based) and which helps achieve the item's designated objective(s)" (Business Dictionary, n.d.). Thus the design of something, be it physical objects, user interfaces, processes or software, is a plan or drawing or specification produced to show its look and function or workings before it is built or made.

In this research the focus is on the process of design. In this respect design is simply defined as a method of problem solving (Brown, 2009; Martin, 2009; Liedtka & Ogilvie, 2011; Liedtka, King & Bennett, 2013) Through this simplest definition, although design can be shown in different forms or executed in many different ways, the function is always the same. Whether it is blueprints, a clever user interface, a brochure, or a physical object – design can help solve a visual or physical problem.

The 'design process' begins with the identification and analysis of a problem or need and proceeds through a structured sequence in which information is researched and ideas explored and evaluated until the optimum solution to the problem or need is devised. Brown (2011) basically puts that design equals creative problem-solving, a process especially suited to divergent thinking - the exploration of new choices and alternative solutions. Martin (2009) talks about business design as a human-centred approach to creative problem solving.

2.3.4 Design: Key Component of Innovation

Design is undoubtedly one of the key components that fascinate customers, analysts and the general public about tangible products like clothing, watches, shoes, cars, buildings and bridges. In fact there is a general perception of associating design with premium value and hence the promotion of designer clothing, designer watches, designer pens and so on. There is increasing attention being devoted to companies who have built or reinforced their competitive positions through design (Ravasi & Lojcono, 2004; Scanlon, 2007; Verganti, 2009). Apple's products like the iPod and iPhone have started setting the standards for product design and have also enhanced market share and profits (Scanlon, 2007). Recently, Microsoft has announced its intention to more strongly embrace design (Bass, 2012). A growing number of companies in industries as diverse as clothing, transportation, food and beverages, furnishings, consumer electronics, and so forth, are realizing the importance of design as a powerful competitive weapon. BusinessWeek (2010) published a special report "The Value of Design" which takes a closer look at how design can impact the bottom line of businesses in any industry.

If design can create a premium value in products and thus benefit the business performance, how can design practices be extended to the organization? Can the practices of designers somehow be applied to other aspects of the business? What ingrained habits are linked to a designer's ability to turn original ideas into innovations? What can people in business learn from studying the ways successful designers solve problems and innovate? Can managers and workers be more innovative by training them on the practices of designers? These are some of the early questions in simple terms that have led to the rise of a new idea in management called design thinking (DT).

2.3.5 DT Popularity

DT has recently been promoted as a management mantra for some time now. Its promise to increase the innovation capabilities of individuals and organizations by using the principles, practices and tools of the design trade, has been preached from all sides of the design and business spectrum. DT is seen as a remarkable phenomenon in its own right, described for example as a “powerful, effective, and broadly accessible” approach to innovation, “that can be integrated into all aspects of business and society, and that individuals and teams can use to generate breakthrough ideas that are implemented and therefore have an impact” (Brown, 2009, p. 3), or as “the next competitive advantage” (Martin, 2009). Nussbaum (2010) and Woudhuysen (2011) commented that the rise of DT fully allows use of the term ‘craze’.

Chronicling that rise, Woudhuysen (2011) described DT as one of the hottest recent topics in the business arena. It had ascended to top international universities. DT had been a theme at the 2006 World Economic Forum.

DT first won friends in education and business in 2005, when the Hasso-Plattner-Institute at Stanford University began teaching it (Plattner, 2011). It entered the mainstream of US management literature when Brown (2008), then the CEO of the design consultants IDEO, advocated it in the Harvard Business Review. In 2010, The Economist magazine held a major business conference on DT in London, and reported that DT had reached China, India, Mexico, and Brazil (McCullagh, 2011).

Management magazines have covered stories about the power of DT, and during the last years, several books were published on the concept (Brown, 2009; Lockwood, 2010c; Martin, 2009). Large businesses like Procter & Gamble, Hewlett-Packard and Apple have adopted its principles. Consulting outfits such as IDEO, Continuum, and Ziba Design have positioned themselves to take advantage of this growing trend (Brown, 2009; BusinessWeek, 2010; Martin, 2009). The Journal of Business Strategy published two special issues: Design and Business in 2007, and Practice of Innovation: Design in Process in 2009. These two special issues were considered relevant due to their specific combination of business and design. The management literature seemed to offer DT as a cure to nearly every challenge in business (Kimbell, 2009).

The researcher has linked DT with innovation and briefly touched on its growing popularity as a fairly recent management concept. It is now appropriate for a more detailed review of DT.

2.3.6 Design Thinking (DT) Defined

Design thinking is a popular but vague concept. There seems to be no agreed view on what is meant by DT. The notion of DT is broad (Cooper, Junginger & Lockwood, 2009). Precise definitions of DT vary and are rather elusive. Walters (2009) and Moggridge (2010) provided a flavour of differing views of DT. There are debates over what exactly is meant by it, and how it differs from creativity, innovation or systems thinking (Kimbell, 2009). Dorst (2011) argued that DT is a process to promote creativity and referred to many researchers who have explored this idea over the past decades. What seems obvious is the growth in the application of design into new areas, such as strategy, services or organization design, that go beyond the territory of traditional design that is linked tightly with physical objects (Cooper, Junginger & Lockwood, 2009; Kimbell, 2009). Dorst (2011) identified the possibility of using DT as an exciting new approach for dealing with problems in many professions, including IT, business and management.

Searching existing literature for a definition for DT showed that there are two differing streams in DT (Figure 2.22). Johansson and Woodilla (2009, 2010) clearly pointed out these two separate discourses and named them as the ‘design discourse’ and the ‘management discourse’. The former discusses the way designers think as they work, and is an academic discourse with a history of roughly 50 years. The latter discourse regards DT as a method for innovation and creating value. This management discourse appearing in early 2000, focuses on the need to improve managers’ DT skills for better business success.

However, even the more established promoters of DT within the management discourse have not presented a comprehensive definition for the concept of DT. Brown (2008), one of the most prominent authors within the management discourse, described it in quite abstract terms such as “a discipline that uses the designer’s sensibility and methods to match people’s needs with what is technologically feasible and what a viable business strategy can convert into customer value and market

opportunity” (p. 86). Lockwood (2010c) said that DT is generally referred to as “a methodology for problem solving and enablement” (p. xi).

Although defining DT is not conclusive Brown (2008) claimed that it is generally accepted that DT is a human centered approach to innovation that includes understanding people as inspiration, prototyping, building to think, using stories and having an inspired and inspiring culture.

Lockwood (2010c) contended that some of the key tenets of DT include: beginning by developing a deep understanding of the user/customer based on fieldwork research; having the users involved early on to get user evaluation of a concept; collaboration with the users and through forming multidisciplinary teams, creating radical rather than incremental solutions and seeking to add value. Above all, the importance of concurrent business analysis is integrated through the process, rather than added on later or used to limit creative ideations

Consistent with the need to somehow decipher design into a manageable and repeatable process, Brown (2009) stated that **DT is fundamentally an exploratory process** that develops solutions within constraints. Brown (2009) argued that design solutions need to meet three constraints: what is desirable (what makes sense to people and for people), what is viable (likely to become part of a sustainable business model) and what is feasible (what is functionally possible for the foreseeable future). DT and innovation are also described as stages of inspiration, ideation and implementation and design as a process.

Hassi and Laakso (2011) presented a three dimensional framework that has emerged from the current management discourse concerning DT. The emphasis is on identifying common terminology and characteristics used to describe the concept of DT. Through a detailed analysis of the selected literature discussing the concept and application of DT in different contexts, they summarized the results in three main groups of elements, or components. These were named as practices, cognitive approaches, and mindset. Each dimension contains a set of elements that were presented as key components of DT (Table 2.1). The approach presented here paves the way for a more commonly shared understanding on the concept of DT within the management discourse rather than attempting to produce a decisive definition. Peinado and Klose (2011) used this work and defined DT to stand for a method for innovating and creating value based on the way designers think as they work which

comprises a set of practices that designers engage in as well as cognitive approaches and a certain mindset.

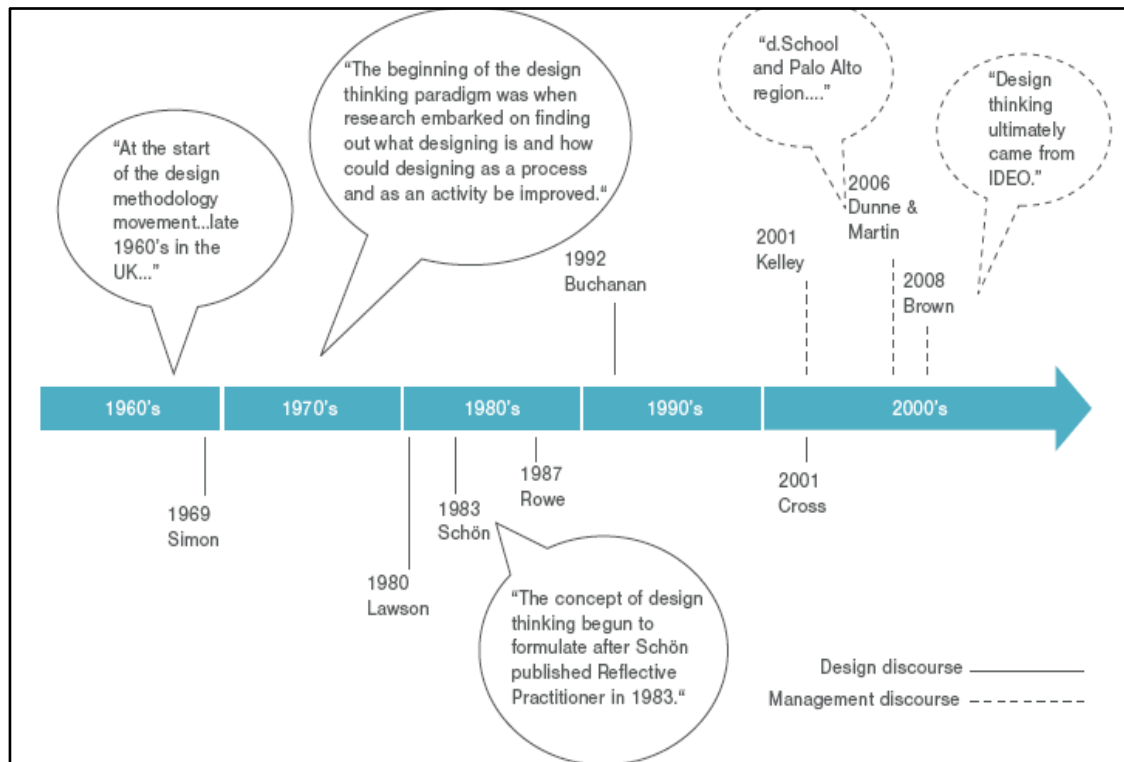


Figure 2.22
Two Discourses on Design (Hassi & Laakso, 2011)

The 'practices' category comprises of elements that are closely related to concrete activities, describing tangible approaches, ways of working, activities and the use of specific tools. The elements in this category include: human-centered approach, thinking by doing, visualizing, combination of divergent and convergent approaches, and collaborative work style.

From a cognitive perspective, DT is the core creative process that enables a designer to generate new ideas, summarizing from several authors (Buchanan, 1992; Cross, 2001, 2011; Dorst, 2011). The 'cognitive approaches' - dimension relate to issues such as mentality, cognitive processes and thinking styles. These elements are: abductive reasoning, reflective reframing, holistic view and integrative thinking. It is important here to note the summary conclusion from Cross (2011) that everyone is capable of and does design; that designing ability has not always been regarded as a specialization. This gives the researcher strong encouragement that managers and workers alike can be trained on DT practices.

Table 2.1

Framework on the Common Elements of DT (Hassi & Laakso, 2011)

Practices	Cognitive Approaches	Mindset
HUMAN-CENTERED APPROACH E.g. People-based, user centered, empathizing, ethnography, observation (Brown, 2008; Holloway, 2009; Ward <i>et al.</i> , 2009; Liedtka & Ogilvie, 2011)	ABDUCTIVE REASONING E.g. The logic of ‘what could be’, finding new opportunities, urge to create something new, challenge the norm (Fraser, 2009; Lockwood, 2009; Martin, 2009)	EXPERIMENTAL & EXPLORATIVE E.g. The license to explore possibilities, risking failure, failing fast (e.g. Brown, 2008; Fraser, 2007; Holloway, 2009)
THINKING BY DOING E.g. Early and fast prototyping, fast learning, rapid iterative development cycles (Boland & Collopy, 2004; Lockwood, 2010c; Rylander, 2009)	REFLECTIVE REFRAMING E.g. Rephrasing the problem, going beyond what is obvious to see what lies behind the problem, challenge the given problem (Boland & Collopy, 2004; Drews, 2009; Zaccai in Lockwood, 2010c)	AMBIGUITY TOLERANT E.g. Allowing for ambiguity, tolerance for ambiguity, comfortable with ambiguity, liquid and open process (e.g. Boland & Collopy, 2004; Cooper <i>et al.</i> , 2009)
VISUALIZING E.g. Visual approach, visualizing intangibles, visual thinking (Carr <i>et al.</i> , 2010; Drews, 2009; Ward <i>et al.</i> , 2009, Liedtka & Ogilvie, 2011)	HOLISTIC VIEW E.g. Systems thinking, 360 degree view on the issue (e.g. Dunne & Martin, 2006; Fraser, 2009; Sato, 2009)	OPTIMISTIC E.g. Viewing constraints as positive, optimism attitude, enjoying problem solving (Brown, 2008; Fraser, 2007; Gloppen, 2009)
COMBINATION OF DIVERGENT AND CONVERGENT APPROACHES E.g. Ideation, pattern finding, creating multiple alternatives, (Boland & Collopy, 2004; Drews, 2009; Sato <i>et al.</i> , 2010, Liedtka & Ogilvie, 2011)	INTEGRATIVE THINKING E.g. Harmonious balance, creative resolution of tension, finding balance between validity and reliability (Brown, 2008; Fraser, 2009; Martin, 2010)	FUTURE-ORIENTED E.g. Orientation towards the future, vision vs. status quo, intuition as a driving force (e.g. Drews, 2009; Junginger, 2007; Martin, 2009)
COLLABORATIVE WORK STYLE E.g. Multidisciplinary collaboration, involving many stakeholders, interdisciplinary teams (Dunne & Martin, 2006; Gloppen, 2009; Sato <i>et al.</i> , 2010; Liedtka & Ogilvie, 2011)		

The mindset-category refers to the mindset of both the individuals deeply engaged in the design work and the mindset portrayed by the organizational culture. Here ‘mindset’ describes the orientation towards the work at hand, and the mentality on which the problems are approached. The identified elements describe the DT mindset as being experimental and explorative, ambiguity tolerant, optimistic, and future-oriented.

This research will focus more on the ‘practices’ category since it is more applied in nature and can be directly used to come up with intervention programs to improve

the identified areas of performance in The Firm. Research on the practical implications of the remaining two dimensions can be done as a separate study.

One of the most prominently emphasized issues in DT is its inherent and thorough human-centered approach (Brown, 2008; Liedtka & Ogilvie, 2011; Porcini, 2009; Ward *et al.*, 2009). These authors were very consistent in emphasizing developing empathy towards and understanding of the customers/users (Brown, 2008; Clark & Smith, 2008; Dunne & Martin, 2006; Holloway, 2009; Junginger, 2007; Liedtka & Ogilvie, 2011; Lockwood, 2009). Beyond empathizing and understanding, collaborative design with the customers is suggested as a viable approach (Boland & Collopy, 2004; Brown, 2008; Liedtka & Ogilvie, 2011).

Thinking by doing refers to the iterative and highly tangible approach favoured by designers. The development cycles of the iterative approach are described as systematic (Liedtka & Ogilvie, 2011; Sato *et al.*, 2010) and rapid (Carr *et al.*, 2010; Holloway, 2009; Lockwood, 2010c). Early and continuous prototyping (Drews, 2009; Fraser, 2009; Holloway, 2009) is seen as necessary and beneficial throughout the entire process and must be done from the first day (Brown, 2008). Prototypes are seen to facilitate thinking and knowledge creation by means of idea formulation and demonstration (Lockwood, 2009), to help the exploration of numerous possible solutions (Fraser, 2009), and to make concepts concrete (Sato *et al.*, 2010). In essence, prototypes can be seen as a tool for stimulating thinking and exploring ideas, not as representations of the products (Boland & Collopy, 2004). The researcher will make repeated references to prototyping as a key component in developing his proposed framework for strategy management that is simpler and leads to faster action and implementation. The proposed concept of ‘strategy by prototyping’ that will be introduced is heavily borrowed from this key DT practice.

Closely related to prototyping, visualizing, i.e. expressing oneself in media other than words and symbols (Brown, 2009) is seen as the dominant sense-making mode of design thinking (Rylander, 2009). Visualization of intangible concepts, models and ideas is seen as essential (Carr *et al.*, 2010; Drews, 2009; Liedtka & Ogilvie, 2011; Lockwood, 2010a). It is a tool that easily promotes common understanding (Ward *et al.*, 2009), allowing ideas to be shared and discussed (Junginger, 2007) and most importantly, revealing relationships that are not accessible in verbal presentations or written reports (Sato *et al.*, 2010). The researcher notes that the strategy map tool of the BSC fits very well with the visualization practice of DT.

Thus the BSC strategy map will be used in developing the framework to address the main research question. Undoubtedly, the standard BSC strategy map model will have to be adapted for the proposed framework. Adapting the BSC has been discussed in Section 2.2.7.

Combination of divergent and convergent approaches refers to widening the scope and then moving towards a preferred solution by selection and synthesis as depicted in Fig. 2.21. The process of DT is described as having divergent beginnings (Brown, 2009). Multiple alternatives are created using various simple techniques like brainstorming with Post-It stickers (Drews, 2009, Liedtka & Ogilvie, 2011) without assuming that the existing alternatives, or the first ones that were thought of, include the best ones (Boland & Collopy, 2004). The wide range of ideas does not need to be limited to the very early stages, as openness to exploring multiple paths toward a solution is considered important (Drews, 2009).

Unlike the common notion of a creative genius working alone, a collaborative work style is emphasized as integral to DT by virtually all authors. The importance of involving a wide range of stakeholders is seen as a key approach (Drews, 2009). This most typically takes the form of using interdisciplinary teams (Brown, 2008, 2009; Clark & Smith, 2008; Holloway, 2009; Liedtka & Ogilvie, 2011; Lockwood, 2010c; Sato *et al.*, 2010). A collaborative work style is seen as important in gaining knowledge from many fields and disciplines and promoting diverse perspectives (Gloppen, 2009). This practice of course is not unique to DT but it helps to again demote the idea that creative work is best done alone during unpredictable moments of inspiration. It is also similar to strategy, which cannot be simply designated to only the CEO of the corporation or the SME owner and wait for his or her moment of inspiration. It is best done collaboratively.

The researcher offers a practical summary on the definition of DT based on the above review. DT is a framework that unites design and business and provides a set of practices, like visualization and prototyping, to improve the innovation capability.

2.3.7 Benefits of Design Thinking for Businesses

There is increasing attention being devoted to companies who have built or enhanced their competitive positions through design (Ravasi & Lojacono, 2004; Scanlon, 2007; Verganti, 2009). Extending the role of design through the way

designers think, work and manage has been proposed to be adopted by managers (Boland & Collopy, 2004; Borja de Mozota, 2003; Brown, 2008; Dunne & Martin, 2006; Liedtka & Ogilvie, 2011; Martin, 2009). In this section, the researcher will present findings from the literature on how businesses can benefit from using DT.

The role design has played within companies has been traditionally confined to manufacturing and production or as a styling element. The contributions of design are best known and valued in innovation including new product and new service development (Dell’Era, Marchesi & Verganti, 2010). Now, design is increasingly being viewed as a vital and important strategic business resource (Brown, 2009; Bucolo & Matthews, 2010; Dell’Era, Marchesi & Verganti, 2010) and consequently companies worldwide look to design to help them innovate, differentiate and compete in the global marketplace. Past research has traced the link between the integration of design into a company’s processes and strategies and a company’s performance (Perks, Cooper & Jones, 2005), providing evidence that using design is good for business. In practice, design is a key to greater productivity, whether by way of higher-value products and services, better processes, more effective marketing, simpler structures or better use of people’s skills (Fleetwood, 2005).

Design is no longer a niche market luxury. It is the most persuasive priority for solving problems, ensuring long term sustainability and gaining competitive advantages (Queensland, 2008).

More recently DT has moved from product and process design to becoming a key element in company strategy (Bucolo & Matthews 2010; Camillus 2008; Carlopio, 2009; Fleetwood 2005; Verganti, 2006, 2008). Interest in design and DT at a company level is largely stimulated by the growing recognition of the potential impact of design and its contribution to successful business practice and the popularity of the notion of DT at the business level. Recent research indicates that using design contributes to companies performing better economically (Borja de Mozota, 2003; Dell’Era, Marchesi & Verganti, 2010; Nussbaum, 2006; Moultrie & Livesey, 2009). DT and its application are not limited to large private sector companies. Both small companies (Ward, Runcie & Morris, 2009) and the public sector have been experimenting with DT. Public sector organizations are looking at new ways of increasing innovation and are experimenting with DT (Hall, 2011).

In a recent review on design and DT in business and management education and development, (Matthews & Wrigley, 2011) noted that four areas of categorization

emerged; Human Centered Design, Integrative Thinking, Design Management and Design as Strategy. The comments made on the fourth category is of particular interest to this research; “The fourth category of programs can be described as Design as Strategy or Strategy as Design. **This category is relatively ill-defined and largely under construction**, employing the principles and processes of human-centered design and components of strategy such as Porter’s value chain and activity maps (Porter, 1987), to present a whole of organization approach to design as a strategic as well as an operational process with the purpose of creating sustainable competitive advantage” (Matthews & Wrigley, 2011, p. 11).

Few academic papers have explicitly considered the design’s place in the value chain (Borja de Mozota, 2003):

- i. By optimizing the primary activities: design action on the consumer perceived value.
- ii. By optimizing the coordination among functions and the support activities of the company: design as a new function in the structure that transforms the management process.
- iii. By optimizing the external coordination of the company in its environment: design generating a new vision of the industry.

Using the notions of the ‘four powers of design’, Borja de Mozota described the application of design to organizations as design management. Applying categories similar to the BSC, Borja de Mozota focused on areas of process, customers, learning, and finance. Borja de Mozota (2003) admitted that quantifying the value of design in Porter’s terms is difficult when much is in the intangible values of goods and services. In this category of ‘Design as Strategy’ or ‘Strategy as Design’, design practices and methods are integrated with the products, services and communication strategies with which a company presents itself to market, giving form to its strategy (Bucolo & Matthews, 2010; Camillus, 2008; Carlopio, 2009).

Cooper, Junginger and Lockwood (2010) also reported work on DT applied to business strategy and business transformation, where the focus on DT centers on innovation and business transformation, which involves the discovery of unmet needs and opportunities, as well as creation of new visions and alternative scenarios. Martin (2010) and Leavy (2011) interestingly discussed the role of DT as a key capability for revolutionary innovators and a potential source of sustainable competitive advantage. Martin (2010) described DT as a process of continuously

redesigning a business using insight derived from customer intimacy and addresses product, process, and business model innovation.

Fraser (2007, 2009) asserted that the greatest payout of DT lies in the design of strategies and business models for organizational performance that creates both economic and human value. She visualized this through 3 iterative gears in business design as in Figure 2.23. It can be the path to understanding stakeholder needs, the tool for visualizing new solutions, and the process for translating cutting-edge ideas into effective strategies.

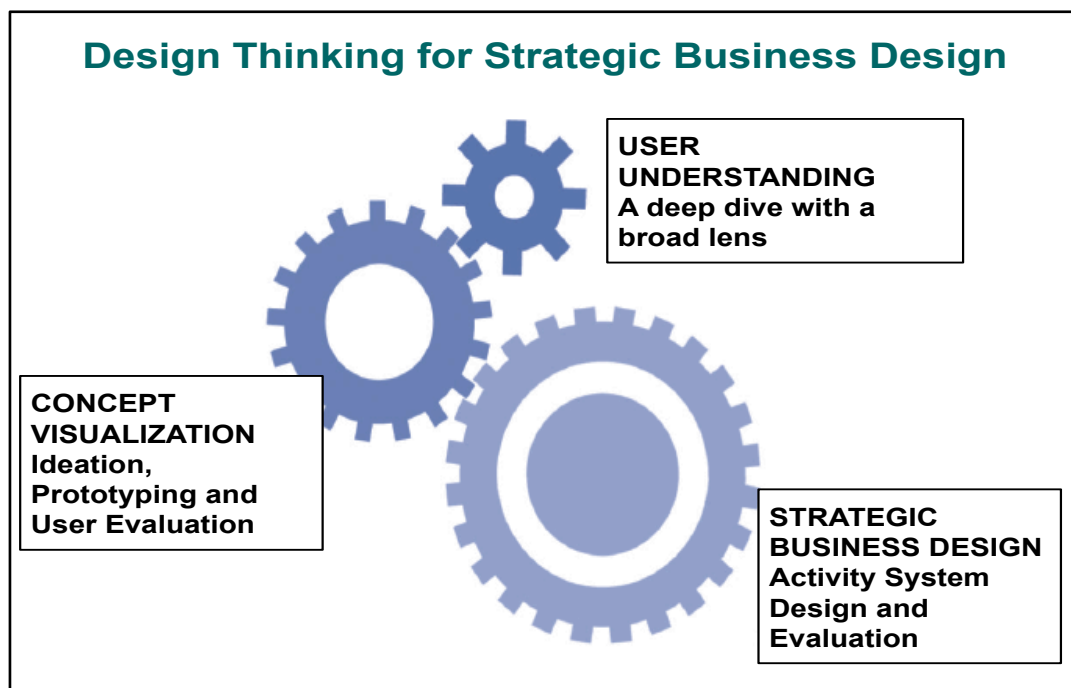


Figure 2.23

DT for Business Strategy Generates Greatest Value (Fraser, 2007)

Fraser (2007) wrote about ‘economics of design’ versus ‘**design of economics**’, claiming that herein lies the opportunity to leverage design practices for both cultural transformation and strategic growth. The economics of design are known and confirmed: good design of products and service experiences creates satisfaction, connections, desire and value to the ultimate user, taking a commodity product like watches, jeans and even slippers, to a premium position in terms of pricing. A smart redesign of processes can also yield economic rewards through greater operational efficiencies. Fraser (2007) further asserted that design has its highest value when applying DT to strategy and business modelling by designing the sustainable competitive advantage of a company. By embracing design practices and mindsets, a company can also fundamentally drive the design of economics in support of

dramatic new growth strategies. She commented that this is not yet a broadly embraced interpretation of design, but the evidence for success is mounting. This model may seem either radical or abstract in the beginning but those who discover its advantages find it surprisingly intuitive and practical. This is **precisely why this research is done since the documented knowledge on the use of design for strategy is still in its infancy. It is not yet broadly based, still relatively new and as such provides much room for study.**

Stevens, Moultrie and Crilly (2008) listed multiple ways that design can be strategic. Design expertise can contribute:

- i. in conceiving and creating high-value products;
- ii. in building product (or brand) differentiation and customer intimacy;
- iii. as an integrator and mediator between professional domains, both within the company (e.g. marketing, production) and outside (e.g. suppliers, distributors, partners);
- iv. as a hard-to-imitate tacit knowledge resource;
- v. in shaping, communicating and reinforcing the company's internal culture;
- vi. in exploring uncertainty and assessing trade-off, through prototyping and visualization;
- vii. in stimulating creativity and providing fresh perspectives in the strategy context.

It is obvious that the space where design and strategy meets is an open and interesting area of research. This confirms and validates that the research problems being addressed here are current and relevant to the strategy management body of knowledge. Matthews and Wrigley (2011) stated that many of the current programs related to design and strategy are at the post graduate MBA and executive education level and delivered as workshops through partnering arrangements with companies. This indicates that the body of knowledge related to strategy and DT is considered post-graduate material. With the added view that the greatest payout of DT lies in the design of strategies and business models (Fraser, 2007, 2009) this research involving DT, strategy and BSC will really make a significant contribution to current and important knowledge.

2.3.8 Integrating DT and Other Management Models

This research will study the application DT in the field of business strategy particularly combining DT with the BSC framework. In doing the literature review, the researcher subsequently looked at studies on the integration of DT with other strategy models and approaches. Although her earlier work was not directly related to DT, Borja de Mozota (2003, 2006) promoted design as an intangible asset called Design Capital. This is similar to other intangible assets like human capital, information capital and organizational capital (Kaplan & Norton, 2004) or intellectual capital (Cuganesan & Dumay, 2009; Edvinsson *et al.*, 2004). Design capital creates substantial value to the firm depending on the strategic route chosen. Design capital may come from design value for products, process, and organizational business model (Borja de Mozota, 2003, 2006a).

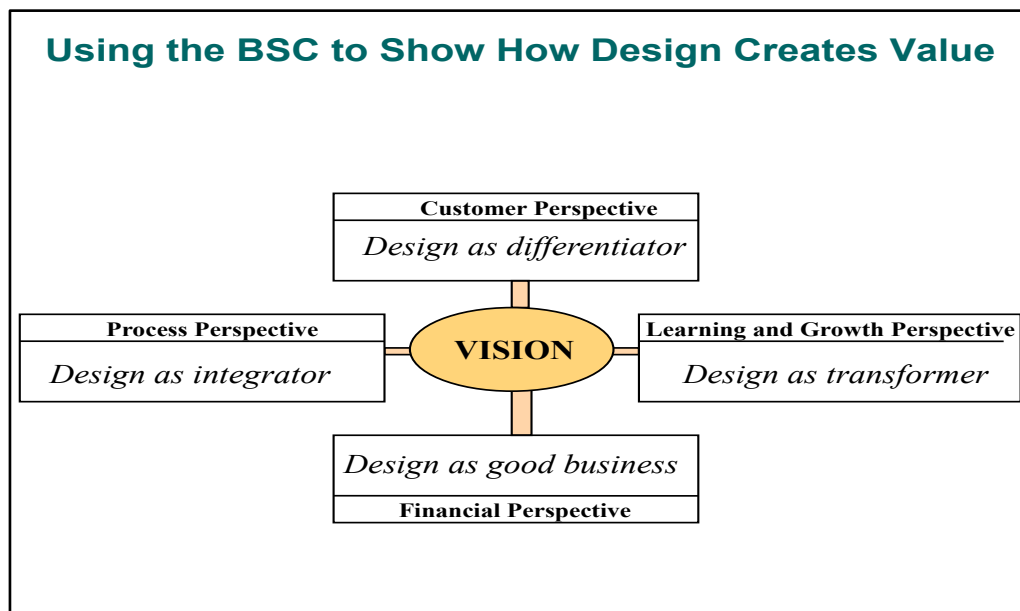


Figure 2.24

How Design Creates Value (Borja de Mozota, 2006a)

Interestingly and of relevance to this research, Borja de Mozota (2006a, 2006b) related her work on design management with the BSC. She proposed a value model for design management and described how it can be implemented using the BSC framework. Figure 2.24 shows the four powers of design in relation to the four perspectives of BSC.

- i. Design as differentiator (customer perspective): How should we appear through design to our customers in order to achieve our vision? Design

becomes a source of competitive advantage on the market through brand equity, customer loyalty, price premium or customer orientation.

- ii. Design as integrator (process perspective): How can design help in the business processes we excel in? Design becomes a resource that improves new product development processes (time to market, building consensus in teams using visualization skills); design as a process that favours a modular and platform architecture of product lines, user-oriented innovation models, and fuzzy-front-end project management.
- iii. Design as transformer (learning and growth perspective): How will we sustain, through design, our ability to change and improve? Design becomes a resource for creating new business opportunities; for improving the company's ability to cope with change; or (in the case of advanced design) as an expertise to better interpret the company and the marketplace.
- iv. Design as good business (financial perspective): To succeed financially, how should design appear to our shareholders? Design becomes a source of increased sales and better margins, more brand value, greater market share, better return on investment (ROI); design as a resource for society at large.

Design offers companies a competitive advantage that can take two forms:

- i. Design as differentiator. External, market based advantage derived from the design based differentiation of the company's product or service (design of products, design as perceived value, brand design value, corporate image).
- ii. Design as coordinator or integrator. Internal competitive advantage that comes from a unique, invisible, and difficult-to-imitate combination of organizational processes and resources.

In the first form, companies are really capitalizing on design in a reputational, or brand, context. The second form offers design as a core competency, that is, a resource-based view: design as process, design as knowledge and design as resource.

The reason for using the BSC model in design management was mainly to help designers and design managers make a bigger impression on business managers when they use a value-based model to measure the impact of design (Borja de

Mozota, 2006a). Although it is known that design brings value, designers and design managers still understand that one cannot manage what is not measured. So measuring the impact of design value is a key success factor for designers who want to successfully implement their design strategy and for design managers who want to present design as a tool for value management. Other reasons given (Borja de Mozota, 2006a) are that:

- i. the BSC is also vision-based, as well as holistic.
- ii. the four perspectives of the BSC model neatly coincide with the four powers of design as explained earlier.
- iii. the BSC model is widely known and often used by strategy consultants.
- iv. the BSC model is strategic and long-term-driven, which aligns itself well with DT, which is also based on long-term thinking.

“But more important, the BSC tool is a cause-and-effect model, in that each perspective has an impact on the other three. Just as a designer working on a project is used to thinking holistically, the BSC indicators are meant systemically - improving the quality of product design improves employee satisfaction and creates new knowledge that can generate better production process performance (and vice versa). In the same way, the BSC shows how each design discipline is linked with other design disciplines in a system based on a common, central vision” (Borja de Mozota, 2006a, p. 48).

By using the BSC model, Borja de Mozota (2006a, 2006b) showed the business value of design and how design allowed companies to develop a competitive differentiator using a language and tool that are familiar in business strategy management. The BSC model includes the ‘missing link’ of the financial value of design and emphasizes how design creates value for shareholders as well as for stakeholders. In this way, it “**facilitates the convergence of design and management**” (Borja de Mozota, 2006a, p. 53).

Borja de Mozota (2010a, 2010b, 2011) later on provided more detailed work in linking her proposed concept of design management, where she described the framework of how the application of design creates value for companies, to core competencies. She viewed that there is a clear shift in companies from merely designing the product portfolio or product strategy to “both a holistic design you can see - multidisciplinary process attitude (Michael Porter’s competitive advantage) and a design you can’t see - attitude, based on a different route of strategic formulation of

the ‘blue ocean’ or ‘resource-based’ view. In this view, design is a core competency for a company but also for country, city, and institution” (Borja de Mozota, 2011, p. 33).

She explained that design becomes strategic because skills and practices of designers are useful to develop new strategy routes. Each strategy route has to respond to the new challenges faced by the business. Managers are not looking for design as the solution. Design methods and practices become a competency, a tool in the knowledge system of the company that gives it a strategic advantage similar to a competitive differentiator as encouraged by Porter (1987).

Borja de Mozota and Kim (2009) mentioned that the European Commission considers design management to be a competence that comes under the umbrella of innovation management. This is in recognition of the fact that companies need innovation capabilities to be able to respond to new market opportunities and threats. Companies that invest in design tend to be more innovative and profitable, and grow faster than companies that do not. This paper also referred to studies showing that design-driven companies do better in the area of innovation than others. And that innovation-driven companies see sooner design as a strategy than non-innovative companies. These studies also show that companies that deploy design on a strategic level, or as an internal process, are quicker to come up with new products than companies that do not have a design policy in place. The design-driven companies understand design as a resource and a way in which to build sustainable competitive advantage. In such companies, the scope of design management is broader and more process driven than it would be if it were used on a project-by-project basis.

Managing design as a core competency is a high-risk venture and requires a long-term vision (Borja de Mozota & Kim, 2009). Therefore, many companies have been reluctant to invest in building design capabilities. A competence refers to an asset or input to production that an organization owns, controls, or has access to on a semi-permanent basis (Section 2.1.4). Managing design practices as a competence highlights how the possession of internal, valuable, rare, inimitable and non-substitutable resources may result in sustained superior performance. It emphasizes the importance of the invisible internal assets such as the skills and values, and consequently regards design practices as ‘design you can’t see’ or a competence that permeates throughout the company. Through this approach design emerges as a horizontal function in the company.

Koostra (2009) introduced the Design Management Staircase by combining the concept of design management with the popular maturity models like the Capability Maturity Model used in software engineering (www.sei.cmu.edu/cmmi) and Organizational Project Management Maturity Model used in project management (www.opm3online.pmi.org/). Figure 2.25 summarizes the Design Management Staircase.

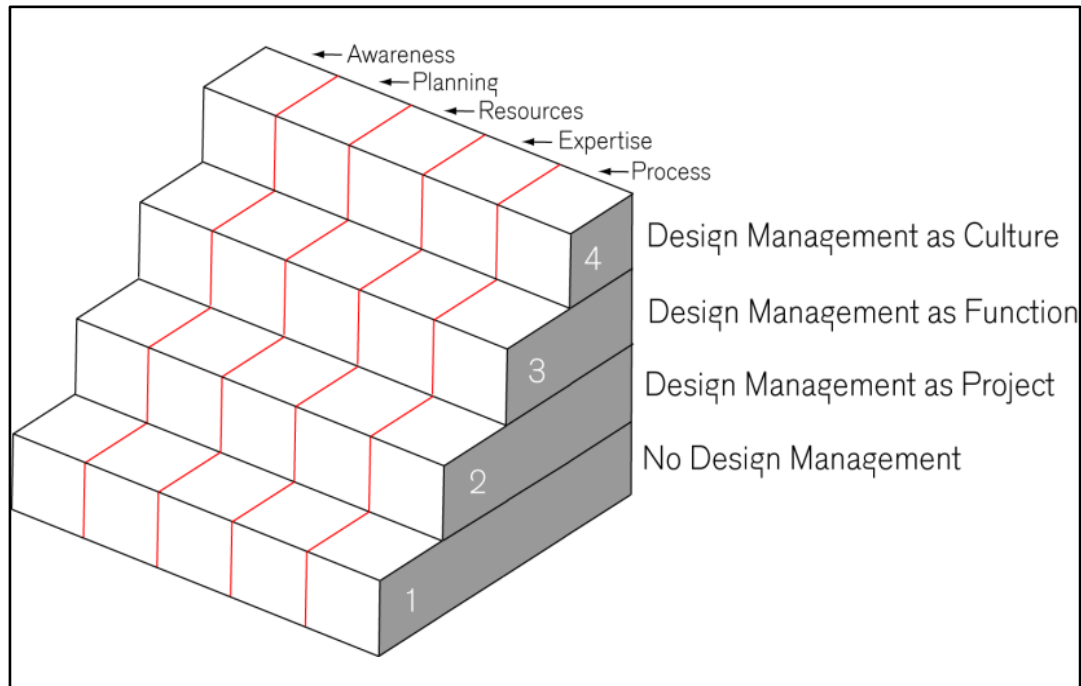


Figure 2.25
Design Management Staircase (Koostra, 2009)

Companies handle design in many different ways. One important challenge is, therefore, to bring the main aspects of design management capability together in a coherent model. Koostra (2009) put together the Design Management Staircase using an approach that is similar to the one the Danish Design Centre used in the development of its Design Ladder. Like the Design Ladder, the DM Staircase model is also a four-tier model, but a key difference lies in the fact, that the four tiers in the DM Staircase are defined on the basis of five factors, which makes the Design Management Staircase more specific and more detailed. Also it is focused on design management rather than simply the use of design (Koostra, 2009). The following gives brief explanations of each factor (Koostra, 2009):

- i. Factor 1: Awareness of benefits - The extent to which a company is aware of the benefits and potential value design and design management can offer.

- ii. Factor 2: Process - The extent to which a company pursues a robust and effective design management process, embedded into its core business processes.
- iii. Factor 3: Planning - The extent to which a company has developed a strategy for design, articulated in business plans, and communicated widely.
- iv. Factor 4: Expertise - The quality of the staff (level of experience, skills, and knowledge) and the range of tools and methods applied.
- v. Factor 5: Resources - The extent to which a company invests in design projects and deploys an appropriate design staff. Also if it invests in a creative working environment, hardware and software for design, etc.

Fleetwood (2005) applied the Danish Ladder of Design to indicate the extent to which firms engaged with design: from no design, to design as style, design as process, or design as innovation and used these criteria as the basis of a Design Audit. He also contended that thinking about design from a systems approach highlights that design capability cannot change without addressing the culture and values within the organization. The view about Design Audit relates to a common technical management function of auditing. Culture and values however are more fundamental and strategic components of a company (Collins & Porras, 1996).

As a final example of combining design with management ideas is the work by Borja de Mozota (2011) on the concept of the three-tiered design ladder for measuring design position and knowledge in companies.

- i. Design understood as style in the first level
- ii. Design as process at the second level
- iii. Design as strategy on the top level

These levels of design relates directly with the three levels in the innovation eco-system; innovation of product, process, and business model. At the strategic level, design skills and practices also become resources and core competencies for reinventing new business models.

Borja de Mozota (2011) also looked at the micro and macro economic impact of design. Now that design has become an activity that is more process oriented and less project-driven, it creates substantial and financial value for organizations, cities, regions and countries, and this value can be measured through customer capital, brand capital, human capital, organizational capital, and technological capital.

From the references above it is obvious that studying the relationship of the management related ideas from design, be it DT or design management, with other existing strategy related frameworks and methodologies opens up new contributions to the body of knowledge of Design as Strategy or Strategy as Design. The review here briefly covered work on design as a competitive differentiator, design as core competency and integrating design with the popular maturity models. One of the main scholars that studied these relationships is Borja de Mozota who comes from a design discipline in Université Paris. She has explored some of the known approaches in business strategy to put into business perspective her ideas about the strategic contribution of design to companies in a way that “facilitates the convergence of design and management.” (Borja de Mozota, 2006a, p. 53). She was the first to write about the integration between design management and BSC, but limited to using the original first generation BSC model (Kaplan & Norton, 1992, 1996). Although the work integrating design management and the BSC can be seen quoted in the work by other researchers, there has not been much follow up on the original proposed concept. For the purpose of this research though, integrating design management ideas and the BSC as proposed by a prominent design scholar provides academic credibility on the approach being taken in this study to look at the integration of the practices of DT and BSC to address the research question; to develop an easier framework for strategy management that addresses some of the identified problems of developing and implementing strategy for SMEs.

The recent dates of the publications quoted in this discussion show that the research topic of design and strategy is current. The literature on BSC has progressed greatly since 2003 whereby a third generation BSC has been discussed (Section 2.2.7). This gives added encouragement to study the integration of the latest ideas in DT practices and link it with more recent knowledge on BSC knowing that an earlier effort made a significant contribution to the knowledge area of business strategy and design. Among the later components of the BSC not used in the work by Borja de Mozota (2006a) that will be explored in this research are the use of adaptable Strategy Maps and Strategic Initiatives, through which the researcher proposes the concept of Strategic Prototypes.

2.3.9 DT Practices and Tools

This section will cover in detail the practices and tools related to DT. In Section 2.3.6 on defining DT, the researcher commented on his choice to focus more on the ‘practices’ category of DT since it is more applied in nature and can be directly used to come up with intervention programs to improve the identified areas of performance in the firm under study. Liedtka and Ogilvie (2011) mentioned three different ways of describing DT as a cognitive style, a general theory of design and as an organizational resource. They remarked that the **focus of DT as an organizational resource are businesses and other organizations in need of innovation**. This again supports the researcher’s choice and scope of studying DT as an organizational resource or capability for the purpose of increasing innovation in the firm under study. Some of the DT practices mentioned earlier in Table 2.1 are presented again.

Human-Centered Approach: DT is ‘human centered’ (Brown 2008; Holloway 2009; Liedtka & Ogilvie, 2011; Ward *et al.*, 2009) and starts with what real people in real situations need or might need (Leavy, 2012). The ‘might need’ is an important qualifier since it opens up the potential of identifying a currently unexpressed or unaddressed need and thus opening up opportunities. It emphasizes the importance of direct observational research as the essential first step.

Leavy (2012) specifically mentioned that the transition from design to DT is to empower the user as an active collaborator. He quoted the work on co-creation by Prahalad and Ramaswamy (2004), which described how companies could transform the competitive landscape by innovating in partnership with customers, and commented on the relevance of the techniques mentioned in that work for the human-centered approach of DT. Co-creation can apply to any business, large or small whose customers have experiences and interactions. Customer engagement can take many forms, from face-to-face meetings involving a handful of people to web-enabled, large-scale social interactions, involving many thousands.

Liedtka and Ogilvie (2011) further asserted that to be truly customer-centric, customer co-creation is not an option but a requirement anytime funds are allocated to a growth project. Potential customers must be engaged in the development of new business products and solutions. It involves putting some prototypes in front of potential customers, observing their reactions, and using the results iteratively toward

an improved offering. A typical co-creation phase might have several rounds, each incorporating the changes and improvements that emerged from the preceding round. It is clear that “if you want your innovations to be meaningful to your customers ... you need to invite them into your process” (Liedtka & Ogilvie, 2011, p. 159)

The researcher cautions that this approach must be carefully and strictly managed if it is to be used in fixed-cost and fixed-time projects like determining the number of iterations and building the timelines in the project plan. For such projects, the customer co-creation approach is useful in defining the functional specifications of the product (hardware) or system (software). There will lead to proper buy-in from the customer and easier to get them to sign-off the specifications, the related tests and close the projects.

Thinking by doing (Prototyping): Once the ideas or concepts have been roughly formulated, the DT practice quickly moves on to ‘learning by making’, mainly through the medium of rapid prototyping (Brown, 2009, p. 87-108). ‘Instead of thinking about what to build’, prototyping is about ‘building in order to think’, and the prototyping process itself ‘creates the opportunity to discover new and better ideas at minimal cost’. It is one thing to have ideas. But designers quickly take those ideas and give a physical form to them. Whether it's a napkin sketch, a prototype carved from foam rubber, Lego blocks or plasticine or a digital mock-up, the quick-and-rough models that designers constantly create are a critical component of innovation because it gives form and shape to an idea and the idea begins to become real. Prototyping is done early and fast in order to promote fast learning and understanding of the problem to be solved. It involves rapid iterative development cycles (Boland & Collopy, 2004; Liedtka & Ogilvie, 2011; Lockwood, 2010c; Rylander, 2009). Prototyping can also involve software and more expensive tools that may be established for specific industries. Figure 2.26 and Figure 2.27 show contrasting approaches in prototyping, from using simple colour paper and tapes to three dimensional Lego sets. Prototyping obviously incorporates the other DT practice of visualization.

In the mobile commerce world, the concept of prototyping can be extended to offering customers free trial versions of the products and services. These ‘beta’ versions of software, games, e-books and e-magazines etc. allow customers to provide feedback on the features and functions of the products and services. Improvements and extensions are made based upon the feedback obtained.

Sometimes the product or service may not be officially launched due to major complaints from customers or the lack of response. Thus prototyping can mean actually putting into the market and the customers' hands trial versions of the products.

It is true that when an idea is committed early by putting it out into the market while it is still imperfect, the possibility of short-term failure increases. Direct prototyping often involves an iterative process with setbacks along the way with those failures being actually useful because they show what works and what needs fixing. Today, many companies find themselves operating in a test-and-learn environment that requires rapid prototyping. This is another reason to pay attention to the practice of designers who have been conducting their work this way all along.



Figure 2.26
Simple Prototyping With Colour Paper and Tapes

Having said that, prototyping may not be suitable for fixed-time fixed-costs projects because it is difficult to estimate the budget, resources and time required to complete the iterative prototyping process.

Visualizing: Liedtka (2011) said that designers use imagery to envision possibilities and bring them to life. Visual thinking engages the imagination and it gives concepts more presence than written words do, akin to the common phrase ‘A

picture paints a thousand words’. With the wide availability of mobile phones with good resolution video and picture cameras, it is now easy to take pictures and make drawings on the wall, sketching out what a product or an idea might look like. The visual approach is particularly helpful in visualizing intangibles (Carr *et al.*, 2010; Drews 2009; Liedtka & Ogilvie, 2011; Ward *et al.*, 2009).



Figure 2.27
Visualizing and Prototyping Using 3D Lego Sets

Liedtka and Ogilvie (2011) also mentioned mind-mapping and journey-mapping as part of the designers’ visual tools. A mind map is a diagram used to visually outline information. A mind map is often created around a single word or text, placed in the center, to which associated ideas, words and concepts are added. Major categories radiate from a central node, and lesser categories are sub-branches of larger branches. Categories can represent words, ideas, tasks, or other items related to a central key word or idea. Mind-maps can be drawn by hand, either as rough notes during a meeting, or as higher quality pictures when more time is available. Mind-mapping is a visual method where one draws a diagram to record notes, ideas, thinking and the related analysis (Figure 2.28).

Journey-mapping is a representation, in a flowchart or other graphic format, of the customers’ experience as they interact with the firm in using its product or service. These maps can show the customers’ actual or ideal journey. Plotting the

stages of the customers' journey forces the firm to focus on customers, rather than internally. It helps identify the emotional highs and lows and the meaning the experience holds for the customer.

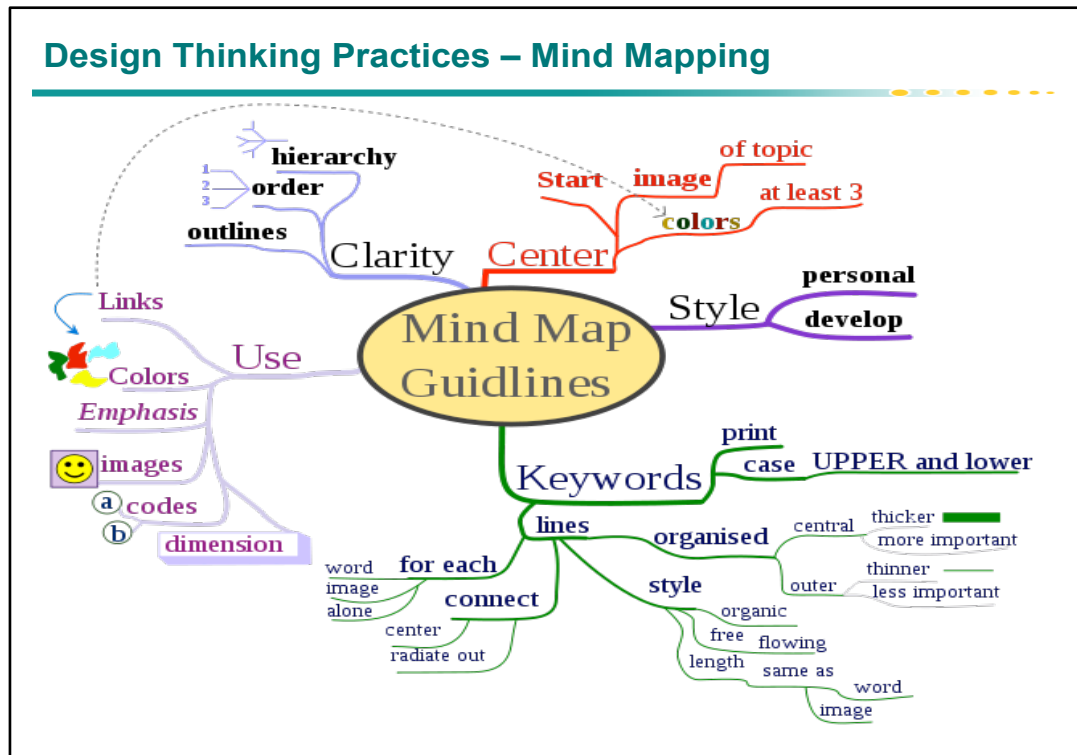


Figure 2.28

Sample Mind Map (http://en.wikipedia.org/wiki/Mind_map)

Visualization has received much support from many analytical disciplines. Cuganesan and Dumay (2009) reported on its use even in accounting practice, claiming it helps to visualize difficult concepts. They explored the ability of visualization techniques to inscribe the complexity of Intellectual Capital (IC). These were developed to make relationships between IC elements and value creation accessible to managers seeking to act on IC. It must be noted here that Kaplan and Norton (2004) proposed strategy maps as visual representations of a firm's hypotheses about how it creates value through the processes that it performs.

Combination of divergent and convergent approaches: This is how designers approach the process of ideation, pattern finding and creating multiple alternatives, (Boland & Collopy 2004; Brown, 2009; Drews 2009; Liedtka & Ogilvie, 2011; Sato *et al.*, 2010). Figure 2.21 is about the best description of design as a process. The design process deals with four basic questions, which correspond to the four stages of the process. The '**What is**' stage explores current reality. '**What if**' envisions a new future. '**What wows**' makes some choices. '**What works**' leads to the marketplace.

The widening and narrowing of the bands around each question represent what designers call ‘divergent’ and ‘convergent’ thinking (Brown, 2009, p. 66). In the early part of each stage of the DT process, the field of vision is progressively expanding, looking as broadly and expansively as possible around the problem so as not to be trapped by the usual problem framing and pre-existing set of solutions. After generating a new set of concepts, the process is reversed by converging, progressively narrowing down the options to the most promising.”

Collaborative Work Style: Although this may seem obvious, it contradicts the common myth that designers prefer to work alone often with their own idiosyncrasies and unpredictable moments of inspiration. The reality is that design work involves multidisciplinary collaboration involving many stakeholders and interdisciplinary teams (Dunne & Martin 2006; Gloppen 2009; Liedtka & Ogilvie, 2011; Sato *et al.*, 2010). For most companies collaborating in teams are common. Perhaps what may differentiate normal teamwork and the DT practice of collaboration is the involvement of the customers in developing and testing the products, services and even the strategies of the company.

In addition to the practices mentioned above, Berger (2010) mentioned the design practice of **Connect**. He explained that designers are good at synthesizing; taking currently known and available product/service ideas or components and mashing them together in fresh new ways. This can be a valuable shortcut to innovation because it means the firm does not necessarily have to invent from scratch, something valuable for SMEs in particular. He mentioned that through ‘smart recombinations’, Apple has produced some of its most successful hybrid products; and Nike smartly combined a running shoe with an iPod to produce its groundbreaking Nike Plus line (which enables users to program their runs). Designers try to think laterally, searching far and wide for ideas and trends, and then try connecting ideas that might not seem related. This is a simple enough practice that can also be adopted by managers. The researcher is pleased to note that his approach to **connect and synthesize DT and BSC is an example of a design practice applied to the area of business strategy.**

From the literature surveyed, the toolkit by Liedtka and Ogilvie (2011) seems to be the most complete discussion on the design process, practices and tools applied to product/service creation. They detailed out ten essential tools that a design thinker uses to create new possibilities and reduce the risk in managing the inevitable

uncertainty of growth and innovation. These are “some of the actual tools and practices used by managers who are, in effect, successful design thinkers. **These tools, we argue, can be used by all managers to find and pursue innovation and growth**” (Liedtka, 2011, p. 13).

- i. Visualization: using imagery to envision possibilities and bring them to life
- ii. Journey Mapping: assessing the existing experience through the customer’s eyes
- iii. Value Chain Analysis: assessing the current value chain that supports the customer’s journey
- iv. Mind Mapping: generating insights from exploration activities and using those to create design criteria
- v. Brainstorming: generating new possibilities and new alternative business models
- vi. Concept Development: assembling innovative elements into a coherent alternative solution that can be explored and evaluated
- vii. Assumption Testing: isolating and testing the key assumptions that will drive the success or failure of a concept
- viii. Rapid Prototyping: expressing a new concept in a tangible form for exploration, testing, and refinement
- ix. Customer Co-Creation: enrolling customers to participate in creating the solution that best meets their needs
- x. Learning Launch: creating an affordable experiment that lets customers experience the new solution over an extended period of time, to test key assumptions with market data

Visualization is highlighted as a ‘meta’ tool, so fundamental to the way designers work that it shows up in virtually every stage in the process of designing for growth. Often, visualization is integral to the other tools. It is an approach for identifying, organizing, and communicating in ways that access the creative thinking while decreasing the use of the analytical media such as numbers and sentences.

The approach taken and many of the case examples cited by the authors in their work focus on design practices and tools for creating new products and services. Some adaptations will be proposed by the researcher in using some of the design practices and tools for the strategy related problem to be addressed in this study.

2.3.10 Differentiating Design from DT

The researcher would like to summarize an interesting discussion by Liedtka and Ogilvie (2011) in trying to define DT and differentiate it from design. This subtle point is better appreciated after knowing some of the tools and practices of designers and looking at its applications in a business context.

The refined abilities of gifted designers are well beyond the grasp of most managers. But when it comes to business growth and innovation, the talent of interest “is not rooted in either natural gifts or studio training; it lies with having a systematic approach to problem solving. That, to us, defines DT, and **it can be taught to managers**” (Liedtka & Ogilvie, 2011, p. 5).

The authors compared the way traditional MBA students and design students tackle a challenge faced by a leading consumer products firm: how to think about and respond to changes in the retail marketplace over the next ten years.

The MBAs would likely begin by researching trends in the marketplace using the normal PEST (political, environmental, social, technological) categories. They will study analysts’ reports, interview industry experts, and benchmark leading retailers and competitors. They will produce forecasts and recommend a set of strategies, complete with spreadsheets on ROI (return on investment) and NPV (net present value) calculations. They will probably summarize it all in a PowerPoint presentation.

The design students might begin with a similar trend analysis, but they would use it to develop scenarios of possible futures instead of spreadsheets. They would hang out in stores and talk to shoppers and employees, focusing on the shopping experience. They would likely create some different customer personas and use the scenarios to try to model the changes in the personas’ lives—and, accordingly, in their shopping habits—over the next ten years. They might sponsor a ‘store of the future’ brainstorming session. They would use the scenarios and personas as a starting point and build on them as a group. Ultimately, they would present not solutions but a small number of concepts to be prototyped, with the aim of soliciting feedback from real customers and collaborators.

These obvious differences in framing, data gathering, and output indicate more fundamental differences in the core assumptions and decision drivers underlying each approach. Business thinking assumes rationality and objectivity. Its decision

driver is cold, clean, economic logic. Reality is precise and quantifiable. Design assumes instead human experience as its decision driver and sees true objectivity as an illusion. Reality, for designers, is always constructed by the people living it. Decisions in this world are seen as driven by emotion more than logic; desire is seen as a more powerful motivator than reason. In this world, answers are better or worse rather than right or wrong. Hence the MBAs analysed trend data; the designers observed the shopper's experience. The researcher notes that DT appears easier and less costly for SMEs.

These differences in core values and assumptions translate into very different tools and practices. Business thinking favours analytical approaches; decision-making processes demand proof of the correct answer; make their case with complicated spreadsheet ROI simulations and impressive PowerPoint presentations. "Design, in contrast, favours **trying over extensive planning and is overwhelmingly experimental in its approach**. Designers expect to **iterate their way to increasingly 'better' answers; so the designers create prototypes** with paper, foam core, or video" (Liedtka & Ogilvie, 2011, p. 11).

In business we almost always dwell lofty and abstract statements like vision statements and thick strategy documents or very specific real work like producing a purchase order and project reports. Design, as a practice, iterates not only in time but also across levels. It moves continuously back and forth between levels of abstraction, between the big picture and the concrete models and prototypes, which lead to the final product. Designers seek comfort by quickly moving from an idea or abstract concept into tangible models and prototypes that make ideas feel real, rather than spreadsheets and mission statements that dwell in abstractions. As mentioned earlier, this DT practice of iterative prototyping **may not be suitable for fixed time and fixed costs project since the scope, time and costs may keep moving**.

Table 2.2 summarizes the different approaches of business and design. For the purpose of this research, among the most attractive thing about the DT practice is that it **"is all about action, and business too often gets stuck at the talking and planning stage"**. This could solve one of the key problems related to the time taken to develop strategy (Section 2.1.6). Despite all the planning, analysing and controlling, for many strategic planning efforts, the implementation results are not impressive. Some academics estimate that only between 10 percent and 60 percent of the promised returns of new strategies are actually delivered (Kaplan & Norton,

2000; Mankins & Steele, 2005). Even mission statements may not be useful. A global study involving more than 300 firms found that a high 82 percent had mission statements, but less than half the managers interviewed thought that those statements had anything to do with the reality of their day-to-day business (Wright, 2002). The most encouraging practice of design is that it has real tools to help us move from talk to action and work closely with the customer and other stakeholders.

Table 2.2

Comparing Business and Design Thinking (Liedtka & Ogilvie, 2011)

	BUSINESS	DESIGN
Underlying Assumptions	Rationality, objectivity; Reality as fixed and quantifiable	Subjective experience; Reality as socially constructed
Method	Analysis aimed at proving one 'best' answer	Experimentation aimed at iterating toward a 'better' answer
Process	Planning	Doing
Decision Drivers	Logic; Numeric models	Emotional insight; Experiential models
Values	Pursuit of control and stability; Discomfort with uncertainty	Pursuit of novelty; Dislike of status quo
Levels of Focus	Abstract or particular	Iterative movement between abstract and particular

The other factor about DT relevant for this research is that it is tailored to dealing with uncertainty. Strategy is about changing the company to try new approaches, business models, practices and markets that the company has not ventured into. It is a path into the future that involves uncertainty, some puzzles and perhaps some mysteries. No amount of data about yesterday will solve the mystery of tomorrow. The belief that 'analysis equals reduced risk' may not be applicable in the face of uncertainty. Using numbers from the past to predict the future has its risks. The experimental DT approach and knowing how to improve from failure rather than detailed planning and analysis before action, allows strategy to be 'prototyped' quickly and tested. Good designers make their ideas concrete and go out and get better data from the real world rather than extrapolating data from the past. The strategic prototypes are then improved iteratively toward success or upon reaching some cut-off or stop criteria for 'failure', like not achieving specific outcome targets within a stipulated time frame or budget. Liedtka and Ogilvie (2011) briefly mentioned that the design brief should include 'success metrics' (p. 205).

2.3.11 DT Criticisms

One of the earlier proponents of DT now considers DT a failed experiment (Nussbaum, 2006, 2009, 2010, 2011). Merholz (2009) even questioned the need to bother about design thinking. Within the same year, Norman (2010a, 2010b) changed from appreciating DT to attacking DT as merely a public relations term for creative thinking that is not restricted to designers. Walters (2011) also downplayed the popular hype of DT pointing out some problem areas in DT and offered suggestions where it can benefit organizations.

There exists the usual criticism among academicians on some of the concepts around DT. Woudhuysen (2011) pointed out that Verganti (2009), who also relates the differentiating role of design in innovation, criticized DT for neglecting not just technological innovation, but also the meaning that design confers on products. Meanings are indeed important to design (Verganti, 2010).

Also in DT ‘sustainability’ tends to be taken for granted with no link drawn between the user, the environment and the retail price of goods. Consumers tend to put price considerations above environmental ones and an inflationary world has made them more price-conscious, thus Verganti (2010) viewed this omission on environmental considerations in the discussions on DT as serious. He pointed out the major differences between sustainability and user-centered innovation.

In the researcher’s analysis the most glaring element that is missing in DT is the element of cost. Woudhuysen (2011) mentioned that the popular books on DT (Brown, 2009; Martin, 2009) are almost silent on the issue of cost. Although Martin (2009) and Liedtka and Ogilvie (2011) do consider costs, they did not give costs any dedicated treatment. It seems that in the DT literature, “costs and economics never get a chapter of their own” (Woudhuysen, 2011, p. 15). The researcher notes that the cost element must be particularly considered when DT is to be introduced to SMEs.

These criticisms do not imply that DT is dead or there is no continued interest in DT as a knowledge discipline. Like many management ideas and concepts, some, especially in government, have adopted DT rather uncritically (McCullagh, 2010).

This research focuses more on the application of selected DT practices like visualization, customer engagement and prototyping for which the literature surveyed has not criticized, although some of the noted shortcomings must be considered.

Thus, the idea to synthesize DT with BSC to create a simpler and more action-oriented model for strategy implementation for SMEs is still useful and practical.

2.3.12 Examples of the Use of DT in SMEs

Since this research focuses more on the SMEs, a specific discussion on the literature review of DT being used within the SME segment is obviously important.

Brazier (2004) confirmed that design is the opportunity for SMEs. Every SME has some aspect of the business that design can make a difference; in their products or services; in the way they promote themselves; in their business offices, production facilities or retail outlets, and also their websites and Facebook accounts. These present opportunities for SMEs to interact with their customers, staff and suppliers. These interactions can be significantly improved by better design to improve branding or increase sales or even reduce costs. The use of design in some of these opportunities for SMEs to gain competitive advantage is largely neglected. If SMEs are to use design for competitive advantage, they need the ability to manage design. Most will not have this capability in-house and will need support. If they are to use design to its full advantage, they must use it strategically. One option is for the SMEs to use professional designers through hiring or outsourcing, which obviously involves costs. The SMEs could also develop capabilities in design practices, which although involves training costs, makes the design practices more permanent, sustainable and pervasive over time.

There is limited work reported in the literature on DT and SMEs (Borja de Mozota, 2006a; Borja de Mozota & Kim 2009; Matthews & Bucolo, 2012; Ward, Runcie & Morris, 2009). Perhaps this is due to the only recent promotion of DT in relation to strategy. The use of DT in SMEs is certainly relevant since design obviously can significantly help SMEs. The lack of research papers that cover DT and SMEs argues favourably for the relevance of this research.

In a specific study on DT and small enterprises in such diverse sectors as nanotechnology, fuel cells and garden ceramics, (Ward, Runcie & Morris, 2009) mentioned five key areas where design can help to add value to businesses – **vision and strategy**, brand and identity, product and service, user experience and **innovative culture**. These five areas have provided a framework for introducing and embedding design capability in the reported companies and map out opportunities for

design-led improvements and innovations. The researcher is most interested in the first and the last of the five areas mentioned above and as such will detail out the explanation by the authors.

- i. Vision and strategy – It is about designing the business, not just the product. The idea that design and DT can help to shape a company's vision and strategy can be a new one for the owner-managers of small businesses who may struggle even to find or describe their vision for their company. Helping all employees subscribe to a collective vision is another challenge, as is ensuring that all of the company's plans for growth are strategic and focused on achieving its aims. The starting point is for the SMES to state where they are, where they are going, and how they are going to get there – with the idea that even the smallest company or youngest start-up should have a clear vision of their reason for being, their offer, their market and their competitors – and a clear idea of what they want to become on a three or five year horizon. So far there may seem little that is design-led or even design-conscious about these common and popular principles. Designers practice systems thinking that combines holistic vision and specific attention to detail. For example, a graphic designer ensures that an identity, like colours or logos, not only meets business objectives but can also be applied across packaging, printed communications, web sites, and business cards. Thus DT integrates mission or values or vision statements with other details of the company's strategy and operations. If DT can help companies put the strategy into their vision, it can also help them put the vision, or more explicitly, the visual, into their strategy. All designers use visualization to aid understanding – expressing not just colour and form, but also complex ideas and relationships using sketches, drawings and maps. These tools are very useful in helping companies to articulate and communicate their business ambitions through action plans and roadmaps. The authors reported that managers of SMEs welcome the opportunity to understand and visualize their day-to-day challenges using different graphical techniques. The researcher notes here that perhaps one obvious link between strategy and DT involves visualization, relationships and integrated, holistic thinking. These DT practices are embedded in the

BSC Strategy Maps, which are visual, emphasize the cause-and-effect relationships and linking everything with the vision and strategy across multiple perspectives of the company. Thus the BSC Strategy Map is an excellent starting framework for integrating strategy with DT.

- ii. Innovative culture – It involves making design practices common within the company. The idea is to bring DT into the company's premises and to its entire workforce. It is like motivating to make design practice everyone's concern and passion. This is done by engaging managers and teams with games and workshops and assigns team tasks and homework, encouraging often isolated departments to work together. Example companies have plastered their walls with product and project roadmaps and concept prototypes, thus enabling all employees to see where the company is going and how their own contribution fits into that aim. This also helps to embed a more innovative culture and environment.

Matthews and Bucolo (2012) studied only two SMEs in Australia to find out how firms that participate in a design intervention program use DT and design methodologies to contribute to innovation activities and improved business performance. The researcher sees this research having some similarities in the research problem it seeks to address although they used a case study analysis. They selected mature companies with existing documentation of well-recognized innovations after completing the design intervention program for quite a few years to examine indications of any long-term impact. Although the report is not an action research study, it provided a retrospective analysis of these two companies from different sectors resulting in the following observations.

- i. Each firm wanted a culture of innovation for current and future business success and saw the design innovation program as a way to facilitate that organizational transition. The researcher notes that this shows that design practices can help build a stronger culture of innovation in SMEs.
- ii. The design innovation program is a holistic program that applies DT, looking for possible alternatives, and user-centered methods to all aspects of the business. The design process begins with identifying the business strategy, the firm's identity and vision and assists in reframing the value proposition of the company. As discussed in Section 2.1.1, identity, vision and value propositions are basic elements in defining a company's

strategy. Here again DT is used to help two SMEs on strategy, confirming that the researchers proposed action research using DT and BSC to help craft an SMEs strategy has some precedence.

- iii. In terms of Fleetwood (2005) four levels of innovation, both firms use design as a process. Both firms described moving from design as a process level to design as strategy, with a focus on innovation at multiple levels of the company. From this observation, the researcher notes that using design as strategy may not be easy for an SME that is not currently using design as a process. The authors commented that their research is particularly relevant for firms having some experience with design as an existing capability within the firm particularly in product development.
- iv. Organizational Change - Iterative process of crafting and revisiting strategy and monitoring its performance. The researcher notes with interest that applying DT to the SMEs helps in developing new ways of thinking and working.
- v. The research will have important outcomes for SMEs that are considering seeking strategic renewal by participating in programs designed to encourage entrepreneurship and innovation.
- vi. The findings will also have implications for the designers of intervention programs, intermediaries involved in the application of these programs and policy developers.
- vii. The research contributes to theory and practice by beginning to draw a holistic picture of design and innovation in SMEs that emphasizes elements of the design processes for defining problems and generating solutions, the importance of a user-centered process, developing strategy that is sensitive to the external as well as the internal environment and shaping the organizational culture and structure to the potential influence of these elements on strategy and innovation.

The final three observations gave added encouragement to the researcher that the research question being investigated in this thesis can also have important outcomes for SMEs and policy makers and contribute to the theory and practice of strategy management for SMEs.

The program reported by Ward, Runcie and Morris (2009) engaged experienced design mentors who worked with the small companies. They were handpicked,

experienced professionals who brought more than just experience in managing design. They brought their own techniques, methodologies and flexible creative thinking approaches to each company. This may cost the SMEs, a factor that the researcher notes with some concern.

These reports (Matthews & Bucolo, 2012; Ward, Runcie & Morris, 2009) support the current relevance of this research which also involves an SME as a case study for a DT intervention program related to strategy. It is encouraging that a relatively new management concept like DT is being applied in relation to strategy and building innovation capability for SMEs. Most of the work as reported here is rather new, indicating that such research is beginning to gather interest. Obviously none of the case studies involve Malaysian companies or SMEs. Thus the research in this thesis in synthesizing DT and BSC while applying the ideas for a target SME in Malaysia should result in important outcomes for SMEs and policy makers and contribute to the theory and practice of strategy management for SMEs.

2.4 Brief on SMEs and the Malaysian SME Landscape

Globally it has been widely acknowledged that SMEs are key national actors that foster socio-economic development in an increasingly globally interconnected environment (UNCTAD, 2000). The United Nations report confirmed that SMEs play a major role at all levels of economic development in different countries. They generate much employment and are widely considered to be vital for competitiveness and economic growth (OECD, 2004; UNCTAD, 2000). Typically, SMEs contribute around 50 percent of GDP, and 60 percent of employment in national or local economies and contribute about 30 percent of exports (OECD, 2004).

In the APEC region, SMEs account for 90% of all businesses and as much as 60% of the workforce. SMEs have been recognized as a source for innovation and contributor to forward-thinking ideas that can enhance the economic growth of the region (SME Plan, 2012). As such, SMEs are integral to the region's development.

Thus it is important to know how an SME is defined and what are some of its salient characteristics. Clargo and Tunstall (2011) reviewed and substantiated many economic contributions of SMEs. Citing other references, they said that although it has been found that many new firms fail, the successful small and new businesses provide more economic growth, create more jobs, enable effective wealth

distribution and practice more innovation than large firms. The economic contribution of SMEs is recognized as being of value to a nation's economy and as such, programs to promote and enhance SME competitive performance accordingly constitute important policy instruments in many countries.

2.4.1 Defining and Understanding SMEs

UNCTAD (2000) confirmed that SMEs do not consist of a homogeneous sector. They differ significantly in various national contexts as well as in many aspects of their activities and operations, ranging from local trade and retail businesses, through low technology and manufacturing-based companies, to high technology services businesses working internationally. There is no universal approach when defining SMEs. It is widely agreed that smallness confers some inherent competitive disadvantages and that some sort of external support is warranted in order for these enterprises to reach their full potential (OECD, 2004). Thus, by targeting firms most in need of support because of their size, numerous public agencies and government institutions in many countries, adopt either an employment measure or a monetary measure (capitalization, sales etc.) of size, or both. The UNCTAD (2000) study classified the SME according to the simple criterion that has been adopted by a variety of institutions: the number of employees. The United Nations considers SMEs as comprising of firms that have from zero up to 500 employees.

Ghobadian and Gallear (1997) mentioned six characteristics that differentiate SMEs from large enterprises:

- i. structure - SMEs have a relatively flat structure
- ii. procedures - SMEs adopt an ad hoc approach with a low degree of standard procedures
- iii. behaviour/culture - In SMEs, the culture and values of an owner/manager is widely spread throughout the organization
- iv. processes - SMEs tend to use simple and informal control systems
- v. people - In SMEs, training and development activities tend to be small-scale and ad hoc
- vi. contacts. - SMEs have limited contacts with major suppliers, customers and professional associations

Bouchard and Basso (2011) criticized the quantitative definition of SMEs. The typical definition of SMEs being small as measured by revenue or number of employees connotes some ingrained weaknesses. SMEs are viewed as weak and small firms that have to struggle particularly hard in order to survive. They are considered being not able to internalize technological dynamism and autonomously reach the minimum efficiency that go with economies of scale.

The review above also quoted numerous scholars who have tried to isolate the essential characteristics of SMEs. Several so-called distinctive parameters have been identified: a small size, central role of the owner or founder entrepreneur, centralized management, a low degree of specialization, an implicit strategy, little planning and poor information systems.

Based on these factors the SME is a firm where all the functions are integrated or at least highly connected, and where the owner manager controls every aspect, manages several functions and is personally involved in some of them. The owner centrality is a major characteristic of SMEs with the note that even if owner centrality is highly correlated with size, the two variables are not substitutable.

The essence of the analysis on defining the SME by Bouchard and Basso (2011) is that the linkage between size and the traditional SME is no longer considered as central or at least sufficient to define the essence of this class of firms. This work also commented that SMEs are very diverse when it comes to their strategic orientation, which can range from very entrepreneurial to very conservative. They quoted many studies, which indicate that when they compete in competitive and dynamic environments, successful SMEs tend to adopt entrepreneurial approaches, i.e. pursue strategies oriented towards innovation, being proactive and taking risks.

Although numbers may broadly be used to identify whether a company is an SME or not, Cocca and Alberti (2010) viewed that this should be completed by a set of characteristics which enable a better definition and understanding of the term SME. They completed a literature review analysing many papers focusing on SMEs in different fields in order to identify these non-numerical characteristics. All the characteristics have been grouped into two main categories: external environment and internal environment. External environment represents the context in which the SME operates and the factors essentially outside the control of SMEs. It addresses two main components: markets and customers. Internal environment includes the

factors inside the company or under the managers' control, like financial and human resources, internal processes, culture, values and the managerial practices.

With reference to the external environment, SMEs operate in highly competitive, dynamic and uncertain markets. Usually they do not have control or influence over the market and thus need to adopt a reactive approach and adapt to market changes.

SMEs rely on a limited customer base and are usually closer to the customers and have the possibility to develop more personal relationships with them. However this sometimes forces the development of submissive relationships with their customers and SMEs are often compliant to their larger customers especially their few big customers. Often the stronger customers make demands on the SMEs throughout the supply chain and this implies difficulties in collecting payments leading to fluctuations in cash flow, causing a lack of control over the future.

From an internal point of view, almost all the studies highlight scarcity of resources as one of the main problems characteristic of SMEs (Singh *et al.*, 2008). Due to lack of financial stability and security, resources in terms of personnel, physical assets and managerial time must be managed prudently. Skills are also limited, not only among staff (Singh *et al.*, 2008), but also owner-managers often do not have good managerial or organizational capabilities, implying poor strategic business planning and human resource management (Pansiri & Temtime, 2008).

Even though size represents a weakness in terms of available resources, it promotes a flat organizational structure with lack of bureaucracy and this has a positive impact on the SME being more adaptable, flexible and quick to respond to the changing markets and customer needs (Garengo *et al.*, 2005). For this reason SMEs have usually a high potential for innovation and the ability to satisfy customers' emerging and evolving requirements. Furthermore, a structure with just one or two management layers favours direct contact with employees, simplifying communication processes and offering to the manager high visibility on the processes and the opportunity to directly influence employees (Singh *et al.*, 2008).

Managers often are also the owners of the SME and the control in SMEs rests primarily with one or a few people with a high level of autonomy (Pansiri & Temtime, 2008). SME success or failure is significantly affected by the managerial and technical capabilities of the owner-manager; in fact, decisions are mainly based on the owner-manager's personal skills and intuition rather than on analysis of information. The owner-manager usually adopts a highly personalized management

style, tending to follow a ‘react and adapt’ approach and fire-fighting methods, focusing on solving short term problems and not engaging in actual strategic planning (Hudson *et al.*, 2001).

Improvements are usually incremental and there is a preference to adjust processes and systems in response to specific identified needs and to learning-by-doing approaches (Garengo *et al.*, 2005). The researcher notes that this learning-by-doing approach may fit in well with the DT iterative prototyping practice.

The review by Bouchard and Basso (2011) has other important conclusions about the links between entrepreneurial orientation and intrapreneurship in SMEs. SMEs have been the object of several studies trying to link various environmental, strategic and organizational characteristics to their level of performance. Working on a sample of 97 Canadian SMEs, Miller and Toulouse (1986) studied the personality of the manager owner, its impact on strategy and organization, and thus on performance. They summarized their findings in the following way:

- i. SME entrepreneurial orientation and manager owner personality appear to be significantly correlated. The strategy, structure, decision-making process and performance of small firms were correlated to their CEO’s personality. Traits such as flexibility, the need for achievement and locus of control are analysed in this article and correlated to SMEs’ strategic orientations such as innovation, pro-activeness and risk taking. Inner directedness (locus of control) appears to be associated to innovation, substantial delegation, limited specialization and a high level of performance in dynamic environments.
- ii. SME entrepreneurial orientation and organizational characteristics such as informality and decentralization appear to be significantly correlated.
- iii. SME entrepreneurial orientation and the industry sector’s level of technological sophistication are not significantly correlated. The strategies adopted by highly entrepreneurial SMEs varied significantly according to the level of technological sophistication of the industry to which they belonged. Strategic and operational orientations such as advertising investments, price policy, product range, preferred source of financing, customer credit policy, etc. varied significantly according to whether the SME belonged to a high-tech or a low-tech industry.

- iv. Different types of entrepreneurial SMEs can be identified. The degree of their entrepreneurial orientation seems to be correlated with some of their operational (scanning activities) and organizational characteristics (level of centralization and formality).

Kuada and Sörensen (2000) claimed that research of SMEs based in developing countries is still in an embryonic stage. There are many studies on SMEs in Malaysia (Bell, Crick & Young, 2004; Mohd Asri, 1999; Yusuf & Aspinwall, 2000) but none has focused on the design-related innovation process and relating design with strategy. This research study takes the first step to understand these pertinent issues and aims to gain a better understanding integrating DT practices to strategy and increasing the innovation profile of SMEs in Malaysia.

2.4.2 Malaysian SME Sector

Malaysia is good example of a developing country that is proactively assisting SMEs. Malaysia has a relatively well-developed SME industry supported by various government agencies like SME Corporation Malaysia (www.smecorp.gov.my), Malaysia External Trade Development Corporation (www.matrade.gov.my) and SME Bank (www.smebank.com.my). The SME industry falls under the jurisdiction of the Malaysian Ministry of International Trade and Industry (www.miti.gov.my). Currently Malaysia even has a dedicated National SME Development Council secretariat. This central agency has been mandated to undertake the coordination and evaluation of SME programs involving some 15 government Ministries and 60 agencies. All these agencies offer support to SMEs in various forms. SMEs in Malaysia outperformed the overall economy in terms of value added, employment and productivity growth. In the period 2004-2010, value added growth of SMEs had consistently exceeded that of the overall economy to average at 6.8% versus 4.9% for overall GDP (SME Plan, 2012).

Malaysia adopted a common definition of SMEs to facilitate identification of SMEs in the various sectors and subsectors. This has helped the Government to formulate development policies, support programs as well as provision of technical and financial assistance. An enterprise is considered an SME in each of the respective sectors based on the Annual Sales Turnover or Number of Full-Time Employees as shown in Table 2.3. Using this definition, SMEs constitute 99.2% of

total business establishments in Malaysia. The latest statistics indicate that SMEs contribute 32% of GDP, 59% of employment and 19% of exports (SME Plan, 2012).

Table 2.3

SME Categories in Malaysia (www.smecorp.gov.my/v4/node/14)

SME Category	Micro-enterprise	Small enterprise	Medium enterprise
Manufacturing, Manufacturing-Related Services and Agro-based industries	Sales turnover of less than RM250,000 OR full time employees less than 5	Sales turnover between RM250,000 and less than RM10 million OR full time employees between 5 and 50	Sales turnover between RM10 million and RM25 million OR full time employees between 51 and 150
Services, Primary Agriculture and ICT	Sales turnover of less than RM200,000 OR full time employees less than 5	Sales turnover between RM200,000 and less than RM1 million OR full time employees between 5 and 19	Sales turnover between RM1 million and RM5 million OR full time employees between 20 and 50

2.4.3 Malaysia SME Master Plan

Since this research involves a strategic innovation-based change agenda for a Malaysian SME it is most relevant to survey the interest in strategy and innovation within the Malaysian SME landscape. The previous sections of this literature review have always touched on the SME related issues, problems, adaptations, case examples and research interests with regards to strategy, BSC and DT. This section intends to survey the latest trends and developments in the context of the Malaysian SME policies and strategies to further determine how this research can be made more relevant to the current strategic agenda of the Malaysian SME landscape. This portion of the research is greatly facilitated by the following detailed documents available from (www.smecorp.gov.my/v4/publication):

- i. SME Annual Report 2011/12
- ii. SME Masterplan 2012-2020
- iii. SME Annual Report 2010/11
- iv. SME Masterplan to Accelerate Growth of SMEs through Comprehensive Actions including Six High Impact Programs

SME Plan (2012) highlighted the problem of low productivity among SMEs compared to large firms in Malaysia and SMEs in developed countries. SME productivity per worker averaged RM47,000, which is about one-third the

productivity of large domestic enterprises. SMEs in the United States and Singapore are seven and four times more productive respectively than Malaysian SMEs. To overcome this and other problems of the SMEs, (SME Plan, 2012) identified six growth levers for SMEs in Malaysia as shown in Figure 2.29. Innovation and technology adoption is highlighted as the core lever. The researcher notes that this thesis covers design-related innovation and capability building and thus addresses the innovation and human capital development levers.

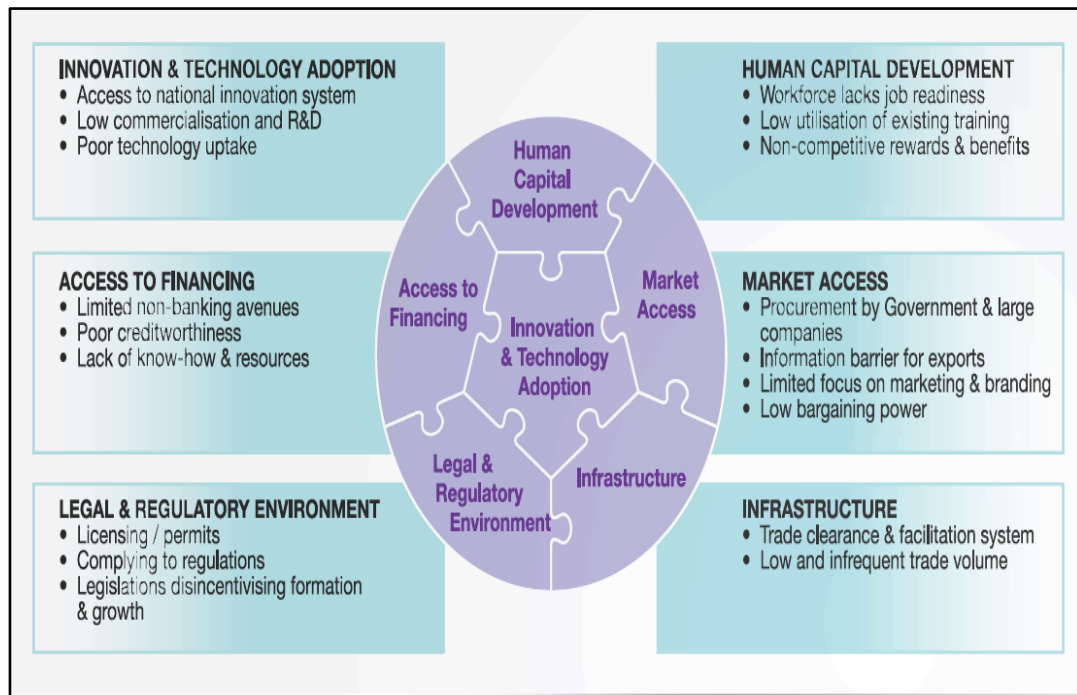


Figure 2.29
Growth Levers for SMEs (SME Plan, 2012, Chart 4.2)

Based on the six levers the eight-year master plan from year 2012 to year 2020 envisions creating globally competitive SMEs that will enhance wealth creation and social well being of the nation through the four strategic goals as summarized in Figure 2.30. The plan marks a new beginning in SME development, focusing on a fresh approach to bring SMEs to the next level by accelerating growth through **productivity gains and innovation**.

The master plan consists of six high-impact (HIP) programs (SME Plan, 2012). Two of the HIPs related to innovation may be of direct relevance to this research. The role of innovation and technology adoption in SME development has gained greater recognition in recent years. In fact, it has been noted as the most critical factor influencing the performance of SMEs in Malaysia, particularly towards driving productivity.

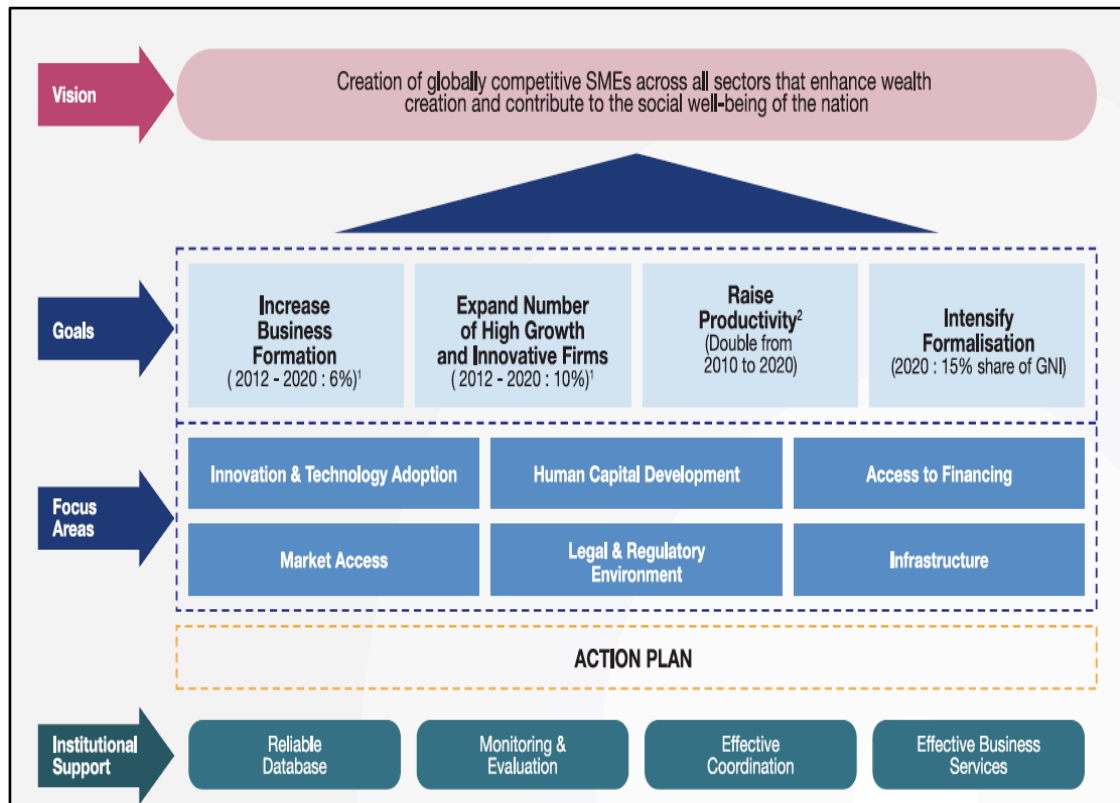


Figure 2.30
Summary of SME Masterplan (SME Plan, 2012, Chart 5.1)

Although the focus on innovation in general is a major theme of the master plan, a critical analysis of the details of the two HIPs related to innovation show there is no specific initiative to embrace design as an approach toward innovation or to promote a national design program. About the only reference to design in the master plan is related to the Research and Development program under the Ministry of Information, Communication and Culture (KPKK) through the Malaysian Handicraft Development Corporation (MHDC) to develop and produce market-oriented products that are competitive for the domestic and international markets; and to introduce the latest technology and usage of new materials in production, in compliance with the standard and quality control system. A total of 5,927 designs were produced under this program, of which 825 were commercialized. As expected the use of design is product oriented. There is no reference to design and strategy, or using design to improve innovation. Also the innovation theme seems to be limited in scope to innovation in products and services with no mention of innovation in processes or business models.

The fact that the Malaysian SME Master Plan does not highlight the role of design and strategy gives encouragement that this research is unique and not

mainstream in the Malaysian context. Research on an SME in Malaysia on how DT practices can help in developing and implementing strategy and also to increase the innovation capability of the firm is perhaps a first such case study. The importance of design in general and DT as an emerging management idea in particular, seems not to be in the current mind-set of planners and policy makers for the Malaysian SME industry. Studies have shown that design industry and competitiveness are now considered to be pertinent criteria to be managed and measured in national innovation policy (Borja De Mozota, 2011). The European Commission in 2011 also presented a package of measures to boost research, innovation and competitiveness of SMEs in Europe with a budget of €2.5 billion for programs to run from 2014 to 2020 (SME Plan, 2012). This again shows that research on SMEs and innovation is important. Thus this research could probably contribute to improvements in Malaysian SME policies and strategies.

Figure 2.31 confirms ‘Communications, Content and Infrastructure’ as one of the areas of business considered as high-value (SME Plan, 2012). The Firm is in the systems integration business and identified the e-book business as one of the ‘white space’ strategic growth areas. This confirms that the case company to be researched meets the strategic profile of the (SME Plan, 2012). Again, there is no mention of design in the details of the high-value activities.

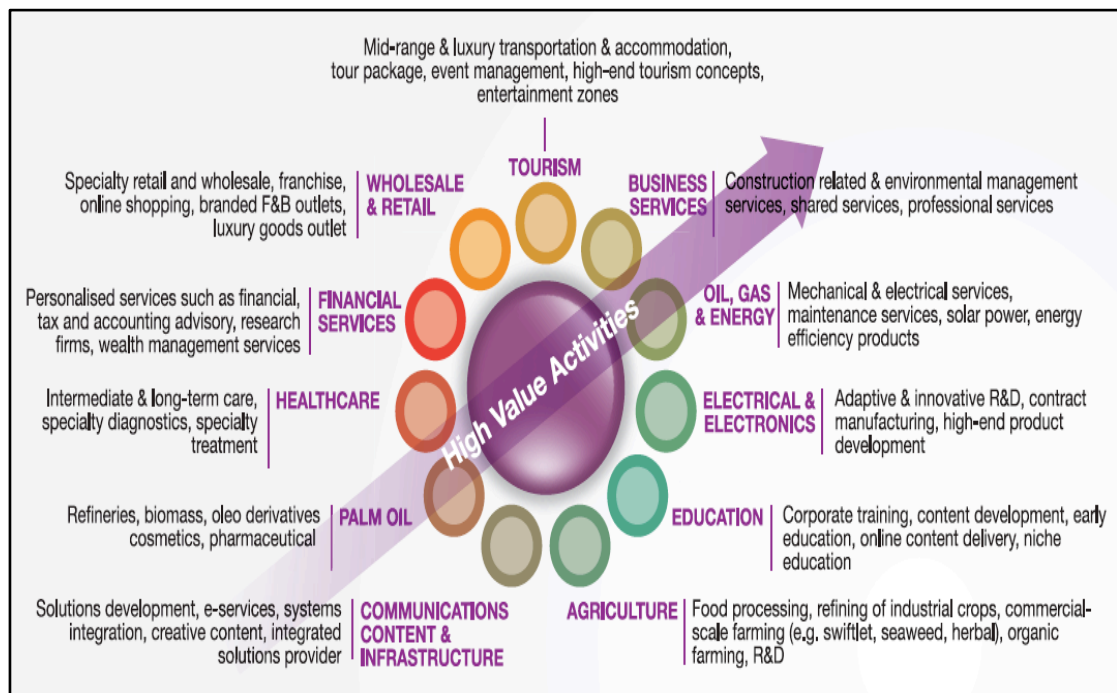


Figure 2.31
High Value Activities (SME Plan, 2012, Chart 3)

SME Plan (2012) also provided some qualitative analysis on innovation and technology adoption among Malaysian SMEs that will be useful perhaps as a guide and benchmark for The Firm. Comparative studies showed that the level of innovation of Malaysian firms was at par or higher than that of middle-income countries, but far below the levels in the high-income countries. While the Government has put in place many initiatives towards setting up a national innovation system to facilitate innovation, generally there is lack of participation by SMEs in this system. SMEs also often lack the time, manpower and funding to conduct research and development (R&D) activity and product commercialization. Technology upgrading is also viewed as a cost rather than an investment resulting in poor technology uptake by SMEs. Malaysian SMEs lack participation in the national innovation system. While universities and public institutions undertake applied research there is lack of alignment to market needs. SME collaboration with universities has also been limited due to lack of facilities in emerging areas such as green technology. SMEs in Malaysia being second-tier and third-tier suppliers have placed them further away from the technological frontier, thus making it difficult for the transfer of technology from large companies and multinational corporations.

Most Malaysian SMEs do not engage in R&D activities as the capital investment is usually beyond the means of SMEs (SME Plan, 2012, p. 52). While Malaysia offers various tax incentives to support R&D activity, only a small fraction of SMEs in Malaysia operate at the technological frontier, and thus are able to benefit from such incentives. It is also found that SMEs do not fully utilize the existing testing and incubation facilities due to perceived lack of relevance.

Another related aspect is that SMEs often face challenges in accessing financial support for commercialization of the R&D, particularly new technologies such as nano-technology and green technology. Their lack of resources also inhibits SMEs from evaluating the marketability of their innovation. Even if they do, they find it difficult to gain market access thus limiting their desire to innovate.

SMEs view productivity improvement activities as a cost rather than as a long-term investment. As such, SMEs are hesitant to invest in automation, as the long-term productivity gains may not compensate for the high initial cost in acquiring machinery or equipment. The problem is further aggravated by over-reliance on unskilled foreign labour by SMEs. The access to unskilled labour has created

disincentives for SMEs to adopt new technologies and move into higher value-added activities.

In addition to the problems related to innovation and technology adoption, SME Plan (2012) also pointed out problems that Malaysian SMEs face on Human Capital development. Inadequately educated and skilled workforce is the major constraint to growth and productivity gains. Overall, businesses in Malaysia including SMEs face difficulty in recruiting and retaining skilled workers in the technical, supervisory and managerial levels. In essence, the labour supply available lacks job readiness, hence resulting in mismatch between supply and demand. Lack of industry perspective in the curriculum, including up-to-date industry knowledge has affected the quality of students from universities, colleges, technical schools and polytechnics.

SMEs are generally reluctant to send their employees for training due to fear of disruption in work activity and staff pinching by other firms. SMEs usually perceive training as a cost and do not appreciate the long-term benefits from productivity enhancement. The lack of interest in training could also be linked to the limited availability of relevant training courses.

This portion of the literature review is mainly to put into perspective the relevance of this research to the current and future needs of the Malaysian SME industry. Undoubtedly the availability of a well-documented and up to date SME master plan (SME Plan, 2012) is extremely helpful. The researcher has also shown some weaknesses in the master plan compared to similar efforts in more developed nations for which this research can help provide improvements in the policy and strategic content. To conclude, this research which looks at developing a strategy management framework for SMEs by synthesizing DT and BSC and also studying how DT practices can increase the innovation capability of an SME, should make a significant contribution to the knowledge area of strategy and SMEs. It will also contribute to the Malaysian SME industry in terms of recent practices in innovation and also ideas to further improve the government policies and planning for the SMEs.

CHAPTER THREE

METHODOLOGY

This chapter describes the methodology used in the research and also writing of the final thesis. The use of the first person is seemingly common in recent journal articles on AR (Dick, 2002; French, 2009c, 2009d, 2009e). In this thesis the use of the first person will be limited to the learning notes the researcher observed when documenting the various AR cycles. This turned out to be a difficult and challenging part of the research because the researcher had no previous experience of the methodology and also due to the freshness of the research topic.

The researcher knew that the initial work would involve working on implementing some strategic change agenda in The Firm with the view of converting the knowledge and experienced gained into a research thesis. The work by Zuber-Skerritt and Perry (2002) was the researcher's first formal introduction to AR. AR appeared simple, action oriented, descriptive and qualitative and easy enough to start. The iterative cycles also meant that a researcher could learn about AR and improve its use as the project proceeds. The AR method is broad, flexible and rich., but the researcher realized the need for some good and credible guidelines in using AR for conducting and writing an academic thesis.

Dick (2000a, 2000b) is an excellent on-line resource for AR. Zuber-Skerritt is widely quoted on the AR philosophy, methodology and processes. The pioneering work by Perry and Zuber-Skerritt (1991, 1992, 2002) defines the guidelines for AR for post-graduate research and thesis writing. Dick (1993) also discussed how to conduct and report on an AR thesis. For a state of the art treatise on AR and its development, Handbook of Action Research (Reason & Bradbury, 2007) is a good reference. The works by Perry and Zuber-Skerritt (1991, 1992, 2002) are often cited by others on using AR for academic research writing.

French (2009a) provided a recent comprehensive review of AR through a series of articles related to strategy and SMEs (French, 2009a, 2009b, 2009c, 2009d, 2009e), which have similarities to this particular research area. The works of these authors may not cover everything in AR but are certainly sufficient and credible enough for the purposes of his research.

Appendix A.3.1 presents a brief general write-up on AR.

3.1 Research Design

AR has become identified with that familiar spiral of steps: planning, action, observing and reflecting (Abraham, Arnold & Oxenberry, 1996). The spiral actively engages both the researcher and subject in a process of learning. These action spirals of doing and learning offers a particularly different process from the traditional practices of research which typically involved researchers in social studies doing research on people, making those people the objects of research. In AR, all those engaged in it become doers and learners and the new knowledge gained is often applied toward improving the solutions to the identified problems. At times, the researcher may be able to formulate or summarize new knowledge in terms of a theory, model, method or process by comparing observations and reflections from the action spirals with contemporary academic literature.

Appendix A.3.1 discusses the definition of AR in some detail from which three key aspects are summarized:

1. It involves a group of people collaborating on a practical problem area;
2. The action researcher needs to work through a systematic and deliberate cycle of phases or stages or steps that involve planning, acting, observing and reflecting; and
3. AR ends by either solving the practical problem or documenting the learning in the form of a public report like an academic thesis of that experience and the knowledge gained. Ideally both ends are realized.

McNiff (2002) talked about self-reflective practices in defining AR. This would imply that the researcher's own story could be used as data. Alternately, a researcher can argue to use the stories of other practitioners as the basis for reviewing a particular practice (Hill, 2005).

There are various types of AR methodologies that might be applicable to different research problems. Table 3.1 summarizes the aims of the facilitator's role and the relationship between the facilitator and the participants in the three different types of AR.

Zuber-Skerritt and Perry (2002) justified the use of emancipatory AR for Master's and PhD research in the field of business management but emphasize that although a Master's thesis may constitute either practical or emancipatory action research, "a PhD thesis must be emancipatory action research" (p. 177). Dick (2002)

confirmed the view that “the field study may be done with the style and level of participation that suits you and your participants” (p. 167). This research uses the emancipatory AR methodology. Different groups are involved in the various AR cycles used in this research and the researcher was engaged at different levels of participation as a facilitator, participant and, at times, a mere observer.

Table 3.1
Types of AR (Zuber-Skerritt & Perry, 2002)

Type of action research	Aims	Facilitator's role	Relationship between facilitator and participants
1. Technical	- Effectiveness and efficiency of professional practice - Professional development	Outside ‘expert’	Co-option (of practitioners who depend on facilitator)
2. Practical	- As (1) above - Practitioner's understanding - Transformation of their consciousness	Socratic role, encouraging participation and self-reflection	Co-operation (process consultancy)
3. Emancipatory	- As (2) above - Participants' emancipation from the dictates of tradition, self-deception, coercion - Their critique of bureaucratic systematization - Transformation of the organization and of its system	Process moderator (responsibility shared equally by participants)	Collaboration (symmetrical communication)

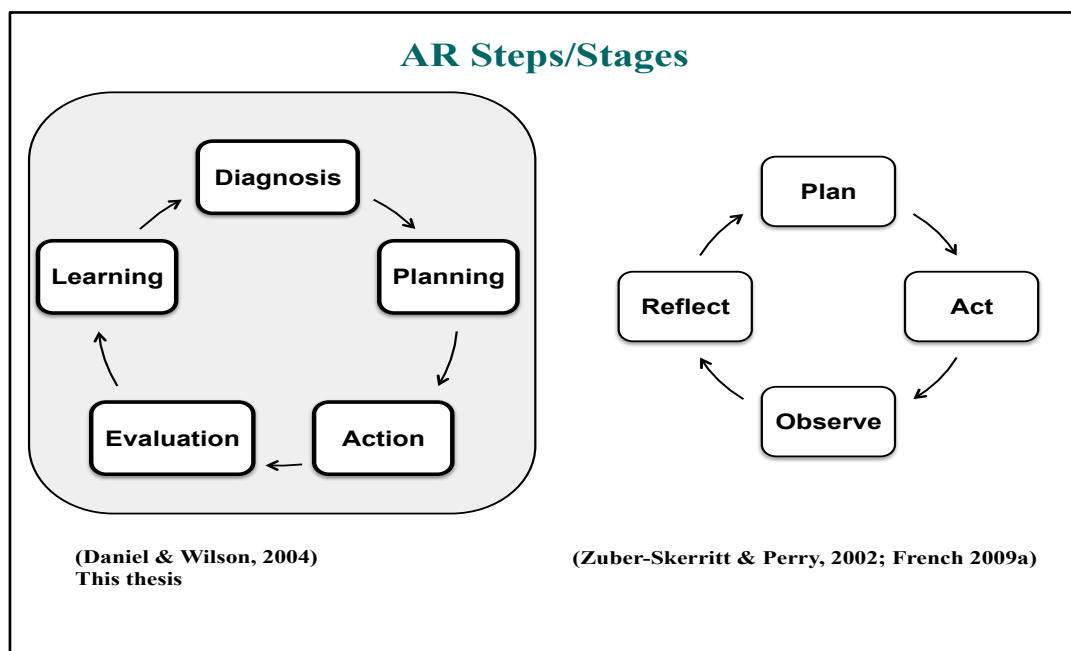


Figure 3.1
AR Stages Used in this Study

3.1.1 AR Steps or Stages

Figure 3.1 depicts AR as a spiral process of steps or stages that is repeated for as long as is required to solve the identified problem and/or achieve the research objectives. Baskerville and Wood-Harper (1996) maintained that Lewin's original model included six phased stages; analysis, fact-finding, conceptualization, planning, implementation of action and evaluation (p. 237). They commented that the AR methodology has since been revised to a five-stage process, which consists of diagnosing, action planning, action taking, evaluating and specifying learning. Perry and Zuber-Skerritt (1991) proposed a similar concept in which there are four steps for each AR cycle. The researcher prefers both the simplicity and flexibility of the original AR stages as presented in a recent work on AR applied to e-commerce using a table format (Daniel & Wilson, 2004). These stages will be used in this thesis.

Zuber-Skerritt and Perry (2002) provided a more detailed discussion on the two distinct AR projects: core and thesis AR projects. They argue that AR can benefit the organization in terms of the actions taken to solve the identified problems and in contributing to the body of knowledge related to the subject matter of the problems.

Perry and Zuber-Skerritt (1991, 2002) pioneered the work on AR for academic thesis writing. They mentioned that in traditional research, the significant distinction between a Master's and PhD thesis is that the PhD research is required to make a significant contribution to knowledge. They also clarified the differences between Masters and PhD AR theses. "In traditional research, one distinction between Masters and PhD theses is that the latter should make a more distinctive, original contribution to knowledge than the former. In action research, there are two additional characteristics of the hierarchy in Masters and PhD action research programs. A Master's core action research project needs only to progress through one major (or several minor) planning-acting-observing-reflecting cycle of professional practice to demonstrate mastery of the research methodology. In contrast, a PhD core action research project would probably need to progress through at least two or three major cycles to make a distinctive contribution to knowledge. Although these two or three cycles do not have to involve the same workgroup, the understanding gained by one workgroup in the reflection phase of the first cycle should be transferred to the next workgroup for their planning phase, that is, for the second cycle in the spiral" (Zuber-Skerritt & Perry, 2002, p. 176).

The researcher reflects that (Zuber-Skerritt & Perry, 2002) was his first reading on AR and at that time he only understood the cycles and the need to repeat the cycles and that AR is valid for PhD thesis writing. Upon starting the first cycle the ideas became clearer. The clarity of the method became more evident upon writing on the processes and the lessons learned albeit in point form. It gave the researcher the belief that AR is about **learning by doing** and that along the way the knowledge component for a PhD thesis will emerge.

3.1.2 The Action Research Spiral

The original stages by Lewin as used by (Daniel & Wilson, 2004) covered

- i. Diagnosis
- ii. Action planning
- iii. Action
- iv. Evaluation
- v. Specifying learning

The four steps of AR (Baskerville & Wood-Harper, 1996; Dick, 2002; French, 2009a; Perry & Zuber-Skerritt, 1991) are:

- i. develop a plan;
- ii. act to implement the plan;
- iii. observe the action and collect data; and
- iv. reflect on the action and re-plan.

This can be shortened to: plan, act, observe, and reflect (Figure 3.1).

The researcher prefers the original separation of developing the plan into diagnosis and action planning. It forces an analysis of the problem from the beginning and then to analyse again at the end of each cycle on the lessons learned and the improvements to be made or new solutions to be tried. These broad steps however may not be detailed enough for someone who is new to AR. The documentation model (Dick, 1999, 2002; French, 2009a) provided better structure to help the researcher follow a more thorough thought process and was most helpful in taking notes and writing up on the research. This led the researcher to combine both in a simple table with the inputs given in bullet lists as a guide (Table 4.1).

The AR process starts with a notion in the researcher's mind that a significant change or major improvement in work practice is needed. A group is then formed to

identify and clarify the practical concern that has been recognized. The group then makes the decision to work together and focus its improvement efforts on the 'thematic concern', essentially the conclusions regarding desired change that have been identified in the first AR cycle (Kemmis and McTaggart, 1988, p. 8-9). The **core group of three** comprised the researcher, The Firm's Director of Operations and Marketing Manager. Figure A.6 in Appendix A.3.6 summarizes the main strategic themes for The Firm relevant for the planning period from 2010 to 2013. 'Growth through Innovation Capability' is the general 'thematic concern' in the AR study reported in this thesis.

From the researcher's experience, the first action cycle is critical. An action is set into motion and the **learning by doing** starts. Otherwise the change effort gets trapped in a series of discussions and meetings with no action. It then starts an action-oriented momentum of further action cycles. The group is then required to work through the spiral of AR stages until the required change effort is implemented and the learning objectives are met. Not all the change objectives or the learning objectives may be achieved at the same times, so the cycles may continue with different degrees of emphasis on the action part or the research part. Dick (2002) confirmed this view; "Action research does not require extensive preparatory reading, extensive early data collection or complete analysis. It lends itself to early action. It does not even require that you have a research question or 'thematic concern' to begin (Kemmis & McTaggart, 1988), though one may well be useful. It is enough to have a research situation. After you begin to take action you will soon begin to identify the thematic concerns" (p. 167).

One fundamental philosophy of the AR cycles is the concept of looking forward and looking backward (Kemmis & McTaggart, 1988). It is relating reflective understanding, reached through evaluation and learning to future action and plans for action. The plan by definition must be prospective to action – that is, looking forward. Action is reflectively guided by planning as it looks back to planning for its rationale, but the causal link is vague. Evaluation has the function of documenting the effects of action – it is prospective in that it will always be guided by the intent to provide a sound basis for critical learning and self-reflection. Reflection is retrospective because it looks back to evaluation to locate problems and make sense of them. French (2009a) interpreted both of these concepts, looking forward and looking back, to indicate that the whole AR spiral process is more complex than the

simple linear models described in the literature would suggest. This concept is also consistent with Dick's (1999) documentation model.

The starting point of AR is to identify the problem, suggesting that a 'diagnosis' of the stated concerns is needed. Whether called diagnosis or notion, the concept is that there is an initial step where the problems or opportunities that have led to the idea that an AR project is worthwhile, are discussed and developed.

Then the project goes into various Diagnosis-Plan-Act-Evaluate-Learn stages. Kemmis and McTaggart (1988) suggested that the plan must be flexible enough to adapt to unforeseen events because there is some degree of unpredictability and risk in all workgroup related change efforts. The group members or participants in the AR project then act to implement the plan and use learning from the action as a platform for the further development of follow-up action plans. Action is guided by the planning in that it looks back to the planning phase. The action is observed to collect data and information for thorough evaluation and learning. The observation looks forward to and provides the basis for the reflection phase. Careful observation is necessary because the action will be constrained by reality. Observation should be planned, but it must be responsive and flexible so as to record the unexpected (Kemmis & McTaggart, 1988).

The reflective or learning stage is the heart of AR (Dick, 1999). It is supposed to provide the researcher with important insights with which to move the process forward. This stage includes the data analysis. The researcher is the sole arbiter of the analysis but must be aware and take steps to include the interpretation of others. This is vitally important because they may provide insights that were not obvious to the lone researcher. Reflection of the action recorded during observation is usually aided by discussion among the participants. Group reflection can lead to a critical review of the meaning of the social situation and provides a basis for further planning of critically informed action, thereby continuing the cycle (French, 2009a).

These steps seem ordinary and somewhat natural, allowing for flexibility of the AR method. The AR documentation model (Dick, 1999) allows this flexibility to be guided in a more careful, systematic, and rigorous way. The documentation model covers these three components before the action:

- i. the outcomes you hope to achieve in this next cycle, and why you think they are worth pursuing

- ii. the contribution you expect those outcomes to make to your long-term goals, and why you expect it
- iii. the actions you plan to take to achieve those outcomes, and why you think those actions will achieve those outcomes in that situation.

After the action, the documentation model asks:

- iv. what actions you carried out, and what outcomes you achieved
- v. how and why these differed (if they did) from what you expected
- vi. what you learned about the client system, your methodology, yourself, and so on.

The final point is the heart of the research component of action research. It represents the researcher's growing understanding. It is probably from this learning that the contribution to knowledge will arise (Dick, 1999). The 'why' questions before the action help the researcher identify the expectations and assumptions. Comparing plans to reality then helps identify which of those assumptions and expectations were incorrect and need to be improved, and that is the 'something learned'. Upon further research of the academic literature and believing that the 'something learned' can perhaps contribute to new knowledge, qualifies the research for a PhD level thesis.

3.1.3 Developing an AR Guide and Checklist

Dick (2002) suggested that much of the literature on AR does not explain in detail how AR is done. There is no practical 'to-do' list for completing an AR project. He contended that this should be of little concern to researchers considering the use of AR, as researchers can be vigilant in ensuring that their chosen methods are consistent with both the action and the research aims of the project. The researcher views that although this flexibility may augur well for experienced AR practitioners, first time thesis writers using AR need some form of documentation guide that can be referenced and used consistently.

The structure French (2009a) developed utilizing the philosophies of AR is a useful practical guide. Perry and Zuber-Skerritt (1991) provided a list (Appendix A.3.3), which asks two questions in six parts. French (2009a) used this list as the starting point for an AR 'checklist'. Then as the AR proceeds and is eventually written up, the seven-part structure is used. Appendix A.3.3 shows how this research

complies with the seven part structure. Dick (1999) documentation model is used to question the AR process and the use of this structure is demonstrated in various AR cycles related to the same research problem (French, 2009b, 2009c, 2009d, 2009e). This facilitates a consistent approach to the thesis writing cycle described in Figure 3.2 and in response to Dick's (2002) concern of the apparent weakness of the AR literature in explaining in detail how AR is actually done.

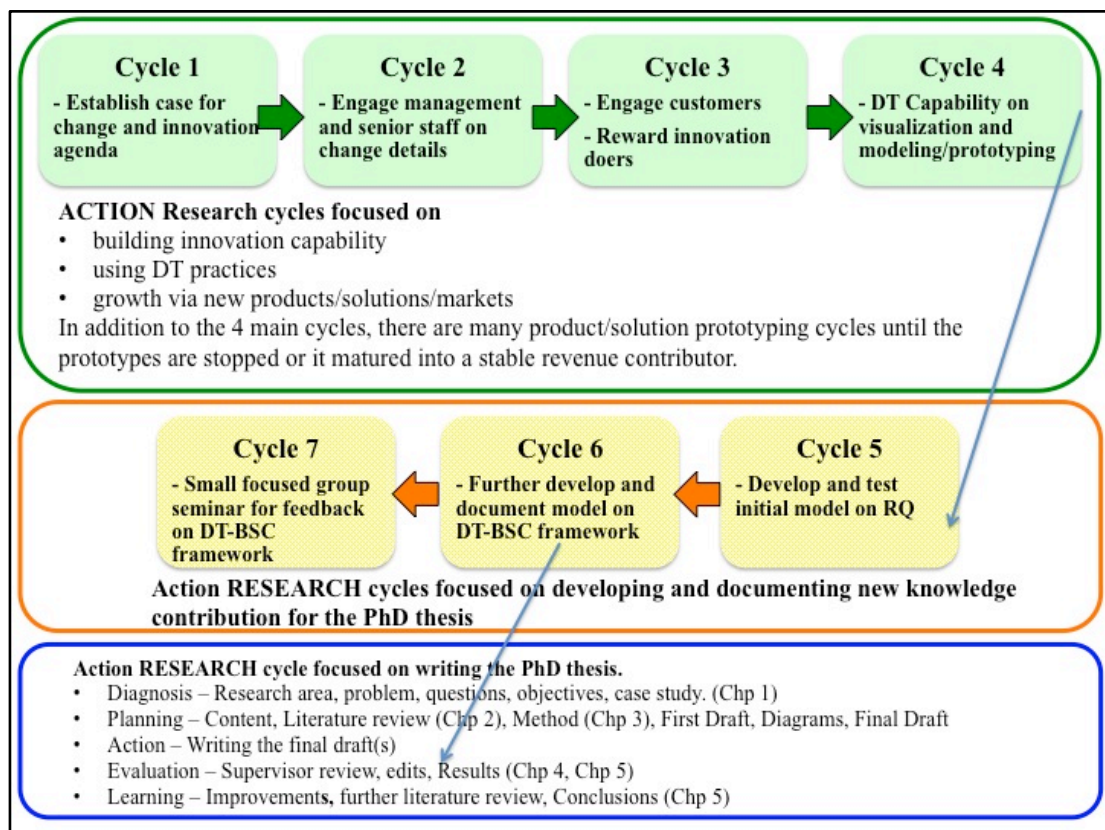


Figure 3.2

7 Major AR Cycles

Figure 3.2 shows the seven major AR cycles used in this study. The first four AR cycles are focused on the research problem. As the knowledge contribution emerged from these four early cycles, the final three AR cycles focused on the research question. The thesis writing is also depicted as an AR cycle (Zuber-Skerritt & Perry, 2002). The arrows show the transitions from the problem solving to the knowledge creation and thesis writing phases.

Table 4.1 shows the first notes made using a combined version of the documentation model (Dick, 1999, 2002; French, 2009a) and the presentation by Daniel and Wilson (2004). Although it is in point form it shows the benefits of starting the documentation as early as possible. AR promotes learning by doing and action, and the learning only becomes explicit through actual documentation.

3.2 Justification for the Methodology

French (2009a) referred to many writers who have discussed the application of AR to research opportunities in management and concluded that AR is an appropriate methodological tool to be applied to management and organizational research problems. Sankaran and Tay (2003) studied the work of several authors and concluded several reasons why AR is attractive to practicing managers:

- i. It uses action as an integral part of research. It integrates thought and action.
- ii. It is focused on the researcher's professional values rather than purely methodological considerations.
- iii. It allows practitioners to research their own professional activities.
- iv. It helps to improve practice at the workplace.
- v. It helps managers in their professional development by critically examining their own beliefs and practices.
- vi. It helps managers to be multidisciplinary and work across technical, cultural, and functional boundaries.
- vii. It helps managers in implementing change effectively. AR is founded on research relationship in which those managers involved are participants in the change process. It pursues both change in the form of action and understanding through research.
- viii. It is problem-focused, context-specific, and future-oriented.
- ix. It helps to develop a holistic understanding.
- x. It can use a variety of data collection methods.

Zuber-Skerritt and Perry (2002) argued that AR is more appropriate than traditional research for improving practice, developing professional competencies and organizational learning. They clarified the difference between core AR that is collaborative, participatory AR aimed at practical improvement in a learning organization and thesis AR that is independent AR in preparing the thesis to demonstrate some mastery of research processes and make an original contribution to knowledge. AR has been successfully utilized as a research methodology in many academic disciplines. The view of Perry and Zuber-Skerritt (1991, 1992, 2002) that

emancipatory AR is the methodology of choice for AR PhD projects in the management discipline has been widely accepted (French, 2009a, p. 199).

Daniel and Wilson (2004) suggested that AR provides a methodology that is well suited to dynamic or turbulent or fast-changing environments. They used the example of e-commerce. This research problem uses both e-commerce and mobile commerce. They said that AR places an emphasis on the immediacy of outcome and recognized that in turbulent domains, the limited practical experience of the field may rest primarily with practitioners rather than academics.

It is clear that AR is a valid, widely accepted and established methodology for PhD research in management. Section 1.3 and Section 1.7 argued that this research problem in integrating the BSC framework and DT for strategy management is rather new. There are no reference papers or case studies apart from the work by Borja de Mozota in Section 2.3.8. Thus an appropriate choice is to research the problem in action and be engaged in the process both as a facilitator/researcher and participant. These have all the elements of emancipatory AR, which is suitable for a PhD AR research (Zuber-Skerritt & Perry, 2002, p. 177).

There are also similarities between AR and DT. Both are action-oriented and involve learning by doing and participation. AR heavily involves collaboration between the researcher and the participants just like the collaboration between the designers, other team members and users in DT. The AR iterative cycles are similar to iterative prototypes in DT. Interestingly, DT is often associated with 'wicked' problems and AR for 'messy' research (Parkhe, 1993), where the problem gets more clearly defined as we progress in finding the solution.

The researcher found the most comfort from French (2009a, 2009b, 2009c, 2009d) and Daniel and Wilson (2004). French applied AR and a more detailed documentation model adopted from Dick (1999) on research related to strategy and SMEs in Australia. This provides credibility and comfort to this research which also involves strategy and SMEs. The documentation guide was a great help. Some ideas particularly on the seminars in Cycle 7 of this research were adapted from French (2009c). Daniel and Wilson (2004) argued strongly for the use of AR in turbulent environments and used AR to develop simple models on how to prioritize e-commerce projects in organizations. Thus there is sufficient reference from the literature using AR in studies that have some similarities with this research. These references validate and provide guidelines for the use of AR in this research.

Zuber-Skerritt and Fletcher (2007) referred to what Kurt Lewin called the ‘thematic concern’ as of primary importance. The actual research thesis topic is secondary and should be aligned to the primary concern. An organization would only allow a research student to do fieldwork in their workplace and use their valuable time and resources only if the research enables action (i.e. practical improvement, professional and/or organizational learning) and therefore change or development for the better for the organization. (Before Cycle 1 the broad thematic concern was ‘Growth through Innovation Capability’. As the research progressed it was refined to ‘New growth by increasing the innovation capability of The Firm through the use of DT’. From that effort the researcher compared the learning in action to academic literature and formulated a framework that can be a potential contribution to knowledge in strategy management for SMEs.)

AR is a member of the case-study family of methodologies (Dick, 2002). The unique element of AR that differentiates it from other forms of case study is the participation of the researcher. In AR the researcher is not separated from the research case but is an intimate part. Sometimes the researcher is the driver of the research project and a management consultant, as in this case. Thus the researcher had to take deliberate considerations to reference his work diligently and to be careful about generalizing the conclusions of the research. This led to the focused group discussions in Cycle 7 to further validate the proposed framework.

As discussed there are many varieties of AR. While there is much to be found in the literature, there are limited detailed guidelines as to how AR is actually done. French (2009a) described an AR guideline that has both practitioner and academic validity and applied the guideline on a research problem related to strategy and SMEs in Australia (French, 2009b, 2009c, 2009d, 2009e). French (2009a) commented, “Many practicing managers wishing to pursue a higher degree and develop change in management practice can be confident that applying this methodology will be acceptable” (p.199). Appendix A.3.3 comments on how the AR approach used in this study complies with the guidelines by (French, 2009a).

3.3 The Unit of Analysis and Sources of Data

In traditional research methodologies there is often a specific accepted method of data collection that is symbiotic with the data analysis methodology. French (2009a) concluded that in AR this is not generally the case and mentioned the understanding among action researchers that AR does not require any special method of data collection.

As summarized in Table 4.1, the innovation project teams from The Firm were the first units that provided the initial data for the research. As the strategy framework in response to the research question was formulated, it was presented and discussed through a series of seminars and interviews with various other participants that covered strategy practitioners, potential users, policy makers and also academics.

AR is truly a learning by doing and action methodology. Once the major concern of implementing a broad strategic change agenda on ‘new growth by increasing the innovation capability of The Firm through the use of DT’ was broadly articulated, the researcher proceeded with various AR cycles until the broad contribution to new knowledge for the PhD thesis evolved. The remaining AR cycles then focused on participants to provide data for completing the knowledge research. Thus the nature of participants and the sources and types of data changed as the AR cycles evolved from implementing a strategic change agenda to developing the framework as a contribution to new knowledge.

For this project, data was taken from several sources:

- i. the academic literature;
- ii. committee meetings – observation notes and minutes;
- iii. The Firm’s knowledge base, portal and Wiki;
- iv. the workshop series – observation, discussion, pictures, workshop notes, flip charts, PowerPoint presentations and debriefing notes;
- v. the small focus group series – observation, discussion, seminar notes, and debrief;
- vi. notes from The Firm’s management meetings;
- vii. the strategy of The Firm;
- viii. the observation and reflection notes for each AR cycle mainly through pictures, video clips and prototypes.

- ix. customer feedback on the prototypes and actual sales of some products and solutions
- x. sales data per product line and country of purchase from Apple iTunes AppStore
- xi. Facebook page fan by country data from facebook.com
- xii. The Firm's audited financial statements from 2009 to 2012 and the unaudited financial report for 2013

The final three data sources provide quantitative measures related to the research problem, 'New growth by increasing the innovation capability of The Firm through the use of DT' and the strategic outcomes in Figure 4.18. In Section 2.3.2, Skarzynski and Gibson (2008) separated out measures that relate to the innovation process, innovation skills related to people and leadership, funding and the outcomes of the innovation effort. In line with Figure 4.18 the focus is on the outcomes. From the examples they gave, percentage of new revenue was chosen. Obviously it is **best to quantify the outcomes** of any strategic change effort. Here, **simple measures** are chosen to be consistent with the underlying basis that it must be simple for SMEs to use. Revenue growth from new products or services is also the first among the top ten outcome metrics related to innovation (Section 2.3.2). Thus revenue and revenue growth from new products or services are the two simple measures related to the research problem and will be taken from The Firm's financial reports. This makes The Firm the unit of analysis in addressing the research problem. There are other outcome measures related to the research problem and the strategic change agenda (Figure 4.18), but as mentioned in Section 1.4.5, the scope of the research on measures is limited to simple financial outcomes to indicate success in implementing the strategic change agenda. Section 2.2.5 and Section 2.2.6 also explain why measures must be kept simple in the case of SMEs.

The 'e-book business' was clearly the 'white space' product relative to The Firm. Prior to the start of the strategy, The Firm had zero presence in any form of business-to-consumer (B2C) transactions. Of all the ideas related to The Firm's strategic change agenda, this was relatively the most innovative. Thus this strategic idea is the best proxy of The Firm's planned increase in its innovation capability being applied to innovating a business model. The progress of the e-book business is the best example of the success of the innovation agenda of the Firm. As such, its progress from an idea to actual revenue generation from a global consumer base will

be reported in this thesis using data from Apple iTunes AppStore and Facebook. Thus the 'e-book business' is the unit of analysis in addressing this particular research objective.

The data collection methods included:

- i. participant observations;
- ii. general discussions;
- iii. debriefing meetings;
- iv. review of official meetings;
- v. review of official documents, pictures and PowerPoint presentations;
- vi. review of the plan for each AR cycle;
- vii. The Firm's financial reports; and
- viii. On-line data from Apple iTunes AppStore and Facebook.

3.3.1 Data Analysis

Qualitative data analysis occurs during the reflective moment of the AR cycle. The reflective stage has the purpose of providing the researcher with important insights with which to move the process forward. The researcher was aware and took steps to include the interpretation of others from the core team and insights elicited through discussion or through the deliberation of participants. This is vitally important because they may provide insights that are not obvious to the lone researcher. The short notes from the reflective stage are presented in Tables 4.1, 4.2, 4.3 and 4.6.

The following quantitative measures were extracted from the financial performance data of The Firm.

- i. Revenue, since the main value gap that required the strategic change agenda was to achieve the MYR 50 million in revenue
- ii. Revenue per Employee Cost is a good productivity measure. The increased innovation capability should lead to increase in productivity.
- iii. % new revenue, as a simple outcome measure for innovation.
- iv. Investments growth, since one of the strategic outcomes of The Firm is to grow its investments. This is presented for completion although the investment strategy is not part of this research.

Some simple analysis using an Excel spreadsheet was done to present the measures to show performance relative to the financial period before the start of the strategic planning period.

The following quantitative measures were used to analyse the progress of the ‘e-book business’

- i. Downloads per application to show the growth trend for each of the applications sold in Apple iTunes
- ii. Downloads from the country of purchase from Apple iTunes to show the growth trends of the global customer base
- iii. Growth trend of the Facebook fans per country

Again some simple spreadsheet analysis was done to represent the raw data into meaningful trends using tables and visual charts.

It is important to keep the measures simple and the sources of data easily available. Since SMEs suffer from lack of resources, the measures should be simple, synthetic and easily collectable, otherwise the effort needed for measuring would be higher than the benefit gained. Similarly, the procedures for measures collection should be well defined and resource effective. Moreover it would be better to use only a few vital measures, preferably presented in a visually effective way, so as to enable the manager to focus only on key performance factors and quickly take informed decisions (Cocca & Alberti, 2010).

3.4 Procedures Used to Collect Data

No special instruments or procedures were used to collect the raw quantitative data, consistent with the observation that data collection must be kept simple for SMEs (Section 2.2.6). The four quantitative measures on the financial performance were extracted directly from The Firm’s financial accounts. The slight setback is the unavailability of the audited accounts of The Firm for the final financial year 2013. The three measures for the ‘e-book’ project were extracted from the standard data provided by Apple iTunes and Facebook. Excel was used to analyse the raw data and present the results to be discussed in Chapter Four. As mentioned earlier, it is important to keep the measures, sources of data and its analysis simple. These seven measures will be used to address the results related to the research problem.

The research question on ‘how to develop and formulate a new, simpler and more action-oriented approach for strategy development and implementation for SMEs that integrates DT and the BSC’ will be addressed based on the qualitative evaluation and learning from Cycles 1 to 7 and comparisons with the literature.

3.5 Limitations of the AR Method

Denscombe (1998, p. 64-65) suggested that it might be argued that the findings from an AR process will rarely contribute to broader insights because of the constraints on the scope of AR projects. Because they are often located in the researcher’s workplace, the prospects of the data being representative are poor. Also, the research is generally focused on the one site rather than spread across a range of sites and hence AR is vulnerable to the criticism that the findings relate to one instance and should not or cannot be generalized beyond this specific ‘case’. This argument however, could be broadly applied to all case studies, of which AR is a specific type. “AR can be seen as a variant of case research, but where a case researcher is usually an independent observer, an action researcher is a participant in the implementation of a system, but simultaneously wants to evaluate a certain intervention technique” (Westbrook, 1995, p. 8).

This reservation needs to be acknowledged. It is important for the action researcher to avoid making grandiose claims on the basis of AR projects (Denscombe, 1998, p. 64-65). However, it can be argued that AR, though practice-driven and small-scale, should not lose anything by way of rigor. Like any other small-scale research, it can draw on existing theories, apply and test research propositions, use suitable methods, and offer evaluation of existing knowledge.

Dick (1993, 1999, 2000a, 2000b, 2002) thoroughly discussed the problems related to using AR particularly for PhD theses, in comparison to the normal quantitative research methods. The main issues that are of relevance to this research relate to rigor, validity, reliability and generalizability. This AR study has two main parts as shown in Figure 3.2. The ‘action’ part of the AR study seeks to address the practical research problem that is local and specific to The Firm. Quantitative measures extracted from data sources that are easily referenced are used to present the results related to the research problem while the major activities involved are described qualitatively through the first four AR cycles (Table 4.1). The data sources

are easily available and referenced. The measures will be used to basically show whether The Firm succeeded in implementing the strategic renewal agenda. The quantitative measures are explained in Section 3.3.1 and the detailed results are shown in Section 4.1. It meets the normal rigor, validity and reliability criteria of quantitative research in that the quantitative data has been selected to confirm the success of the overall strategic change agenda in meeting the financial targets and the success of the most innovative project within the strategic change agenda.

The ‘research’ part of the AR study seeks to address the research question that requires extending and generalizing the learning that is local and specific to The Firm to the much broader SME community. Herein lies the major challenge of validating and generalizing the learning specific to the particular situation and use it to ‘develop and formulate a new, simpler and more action-oriented approach for strategy development and implementation for SMEs that integrates DT and the BSC’.

Dick (2002) pointed out several ways in which some generalizability can be claimed for the findings of AR. For example, if several studies in diverse settings give similar findings, this allows greater generalizability than a single study typically does. Similar actions may produce similar outcomes in different situations; this implies generalizability. For this thesis, the researcher has chosen to use the literature to refine, validate and challenge his own ideas and experiences. At the end of it all, the research has to make a contribution to knowledge. Surveying the literature will help support and generalize the new framework or concepts from the findings through the AR cycles. The researcher has combined the literature study and the AR cycles concurrently as shown in Figure 3.2.

The rigor of the research methods is addressed by

- i. using a cyclic approach, with each cycle involving data collection, interpretation, and literature search through seven major AR cycles;
- ii. working, as far as possible, with two or more sources of information. In Cycle 1, Cycle 2 and Cycle 4 the same idea generation techniques and formats were used by different workgroups. In Cycle 7 the focused group discussions covered different potential users, BSC practitioners and academics.
- iii. testing the interpretations stringently by searching out exceptions to the explanations, and explanations of the ambiguities mainly through

literature and focused group discussions as in Cycle 7. Also through discussions with experts from the customer side as in Cycle 5.

Working with two or more sources of information might be called 'dialectic'. It is similar to what is often called triangulation in research (Dick, 2002). Any two or more sources of information can serve the purpose of creating a dialectic like the different informants, or different but equivalent samples of informants used in Cycles 1, 2, 3, 4 and 7.

To conclude this section, the researcher is aware of the limitations of the AR methodology and that this AR study addresses the concerns being raised. As such the conclusions drawn, especially when addressing the research question, must be further supported. This will be elaborated in Chapter Four.

3.6 Ethical Issues.

There are no major ethical issues related to the methodology except that The Firm is a private company and some of the financial, operational and strategic information may be confidential. Thus the quantitative measures involving the financials will be reported relative to the year before the strategic planning period.

The customer organization in Cycle 5 also has some confidential information that is not reported.

This research is not supported by any grants that limit the publication of certain results or findings.

The researcher also tried to verify that a reference does actually say what the thesis says it does.

French (2009a) quoted the position described by numerous writers in the literature that both positivist and qualitative methods and their associated techniques have a significant role to play in generating, assessing, and expanding theory. Thus there is no doubt that AR is a valid research methodology that can lead to the creation of new knowledge.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

This chapter describes the results and analyses them for their relevance to the research problem and question as articulated in Chapter One.

4.1 AR Cycles Related to the Research Problem

As shown in Figure 3.2, AR Cycles 1 through 4 are the main cycles related to solving the research problem. Table 4.1 shows the first notes made using a combined version of the documentation model developed by French (2009a) and the AR stages used by Daniel and Wilson (2004). The table format is used for better presentation. Although it is in point form it shows the benefits of starting the documentation as early as possible. AR promotes learning by doing and the learning only becomes explicit through actual documentation.

The greatest value gained in the documentation guide was to use it as early as possible in the AR project albeit in short note points. Early documentation greatly helps in the learning. This note is supported by Dick (2000b) who further promoted regular, systematic and critical reflection, and viewed that continuously documenting, carefully but economically, helps provide the understanding that accrues to become the researcher's contribution to knowledge.

The same table format is used to document all the remaining major AR cycles. This section also summarizes AR cycles 2, 3 and 4 through Table 4.2, Table 4.3 and Table 4.4 respectively. As mentioned in the beginning of Chapter Three, the researcher used the first person in these tables since the points reflect his personal observations and notes.

Obviously there are many AR cycles involved in the research and only the major ones are presented here. Different workgroups or participants are involved in the various cycles. The researcher acted as a facilitator on some management frameworks used in the AR cycles like BSC, DT and also workshop collaboration techniques like Timeline and World Café. He also facilitated the discussion with the practitioners and participants, so as to identify potential underlying problems and assumptions and allow the researcher to become a collaborative member of the group. These factors have all the elements of emancipatory AR (Table 3.1), suitable for a PhD AR research (Zuber-Skerritt & Perry, 2002).

As mentioned in Section 3.1, the AR process starts with a notion in the researcher's mind that a significant change or major improvement in work practice is needed. This AR started with trying to solve a problem related to the strategic themes of The Firm as shown in Figure A.6 in Appendix A.3.5. A **core group** comprising the researcher, The Firm's Director of Operations and Marketing Manager was then formed to work together and focus its improvement efforts on the strategic change agenda related to 'Growth through Innovation Capability'. The 'thematic concern' was later on changed to '**New growth by increasing the innovation capability of The Firm through the use of DT**'.

Cycles 1 through 4 are reflective (Hill, 2005; McNiff, 2002). It summarizes the problem solving cycles and the learning generated. From Cycle 3 onwards the awareness to convert the AR project into a PhD thesis led the researcher to relate the learning from the action to academic literature. Several minor AR cycles related to the product development and process improvement efforts are not included in the table since it has no significant contribution to the thesis. The researcher purposely included these main cycles to show how AR for problem solving evolved into AR for the proposed contribution to new knowledge; a simplified framework for strategy management for SMEs and the learning from integrating DT and the BSC.

Section 4.2 presents the financial outcome measures related to the research problem that is described qualitatively in the coming tables. Section 4.2.1 presents the quantitative results and progress of the mobile and e-commerce e-book prototype and the related AR prototyping cycles. It also shows how DT contributed to an innovation based growth for The Firm in the global mobile commerce market.

Table 4.1
Summary Documentation of Cycle 1

Stage	Cycle 1: Open Innovation Day (June 2010)
Diagnosis	<p>The outcomes you hope to achieve in this next cycle, and why you think they are worth pursuing?</p> <ul style="list-style-type: none"> - Present case for change • BHAG (Collins & Porras, 1994) 50M revenue • Need quantum in-organic growth • Innovation agenda • Looking for the ‘white space’ - Buy into growth vision - Buy into importance of innovation - Leadership shows commitment to innovation - Gather broad ideas from all • Divergence (Brown, 2009) - Generate awareness on DT through first formal knowledge sharing session
Action planning	<p>The contribution you expect those outcomes to make to your long-term goals, and why you expect it?</p> <ul style="list-style-type: none"> - Form a core group to manage this strategic change; owner (researcher), senior manager and support staff - Some ‘white space’ profitable business ideas - First formal step in nurturing innovation culture and capability - All to commit to growth and innovation agenda since all will benefit from it • Share in the financial success • Possess a valuable capability; innovation, as another proof that the company acts on its mission to “attract and develop knowledge workers” - I learned from experience and literature that the key to successful change is to follow-up diligently (Bossidy & Ram Charan, 2002) and to demonstrate early success or ‘quick-wins’ (Kotter, 1996) - Prepare for new practices related to DT
	<p>The actions you plan to take to achieve those outcomes and why you think those actions will achieve those outcomes in that situation?</p> <ul style="list-style-type: none"> - Practical workshop using collaborative techniques like World Café, Timeline, Open Polling/Voting etc. (Brown <i>et al.</i>, 2005) - Generate broad ideas - Encourage and practically learn strategic planning with simple techniques - Practically engage staff to gain their buy-in and to communicate message that leadership has a vision but let us develop the strategy together and make it work together

Table 4.1 (Continued)

Action	<p>What actions you carried out, and what outcomes you achieved?</p> <ul style="list-style-type: none"> - Conducted Innovation Day 2010 (Appendix A.3.6) • One day practical workshop open to all staff • Timeline, World Café techniques • Group work and presentations • Open voting/polling • T-shirt memorabilia - Great buy-in from all - Great historical feedback on strategic and operational matters (see Figure 3.5) - List of business and project ideas with initial detail (see Figure 3.8) • New ‘white space’ ideas like mobile applications and e-commerce • Simple internal improvement ideas like corporate shirt
Evaluation	<p>How and why these differed (if they did) from what you expected?</p> <ul style="list-style-type: none"> - Support from the participants was excellent throughout the cycle. Initially, we had some doubts about the attendance and participation in the workshop especially from the newer staff but the open techniques allowed for all to contribute at least in writing and posting their short comments or voting on ideas and comments.
Specifying learning	<p>What you learned about the client system, your methodology, yourself and so on?</p> <ul style="list-style-type: none"> - Open collaborative and participative techniques helped to make the workshop lively and allow everyone to contribute - Simple constructs and templates like 2x2 quadrants help to translate ideas like ‘white space’ (Hamel & Prahalad, 1996) in ways that allow participants with no knowledge of core competencies (Hamel & Prahalad, 1996) to generate working ideas. - For SME owner/founder active participation in workshop cements leadership commitment to change as per SFO principle 1 (Kaplan and Norton, 2000) - Implementing a simple good outcome from the workshop will reinforce that leadership is serious about the ideas. • Decided on ‘corporate shirt’. • Simple to do and also has a design element to it. - At this very early stage of the project, throughout the processes of Cycle 1, we had little conception of the eventual scope of the project, which would take more cycles. For success, the project needed champions dedicated to the success of the project. The core group did very well in this cycle and would remain active during the ‘public’ stages of the project until the completion of Cycle 4. With the objectives of Cycle 1 achieved, the process was reviewed and Cycle 2 was initiated. - There were no written minutes for the workshop or any written report. All documentation was through pictures, flip charts and video clippings. I purposely introduced DT visualization practice. In retrospect, I found a reference on major contributions of rich pictures and metaphors on organizational change management (Ragsdell, 2000). - More interestingly (Langer & Thorup, 2006) reported on the results of the organizational change process in a case company using photographs and brief storytelling for strategic change communication.

Table 4.2

Summary Documentation of Cycle 2

Stage	Cycle 2: Management Innovation and Strategic Planning Workshop (Feb 2011)
Diagnosis	<p>The outcomes you hope to achieve in this next cycle, and why you think they are worth pursuing?</p> <ul style="list-style-type: none"> - Need managers and senior staff commitment and more thorough awareness of strategic planning and innovation agenda - Need ideas and plans from the various departments how to close the revenue gap over 3 years - Follow up from Cycle 1. Without follow up the outcomes from Cycle 1 will not be implemented. - At this early stage the core team was unsure how to implement the growth through innovation agenda since all staff were also busy with current operations. Need to identify change agents/champions and also workable structure
Action planning	<p>The contribution you expect those outcomes to make to your long-term goals, and why you expect it?</p> <ul style="list-style-type: none"> - Support and commitment for growth/innovation agenda from management and senior staff - Identify leaders for the various project ideas from Cycle 1 - Practically (learn by doing) build strategic planning and innovation capabilities among managers and senior staff
	<p>The actions you plan to take to achieve those outcomes and why you think those actions will achieve those outcomes in that situation?</p> <ul style="list-style-type: none"> - Repeat company mission, vision and values - Repeat growth and innovation agenda - Formally introduce some DT practices - Convert outcomes from Cycle 1 from ideas to simple project plans for the prototypes. <ul style="list-style-type: none"> • With project plan, core team can now follow up on deliverables.
Action	<p>What actions you carried out, and what outcomes you achieved?</p> <ul style="list-style-type: none"> - Guided practical workshop using simple templates - Started some simple DT practices like collaboration - Better understanding of mission, new vision, current and new strategy - Departmental contribution on how to close the revenue and other gaps
Evaluation	<p>How and why these differed (if they did) from what you expected?</p> <ul style="list-style-type: none"> - Some of the ideas from Cycle 1 were revamped

Table 4.2 (Continued)

Specifying learning	<p>What you learned about the client system, your methodology, yourself and so on?</p> <ul style="list-style-type: none"> - Translate case for change into workable project ideas. <ul style="list-style-type: none"> • Some revenue and profit projections • Resources • Timelines/Milestones • BHAG revenue target still not fully realizable - Target group now have better appreciation of BHAG revenue target and the need for innovation led growth - DT practices; collaboration and prototyping - BSC ideas used <ul style="list-style-type: none"> • case for change (Kaplan & Norton, 2008) • SFO principles 1.1, 1.2, 1.3, 2.4, 2.5, 3.2 (Kaplan & Norton, 2000) - At this stage of the project the ideas from the BSC framework and DT practices were used separately. The integrated BSC-DT model or framework and the customer showcase events were only vague concepts that would be developed further during the AR process. - I realized that when more detailed, although simple, project plans are produced and consolidated, strategy implementation begins to take real shape. There are now deliverables and timelines that can be tracked. - I now have a much better understanding of DT from practice and further readings. - I noted that after 2 cycles, the strategic change agenda was still at the development stage but strategic planning and DT practices are being implemented. Participants in the two workshops are now practically aware of some of the BSC and DT terminologies and practices. Practical learning by doing has taken place. - With simple project plans for some new business prototypes and some new product prototypes, The Firm's strategy has now taken a practical shape and course.
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Table 4.3

Summary Documentation of Cycle 3

Stage	Cycle 3: Customer Feedback on Prototypes March 2011
Diagnosis	<p>The outcomes you hope to achieve in this next cycle, and why you think they are worth pursuing?</p> <ul style="list-style-type: none"> - After Cycle 2, core team followed up on the prototype deliverables. <ul style="list-style-type: none"> • Corporate shirt implemented • e-commerce portal and first e-book launched • Apple iPhone version of e-book prototype ready • Some Google Android application prototypes - Need to do the brave thing and get customer feedback. Thus a customer showcase event was planned. <ul style="list-style-type: none"> • Not yet customer co-creation (Ramaswamy & Guillard, 2010) • Show customers outcome of new innovation agenda • Get customer feedback and perhaps sales leads • Identify which solutions/products customers are interested in - Announce staff voting results on the solutions and products showcased <ul style="list-style-type: none"> • Award and encourage doers <p>Affirm innovation agenda</p>

Table 4.3 (Continued)

Action planning	<p>The contribution you expect those outcomes to make to your long-term goals, and why you expect it?</p> <ul style="list-style-type: none"> - Further enhance innovation culture and capability • Booth setup • Brochures • Promotional clips and slides - Prototyping; Test with real customer feedback - Awards to enhance pride among individuals and project teams - Innovation agenda is real • Workshops led to prototypes • Some ideas actually implemented • e-book already revenue generating - e-book and mobile applications are now potential B2C 'white space' solutions/products
	<p>The actions you plan to take to achieve those outcomes and why you think those actions will achieve those outcomes in that situation?</p> <ul style="list-style-type: none"> - Customer showcase event as a simple form of customer co-creation DT practice - Feedback - Sales and lead generation - Award event • Enhance culture • Encourage innovative individuals and project teams • Feedback from staff through voting - Proof that strategy is being implemented since real things are happening from Cycles 1 and 2
Action	<p>What actions you carried out, and what outcomes you achieved?</p> <ul style="list-style-type: none"> - Half day customer showcase event followed by awards event - Feedback from customers and staff. Customers and staff are now aware of our new solutions/products - Prioritize prototypes based on feedback following the convergence concept in DT
Evaluation	<p>How and why these differed (if they did) from what you expected?</p> <ul style="list-style-type: none"> - Participation from customers and staff exceeded expectations. Great excitement. - Creativity in event management - Enhance innovation culture - Enhance practical understanding of prototyping and customer engagement in solution/product development - Best of all, some sales were generated. Some customers voted with their wallets.

Table 4.3 (Continued)

Specifying learning	<p>What you learned about the client system, your methodology, yourself and so on?</p> <ul style="list-style-type: none"> - Feedback from customers and staff has great benefits. Must be brave and open to solicit feedback. Minimum element of customer co-creation. - Prototyping works. It quickly turns ideas into tangible solutions/products that can generate feedback. - Strategy is really about doing and action. Tangible outcomes from strategy and planning workshops (Cycles 1 and 2) make people believe that the strategy is being implemented. Basic problem in strategy is in implementation (Kaplan & Norton, 1996) - Decided to pursue 'white space' or 'revolutionary' B2C business as the main innovation-led growth strategy • e-books • mobile applications • already revenue generating • worldwide customers/consumers • new skills required like promotions, Facebook marketing, 'Apple economics' - I noted that the DT practices are actually working. How to tie DT formally with BSC? Through • Strategy map SFO 2.1? • Human Capital readiness framework SFO 4.4? • Organizational Capital readiness framework? • Learning and Growth perspective? - I also noted that strategy development and implementation by prototyping gives real tangible results since there is feedback and progress • action and outcome oriented • fast • staff engaged in strategy by doing • use existing capabilities in simple project management • no hard measures or KPIs involved - I coined the simple term 'Strategy by Prototyping' by linking strategy to 2 DT practices of prototyping and iteration. What needs to be really monitored is the progress of the prototypes, not hard numerical measures or KPIs as stressed by Kaplan & Norton, for instance. - I noted that DT practices like prototyping, visualization, collaboration and customer engagement helped increase the innovation capability. Relationship of design and innovation validated by Borga de Mozota, Verganti, Liedtka & Ogilvie, Brown and Martin among others as per Chapter Two.
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Table 4.4
Summary Documentation of Cycle 4

Stage	Cycle 4: DT Visualization and Modelling Workshops May 2012
Diagnosis	<p>The outcomes you hope to achieve in this next cycle, and why you think they are worth pursuing?</p> <ul style="list-style-type: none"> - After 3 major AR cycles, the strategic change agenda organizational structure emerged somewhat naturally. • Core team (Myself, COO and 2 selected DT champions from management and senior staff) • Project team members involved in developing the ideas into prototypes and actual solutions/products - Core team decided to do what the company had done best; continue learning by doing on our own with freely available guidelines from books, Internet etc. • Used a toolkit from IDEO (http://www.ideo.com/work/toolkit-for-educators) to formally train the team members on visualization and modelling techniques - Need to continue momentum of innovation agenda despite the success of Cycle 3 and formally introduce DT concepts and tools - Need to enhance innovation capability through formal training
Action planning	<p>The contribution you expect those outcomes to make to your long-term goals, and why you expect it?</p> <ul style="list-style-type: none"> - Enhance DT visualization skills - Enhance innovation culture and capability - Candidly show company must be open to new management ideas/practices/techniques as per the mission statement to “be a model company that successfully blends modern management practice with traditional moral and ethical values” - Learn by experience how simple tools like colour paper, tape, staples and Post-It notes can model strategy and project ideas related to ICT.
	<p>The actions you plan to take to achieve those outcomes and why you think those actions will achieve those outcomes in that situation?</p> <ul style="list-style-type: none"> - Practical workshop using collaborative techniques and simple tools. - Repeat same workshop using slightly expensive LEGO tools (www.lego.com) • This was in a sense accidental when I received an e-mail marketing a workshop on planning using LEGO building blocks. LEGO for strategic planning sounded intriguing and the core team decided to try. Surely it is new and perhaps fun. - Encourage and practically learn strategic planning and prototyping with simple tools. LEGO was simple but more costly. - Enhance one of The Firm’s values, Learning, and preferably learning by doing.

Table 4.4 (Continued)

Action	<p>What actions you carried out, and what outcomes you achieved?</p> <ul style="list-style-type: none"> - 2 one-day workshops on modelling and visualization using simple tools. - 2 one-day workshops on modelling and visualization using LEGO. - Same participants of managers and product team members - Simple tools work to quickly prototype solution/product concepts. Easier to complement models with video or audio comments rather than written documentation. - DT visualization and modelling using simple tools proved to be a new and exciting way to plan and build ideas into models and prototypes. <ul style="list-style-type: none"> • Encourage ownership • Enhance teamwork and collaboration <p>Cheap, simple and innovative</p>
Evaluation	<p>How and why these differed (if they did) from what you expected?</p> <ul style="list-style-type: none"> - Support from the participants was excellent throughout this cycle. - DT visualization and modelling with simple tools enhances teamwork and collaboration, also an important DT practice. - Easy to build quick product prototypes and models. See Appendix A.3.9. - Solution and conceptual prototypes must be accompanied with recorded verbal explanations - Easy to practice
Specifying learning	<p>What you learned about the client system, your methodology, yourself and so on?</p> <ul style="list-style-type: none"> - Clearly DT practices have quickly and in a simple manner enhanced the innovation efforts, culture and capability in the company. - As per AR Cycle 4, the project has gone through <ul style="list-style-type: none"> • 2D visualization, sketches and drawings • Prototyping • Customer engagement • Divergence and convergence cycles until we prioritized the solutions/products • 3D visualization and modelling - I pondered on how to integrate DT with strategy frameworks like the BSC (Kaplan & Norton, 1996) and core competencies (Hamel & Prahalad, 1996). I had by that time (Q1 2012) formally enrolled in the PhD program. While doing the literature review on broad topics like business strategy, BSC, DT and AR, I noticed some parallels in 'Strategy by Prototyping' as noted in Cycle 3 with 'Strategy by Simple Rules' (Eisenhardt & Sull, 2001). Also article by (Field, 2011) gave me the courage to be creative in adapting the ideas behind the conventional strategy map. - Most importantly, I noted that this new strategic change agenda is being implemented with tangible outcomes without the need of KPIs, measures and formal review meetings as promoted by Kaplan & Norton (2008) for successful strategy implementation. - Staff got involved with strategy development and implementation by practically doing and translating ideas into prototypes. This results in action and outcomes. - At this stage I decided to formulate an improved thematic concern and research question for the AR thesis. <ul style="list-style-type: none"> • Simpler and more action-oriented approach for strategy development and implementation for SMEs • Integrate lessons learned from DT and BSC

The above tables provide qualitative notes and learning that when compared to the literature, as referenced in some of the table entries, gave confidence to the researcher that the learning from the action while solving the research problem opens up questions that may not be addressed from existing literature. After considering various options as mentioned in the ‘Specifying Learning’ phase of Cycle 3 and Cycle 4, the researcher narrowed down the new knowledge contribution to formulating a ‘simpler and more action-oriented approach for strategy development and implementation for SMEs’ that ‘integrate lessons learned from DT and BSC’.

Section 3.3 discussed some numerical measures to evaluate success in solving the research problem. The results from the quantitative data collected are presented in the next session.

4.2 Results Summary from Cycles 1 Through 4

The original practical problem was to address the strategic change agenda of ‘new growth by increasing the innovation capability of The Firm through the use of DT’. Appendix A.4.1 discusses the overall financial performance of The Firm over the planning period. This research is not about performance management or the full strategy implementation of The Firm and as such the data is selected to only indicate the overall success of the strategy, as discussed in Section 3.3. Figure 4.1 clearly confirms that The Firm greatly improved its financial performance and has successfully implemented its strategy.

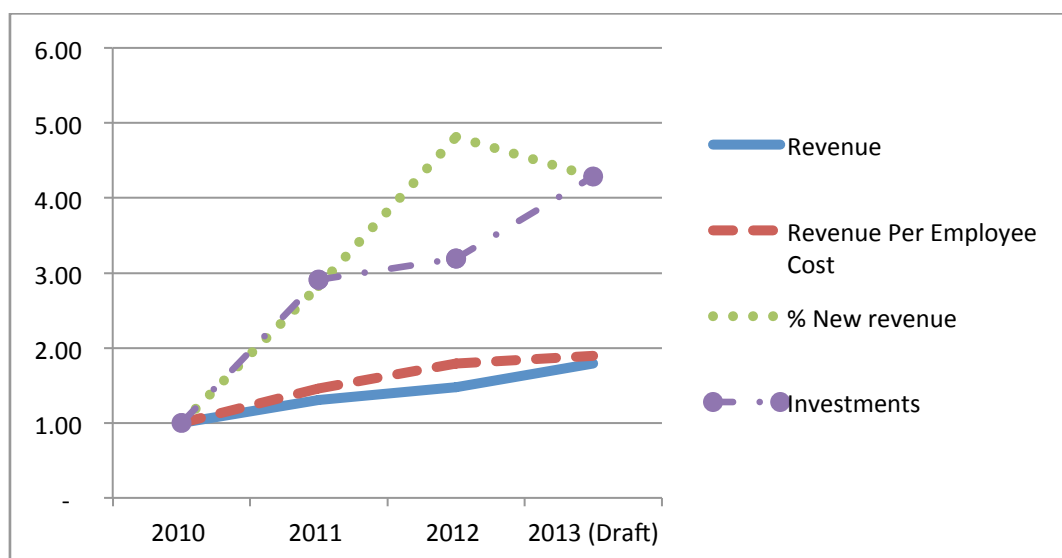


Figure 4.1
Growth in Selected Financial Outcome Measures

Peter Drucker's definition of innovation is mentioned in Section 2.3.2, "Innovation is the effort to create purposeful focused change in an enterprise's economic or social potential." It strongly emphasizes that innovation by itself cannot be the objective, it must relate to an improvement in the organization. The chart in Figure 4.1 clearly confirms that The Firm greatly improved its financial performance and has successfully implemented its strategy.

4.2.1 Detailed Results on the E-Book 'White Space' Prototype

The e-book business is one of the 'white space' growth projects that started as a strategic business idea and finally became a real business unit, generating revenue after several prototyping cycles. There are two versions of the e-book titles, a PDF reader version (www.adobe.com/products/reader.html) and a customized Apple iOS version for the Apple iPhone and iPad range of products. Only the results related to the Apple iOS applications will be presented and discussed for the following reasons:

- i. Applications to be sold on the Apple iTunes App Store (<https://itunes.apple.com/us/genre/ios/id36?mt=8>) must meet technical, ethical and other standards set by Apple. This forces The Firm to upgrade its technical and ethical capabilities to meet global standards. It really became a practical test whether The Firm can even participate in the growing Apple economy (London, 2012).
- ii. Apple is recognized as one of the most innovative companies in the world (Fast Company, 2011, 2012). The Firm knew it would learn something about innovation through this engagement.
- iii. The Firm has never participated in the mobile applications business before and this attempt to sell applications through the emerging mobile commerce is a true 'white space' innovation business for The Firm. In fact, one of the change agendas as shown in Figure 4.16 is for The Firm to enter the B2C domain. Thus this strategic idea is the best proxy of The Firm's planned increase in its innovation capability being applied to innovating a business model.
- iv. It gives the chance for The Firm to really learn many new things from product development, meeting the requirements by Apple, marketing in the Apple economy, Facebook social media and others.

Table 4.5 summarizes the major activity timelines of the Apple iOS applications business. The product development cycles mirrored the AR cycles and adopted many DT practices particularly prototyping and learning launch (Liedtka & Ogilvie, 2011). Since new product development (NPD) is not a subject matter of this thesis, the researcher will not provide the lessons learned from the use of DT in NPD here. However, the researcher would like to point out some lessons learned from the summary information in Table 4.1 since ‘increasing the export component of The Firm by tapping into the growing global mobile commerce’ is one of the ‘three elements in the strategy that is of importance to SMEs in general and Malaysian SMEs in particular’, as mentioned in Section 1.4.

- i. The project team consisted of a content manager, iOS programmer and graphics designer with only the iOS programmer working on a full-time basis.
- ii. Four main applications code-named M&WE, HQR, SOP, BHMC are related to the mobile e-books and promoted in The Firm’s marketing efforts. SOP had three parts or volumes because of the file size of the final application.
- iii. The Radio Stations are free and fun applications. In the context of DT they allow The Firm to prototype and launch new technical features through these free apps and then incorporate the features in the paid apps. Also the free apps generate advertising revenue, although small, and allow advertising for the paid apps.
- iv. Since The Firm started on the Apple apps ‘white space’ strategy, it has received approval from Apple for 12 different applications.

As mentioned in Section 2.3.10, the glaring element that is missing in DT is cost. Continuing the prototyping cycles obviously involve time, material and costs. SMEs can ill afford to continue prototyping and must develop some evaluation criteria to continue or stop with the product development. The criteria can be a combination of quantitative outcomes or qualitative benefits that need to be determined at some point in time, preferably at an early stage of the prototyping process. These criteria will be quite specific to the nature of the SME business, appetite for failure, nature of the product and service developed and others. Daniel and Wilson (2004) proposed some criteria related to e-commerce projects for

turbulent industries. The Firm used simple quantitative outcomes like the revenue generated from the paid apps and the number of downloads of the free and paid apps.

Figure 4.2 and Figure 4.3 summarize the number of downloads of the three main apps mentioned in Table 4.1 and the most popular radio station app (BHMC was launched only in May 2013).

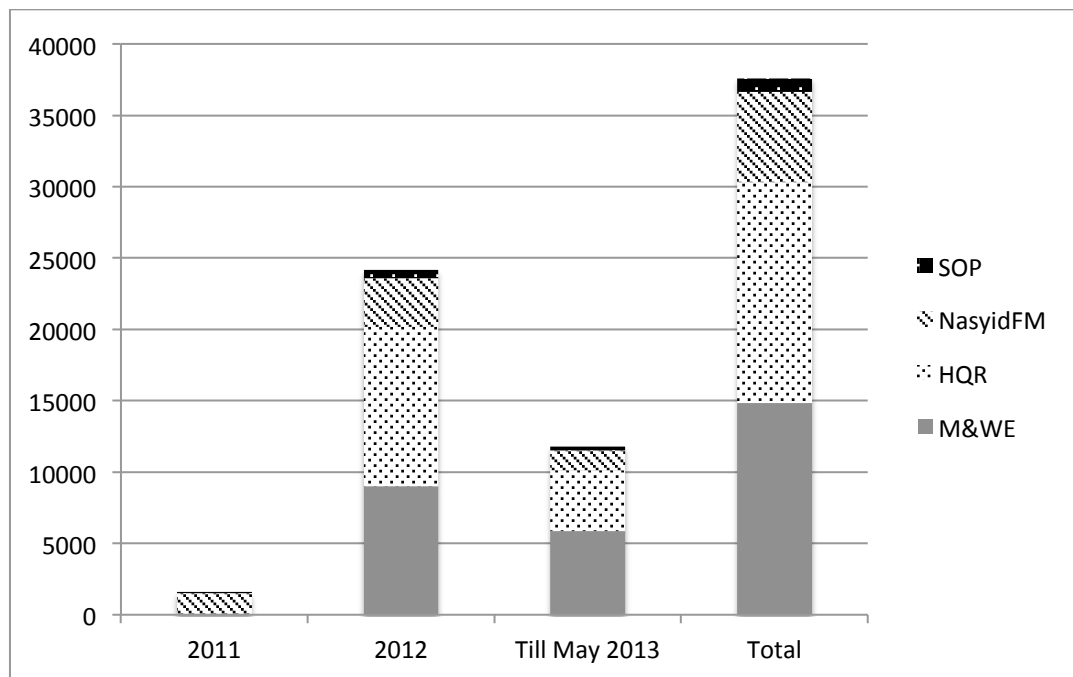


Figure 4.2

Yearly Summary of Total Number of Downloads per App

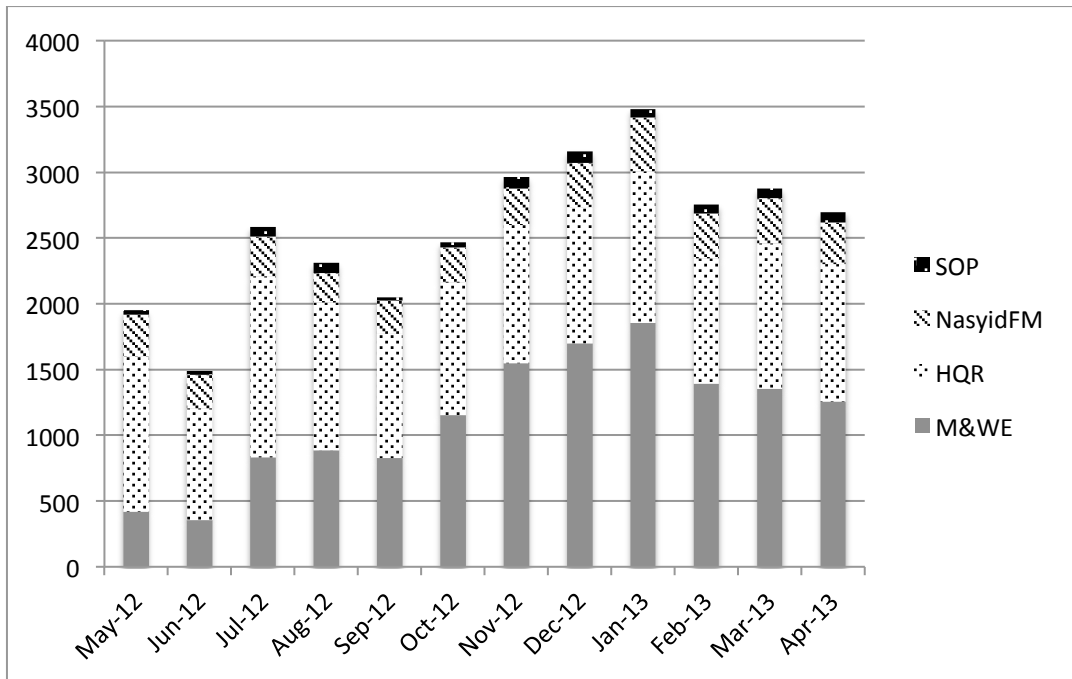


Figure 4.3
Most Recent Monthly Summary of the Total Number of Downloads

Figure 4.4 and Figure 4.5 show the percentage downloads based on the top 10 countries for the years 2011 and 2012 respectively. There were downloads from 56 different countries in 2011 and 124 different countries in 2012. The charts truly show the global nature of the business and with an interesting trend that the percentage contribution from Malaysia is becoming smaller.

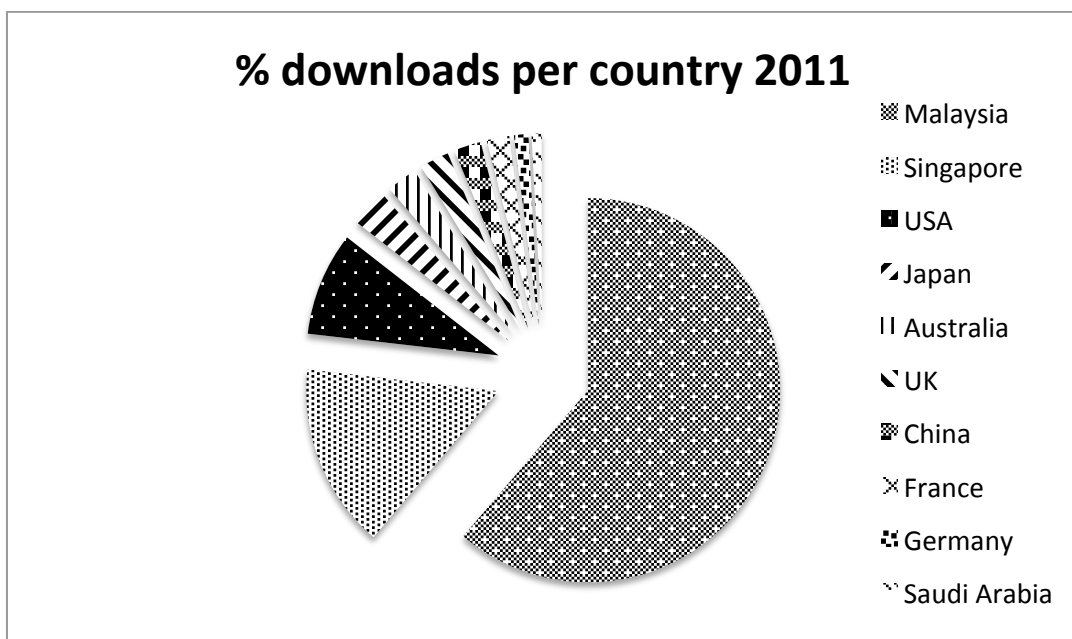


Figure 4.4
Percent Downloads of Apps per Country 2011

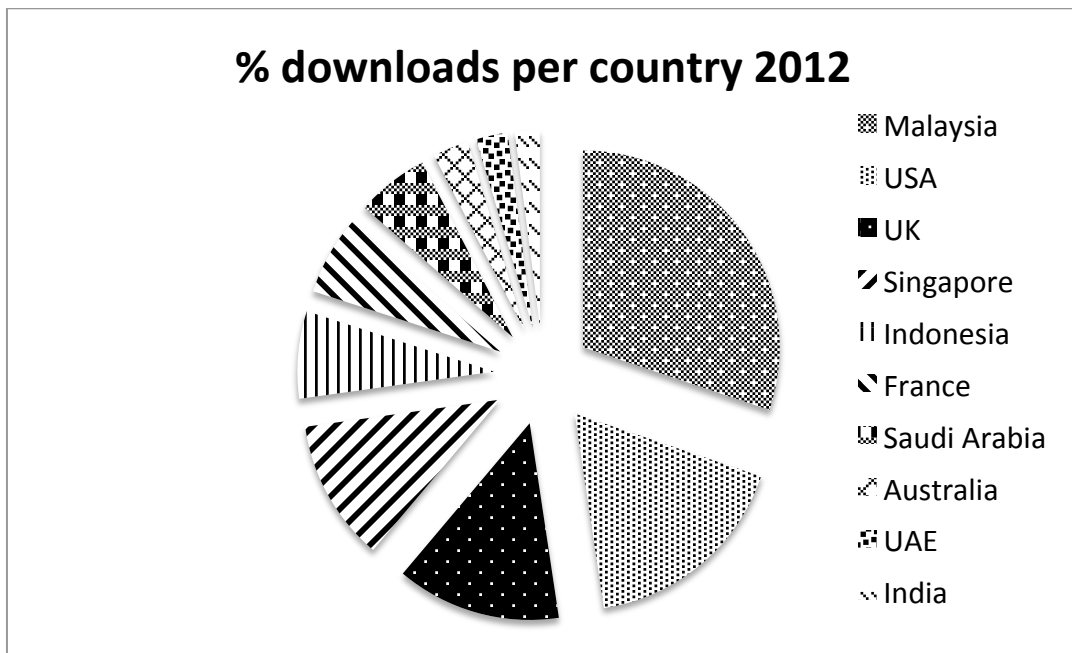


Figure 4.5
Percent Downloads of Apps per Country 2012

Any consumer-based business today must take advantage of social media. As shown in Table 4.1, one of the features of the Apple apps is integration with Facebook. The Firm created a Facebook page as a marketing tool and to actively engage with the fans (<https://www.facebook.com/estore.ansi>). Facebook marketing is a new experience for The Firm and it still has much more to learn from this social media tool. Figure 4.6 shows the growth trend of the Facebook fans per country for the months of August 2012 through April 2013 for the top seven countries.

Clearly The Firm has successfully used DT to implement its strategic change agenda and addressed the research problem, ‘new growth by increasing the innovation capability of The Firm through the use of DT’, through the Apple e-book apps business. Before AR Cycle 1 The Firm had zero presence in the e-book business or even the Apple iTunes market place. Now The Firm generates daily revenue from a global mobile consumer market for which the monthly figures shown in Figure 4.3 indicate a stable and consistent trend. The Firm had never experienced daily sales before 2011 but now it has an increasing worldwide customer base as shown in Figures 4.4, 4.5 and 4.6. The Apple e-book apps is now an on-going business segment for The Firm.

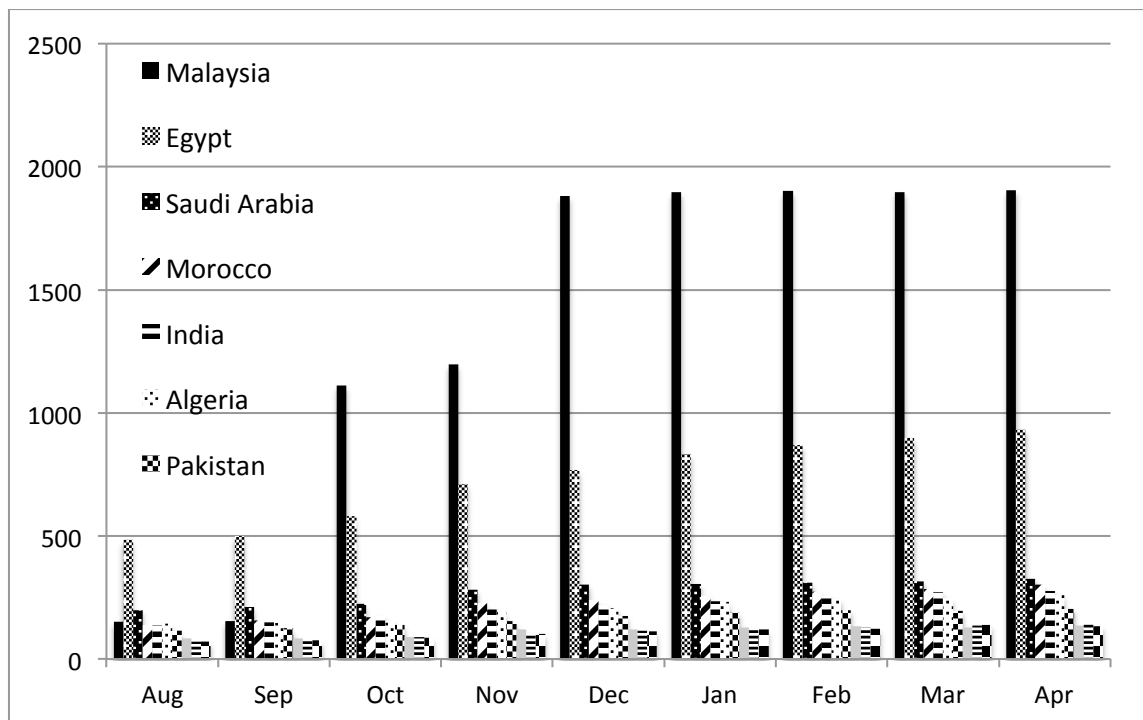


Figure 4.6
Facebook Fans From Top 7 Countries (Aug 2012 - Apr 2013)

Prior to AR Cycle 1 The Firm never had any experience with social media but now engages with its fans from different countries on a weekly basis through Facebook. The Firm is still learning social media marketing and data trending analysis to convert the Facebook ‘likes to ‘engagement’ to sales.

The contents of the various e-book titles have also increased the intellectual property (IP) intangible asset base for The Firm. In 2012, a book publisher produced printed versions of two title codes, M&WE and SOP, as indicated in Appendix A.4.2. The Firm is now monetizing this IP through royalty payments from the publishers. This was not in the original strategic plan of the Firm and it shows an additional benefit of the DT approach of implementing strategy by quickly prototyping, learning from the launch of the new products and adapting its strategy and tactics progressively. It provides dynamism to strategy implementation.

The preceding tables and figures in Section 4.1 show that one of the ‘white space’ ideas from Cycle 1 has gone through various prototyping iterations and matured into a real cash generating business for The Firm. The Firm has a product roadmap (Appendix A.4.2) and plans to expand its e-book products into new market places like Amazon and Google. In fact, in July 2013 The Firm extended its e-book business into the Amazon market place. Clearly the Firm has achieved the strategic

change agenda of ‘new growth by increasing the innovation capability of The Firm through the use of DT’ since DT practices like prototyping, learning launch and customer co-creation (Appendix A.4.3), among others, were used extensively in the new e-book Apple apps business.

The Firm successfully implemented its three year strategic plan having achieved the financial outcome measures as shown in Figure 4.1. The e-book business started as an idea from AR Cycle 1 and is now a full business function of The Firm. It is the best example of the success of the innovation agenda of the Firm, bringing the Firm into the global B2C mobile and e-commerce markets through the biggest names in these markets, Apple and Amazon. Figure 4.7 shows the achievement of The Firm’s strategic change agenda over the planning period. All the components of the strategic change agenda showed significant improvement. It includes the revenue outcome and also the improvements in DT practices, innovation capability, CMMI and other technical capabilities. Appendix A.4.1 shows the rate of improvement in selected financial measures over the planning period. It is important to note that improvements in innovation and DT practices are explicitly mentioned in the problem statement. In conclusion, the ‘**action**’ part of the AR project is successful.

Strategic Change Agenda/Outcomes Achieved		
From... (As Is)		...to (Will Be In 3 Years)
Revenue 31M	Growth	Revenue 56M
SI and VAR B2B, B2G	Business Model	<ul style="list-style-type: none"> • Increase own products/solutions/ services • Grow B2C
Technical Project Management	Capabilities	<ul style="list-style-type: none"> • Other technical • CMMI
	Innovation	More innovative, DT
	Image/Branding	<ul style="list-style-type: none"> • Oracle Premium Partner Co-Branding • Facebook
Very little	Design and product development	Own products
ICT	New Businesses	<ul style="list-style-type: none"> • Mobile commerce • Portfolio Investments
Defined	Culture and values	<ul style="list-style-type: none"> • Conscious effort to implement • More awareness programs

Figure 4.7
Change Achieved After the Planning Period (2010 - 2013)

Table 4.5
Timeline for Apple apps

Month/Activity	M&WE	HQR	SOP	BHMC	Radio Stations
Feb 2011					Dinet FM - Officially Released
Mar 2011					Huru Hara FM - Officially Released - Run on Background Display Features
Apr 2011					Frenzy FM - Officially Released)
May 2011					Oh! Media FM - Officially Released
Jun 2011					Desa FM - Officially Released Nasyid FM - Officially Released
Jul 2011					
Aug 2011					Oh! Media FM - Update Radio Server, HomePage & FB Tab Frenzy FM - ChatBox Features
Sep 2011			- SOP1 V1.0 - Officially Released - SOP1 V1.1 - Compatible with iOS 3.0 and Above		
Oct 2011			- SOP1 V1.2 - New Graphic - SOP2 V1.0 - Officially Released		
Nov 2011					

Table 4.5 (Continued)

Dec 2011			- SOP1 V1.3 - Share - Email Function - SOP2 V1.1 - Share - Email Function - SOP3 V1.0 - Officially Released) - SOP3 V1.1 - Share - Email Function)
Jan 2012			
Feb 2012			
Mar 2012	V1.0 - Officially Released	V1.0 - Officially Released	
Apr 2012	V1.1 - Share Email with Links & Share - FB Function		- SOP1 V1.4 - Share - FB Function - SOP2 V1.2 - Share - FB Function - SOP3 V1.2 - Share - FB Function
May 2012			
Jun 2012			- SOP1 V1.5 - iPad Version Released - SOP2 V1.3 - iPad Version Released) - SOP3 V1.3 - iPad Version Released
Jul 2012	V1.2 - iPad Version Released		
Aug 2012	V1.3 - Slider & Time Duration Features		- SOP1 V1.6 - Slider & Time Duration - SOP2 V1.4 - Slider & Time Duration - SOP3 V1.4 - Slider & Time Duration
Sep 2012			

Table 4.5 (Continued)

Oct 2012		- SOP1 V1.7 - Latest Content, New Layout & Compatible with iOS6	
Nov 2012		- SOP2 V1.5 - Latest Content, New Layout & Compatible with iOS6	
Dec 2012		- SOP1 V1.8 -Integrate 7 Audio Lectures by Dr. Tareq Al-Suwaidan himself	
Apr 2013		- V1.1 - Update Radio & Twitter Link	
May 2013	V1.4 - Compatible with iOS 6.1 & 4 Inch Retina Optimization	- V1.2 - Compatible with iOS 6.1 & 4 Inch Retina Optimization	- V1.0- Officially Released - V1.1 - Compatible with iOS 6.1, 4 Inch Retina Optimization & Smaller File Size

4.3 Addressing the Research Question in Cycle 5

In the learning evaluation portion of Cycle 4, the researcher phrased the research question with two broad components that have the potential to contribute to new knowledge in the broad field of strategy management.

- i. Simpler and more action-oriented approach for strategy development and implementation for SMEs
- ii. Generalize and document lessons learned from integrating DT with BSC.

As mentioned in Chapter Three, AR is about **learning by doing** and that along the way the knowledge component for a PhD thesis will emerge. The AR project after Cycle 4 will be more focused on developing and documenting the new knowledge around the research question with these two broad components as summarized in Figure 3.2. It will concentrate on the ‘**research**’ part of the AR project (Dick, 2000).

4.3.1 Cycle 5 Summary Table

Cycle 5 covers the first development and practical use of a simplified framework for strategy management for small organizations. It is the first AR cycle to address the research question. Table 4.6 summarizes the observations related to Cycle 5.

The case organization, SBF, is a new not-for-profit organization set up to organize humanitarian and political support for the change effort in Syria from among the expatriate global Syrian business community. This effort is supported by one of the Gulf countries as the ‘host’ nation. Syria is experiencing a major political turbulence that has escalated into a civil war resulting in daily civilian deaths. The dynamics of humanitarian and political support change almost daily. Obviously any strategic plan for SBF must be simple, practical and action-oriented while addressing the longer-term mission. One of the executive directors of SBF has vast experiences in strategic planning and had worked with the researcher in various BSC related projects when he was a strategic planning manager in two different large companies in the Arabian Gulf area. When he invited the researcher to help him develop the strategic plan for SBF in July 2012, he expressed the desire to use the BSC methodology. This gave the researcher the perfect opportunity to test out some of the learning points briefly mentioned in Table 4.3 and Table 4.4 and further articulated in Section 2.2.4 and Section 2.2.6.

Table 4.6
Summary Documentation of Cycle 5

Stage	Cycle 5: SBF Consulting Project (July 2012)
Diagnosis	<p>The outcomes you hope to achieve in this next cycle, and why you think they are worth pursuing?</p> <ul style="list-style-type: none"> - Test new revised Strategy Map and Strategic Plan template for a new customer. Although I have seen some of these ideas work in The Firm, it is always better to test it with real customers as the learning from Cycle 2 indicates. - Implement some of the lessons observed in Cycles 3 and 4 in an actual consulting project - Get feedback from the customer who, like me, is also a Palladium Kaplan-Norton Balanced Scorecard Certified Graduate, and has years of practical experience in BSC and Strategic Planning. Thus feedback from a knowledgeable and experienced BSC practitioner.
Action planning	<p>The contribution you expect those outcomes to make to your long-term goals, and why you expect it?</p> <ul style="list-style-type: none"> - Address one component of the research question on a simpler model for strategy management for SMEs - Customer organization (SBF) is a small non-profit start up that is heavily dependent on action. It is addressing the humanitarian and political needs for Syria, a country in deep political turmoil. It is an ideal organization that wants a strategic plan that is immediately actionable. - First formal step in documenting a new simpler, more actionable approach to strategy. - Working together with and getting feedback from an experienced and competent BSC practitioner is valuable to validate the ideas and approach. <hr/> <p>The actions you plan to take to achieve those outcomes and why you think those actions will achieve those outcomes in that situation?</p> <ul style="list-style-type: none"> - Develop and document model - Use model for a real case apart from The Firm. - Collaborate with Director of SBF (who himself is a strategic planner) to discuss and implement practical strategic planning ideas and approaches for SBF. - SBF, as the case organization, needs a practical and actionable strategic plan document. - Actual real project with payment as proof of acceptance.
Action	<p>What actions you carried out, and what outcomes you achieved?</p> <ul style="list-style-type: none"> - Completed full working strategic plan report as project deliverable. - Many of the initiatives actually acted upon. - Base model to improve upon.
Evaluation	<p>How and why these differed (if they did) from what you expected?</p> <ul style="list-style-type: none"> - Practical and actionable approach to strategy with a focus on actual initiatives while maintaining some important longer term elements like the mission statement (Collins & Porras, 1994; Kaplan & Norton, 2004) - Maintain the essence of the BSC concept of balance between outcomes and drivers, results and actions, 'what to achieve' and 'what to do'. (See discussion in Section 2.2.6) - Maintain the visual aspect of the strategy map but avoided difficult to proof concepts like cause-effect relationships and stringent constructs like the four perspectives. Work by (Field, 2011) as shown in Figure 4.10 was most helpful. - Doing away with measures while highlighting the role of initiatives or projects. More specific than short objective phrases. (See discussion in Section 2.2.4) - Simple project plan templates can be more elaborate but not a key aspect of the model. - No new skills required implementing strategy like having measure experts etc. Simple project planning and execution skills and focus.

Table 4.6 (Continued)

Specifying learning	<p>What you learned about the client system, your methodology, yourself and so on?</p> <ul style="list-style-type: none"> - Approach accepted by customer. Agreed on it being simpler and more action oriented. - Classic Strategy Map template (Kaplan & Norton, 2004) rigid especially on the structure and the 4 perspectives (See discussion below) - Retain core ideas like importance of strategy, balance, longer-term factors like mission statement. - Broadened the capabilities from (Field, 2011) to Strategic Enablers (perhaps easier than Learning and Growth) - Initiatives show a focus on being practical and action oriented and is treated as the core substance of strategy. Clearly similar organizations may have similar strategic objectives like 'increase customer satisfaction' but will implement different initiatives/[programs/projects. This ensures the new one page strategy visual is unique to each customer. (See discussion below) - So far addressed the first component of the research question but not yet DT-BSC integration. Plan to complete in next AR cycle. - Co-creating the model through active customer input validates the learning (also part of DT practice).
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Only the model developed and used for this case consulting technical AR project will be discussed here. The diagrams and information that are relevant to the discussion on developing a simplified framework for strategy management for small organizations are presented with slight modifications to protect some information that may be sensitive.

4.3.2 Developing the Model Used in Cycle 5

1. The classical BSC strategy map model and components as summarized in Figure 4.8 was used as a start. Section 2.2 positions the BSC as a relevant and most common framework for strategy implementation and business performance management. It is well documented and is among the top ten globally used management tool. **Thus the new model being developed is not starting from scratch but from a best practice framework.**
2. Section 2.2.3 and Section 2.2.4 discuss some criticisms against the BSC. Some of the criticisms that apply to SBF and to SMEs in general include
 - i. static nature of BSC.
 - ii. rigid and limiting structure of the BSC strategy map template with the four perspectives and cause-effect relationships.
 - iii. time required to develop and then implement the BSC thus making strategy not immediately actionable.

- iv. costs involved since it usually requires BSC experts and many follow up meetings to determine the measures and targets. SMEs have limited human and capital resources.
 - v. new skills involved like managing the measures.
 - vi. general problem with getting good measures and the data to support those measures.
3. The first simplification made was to emphasize the focus on ‘initiatives’ instead of the focus on measures as in the original BSC model. As shown in Figure 4.8, initiatives are related to the measures and targets that are in turn related to the specific strategic objectives. In reality, some initiatives may be also related to other objectives. There must be a causal relationship between the objectives and initiatives in the sense that the initiatives must have impact on the strategic objectives. Figure 4.9 shows a simple example of mapping the initiatives (programs or projects) in an organization to its strategic objectives. Example ‘Initiative C’ and ‘Initiative K’ are deemed, after some criteria, as not having any impact on any of the strategic objectives. Thus the organization can stop or put a lower priority on these two initiatives. Also the example ‘Objective I2’ has no related initiative. This means that that objective will not be achieved and the organization needs to plan for a related initiative or drop it from the strategic objectives list.
4. The arrow at the bottom of Figure 4.8 proposes a vital observation the researcher has noted after many years of experience in implementing the BSC. Measures describe the objectives quantitatively but strategic initiatives are the real drivers of action that help realize the objectives. One **practically manages strategy by managing initiatives**. Measures allow for quantitative monitoring on the progress of implementing strategy. This can also be done qualitatively by monitoring the progress of the implementation of initiatives. Obviously, delays and problems in implementing a strategic initiative will have negative consequences in realizing the related strategic objectives. One can implement strategy without needing measures and by just monitoring the implementation of strategic initiatives. This was also noted this in the learning stage of Cycle 2 and Cycle 3. This will greatly simplify strategy implementation and make strategy actionable since initiatives are tangible programs and projects. It also reduces the time, resources and costs involved

in strategy implementation since developing measures and actually producing the quantitative reports do take significant effort. There are other criticisms related to measures that were discussed in Section 2.2.6. One of the questions to be addressed in this research is to overcome some known difficulties in managing strategy for SMEs. This observation that managing strategy is essentially managing action programs and projects forms a significant conceptual contribution to the proposed model. With the focus on initiatives rather than measures, the monitoring of the strategy is more qualitative rather than quantitative since it actually involves monitoring the implementation of action programs and projects like project milestones and deliverables.

5. The next step was to simplify the rigid structure of the classical strategy map that represents a one-page visual of summary strategic objective phrases linked together across the four standard BSC perspectives. Obviously the one-page summary tries to simplify the description of strategy and must be retained. The visual nature of the strategy map also has benefits and is consistent with the core DT practice of visualization and must also be retained. Section 2.2.6 discusses the evolution and adaptation of the BSC. Figure 4.10 shows a strategy map of a case study reported recently in a publication edited by the BSC creators (Field, 2011). It seems to tacitly approve an unconventional strategy map that eliminated the four conventional perspectives and instead “weaving them in their own way into the strategy map” (Field, 2011, p. 7). Earlier, Lawrie and Cobbold (2004) used only two ‘activity’ and ‘outcome’ perspectives instead of the traditional four perspectives. Thus the number and category of perspectives and also the components of the strategy map are adaptable within the BSC framework. It is paramount to retain the strategy in the strategy map visual since it is intended to describe what is strategic to the organization. The concept of balance must also be retained but can be simplified to indicate just the balance between outcomes and drivers or between results and actions or between ‘what to achieve’ and ‘what to do’. This adaptation also allows components and ideas from other management or strategy frameworks and best practices to be built into the strategy map. The example in Figure 4.10 highlights the strategic role of capabilities as discussed in the resource based view (RBV) of strategy (Section 2.1.3).

6. The example in Figure 4.10 was further adapted to

- explicitly include the core purpose or the mission statement as a best practice for building lasting organizations (Collins & Porras, 1994).
- replace the generic and conceptual objective drivers with specific actionable initiatives
- broaden the scope of capabilities to ‘Strategic Enablers’ to include other obvious strategic enablers apart from resources and capabilities. In the SBF case, the financial and logistics support from the host nation is deemed a specific strategic enabler since it is a community of Syrian expatriates.

Figure 4.11 shows the proposed strategy map that balances the longer-term mission of SBF with shorter-term strategic outcomes and actionable strategic initiatives. (The mission statement was drafted before the project).

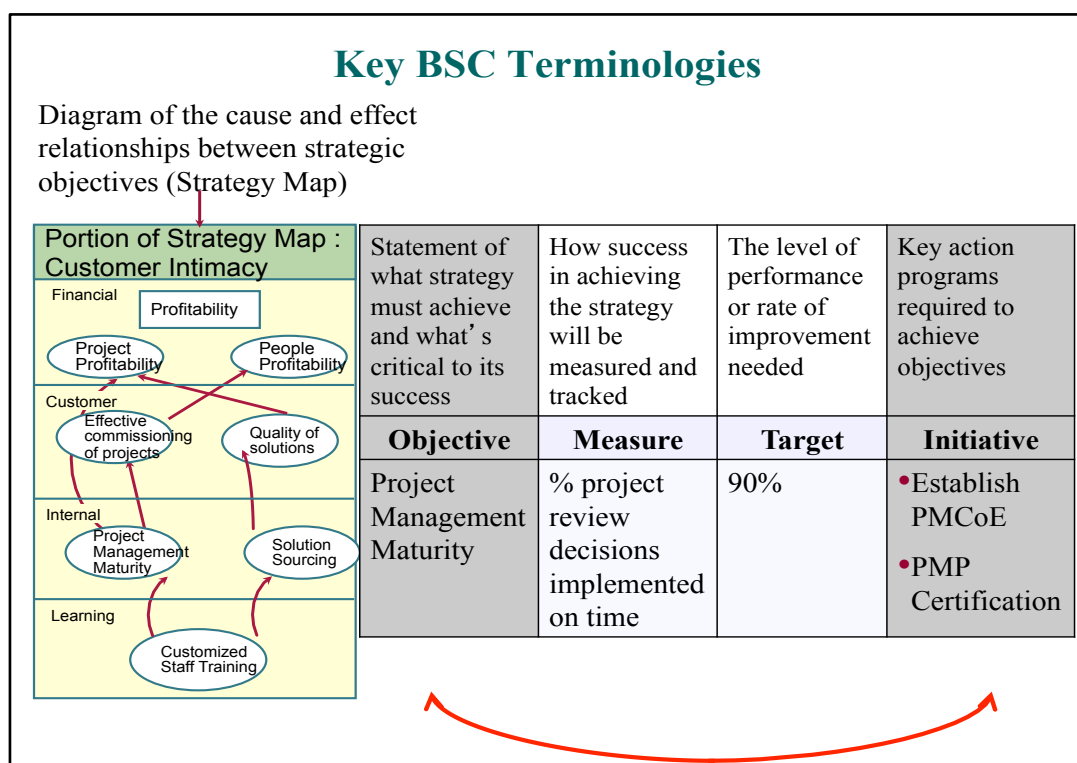


Figure 4.8

Key Components of the Classical BSC Framework

Mapping Initiatives to Strategic Objectives												
List of Initiatives												
Strategic Objectives	1	2	3	4	5	6	7	8	9	10	11	12
Project Profitability	X	X	X			X	X				X	X
People Profitability	X					X	X					
Effective commissioning of projects					X				X	X		X
Quality of solutions	X		X			X	X			X		
Project Management Maturity		X		X					X			
Solution Sourcing	X					X	X			X		
Customized Staff Training	X	X	X	X		X	X				X	

Figure 4.9
Achieving Strategic Objectives Through Actionable Initiatives

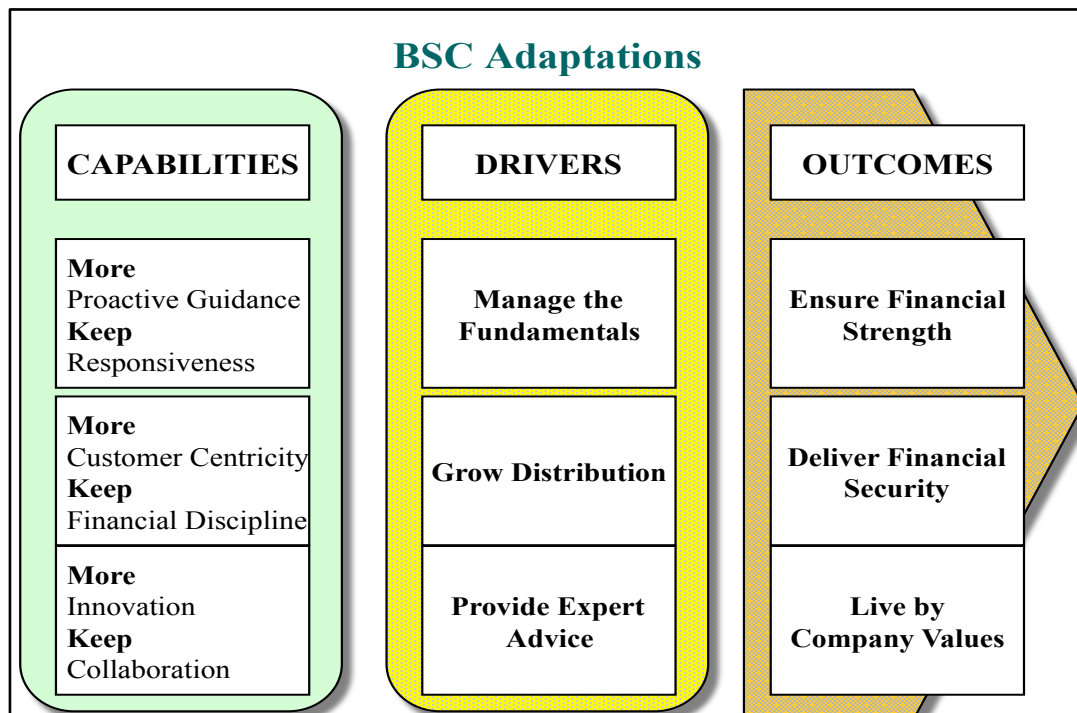


Figure 4.10
Adaptation of the Strategy Map

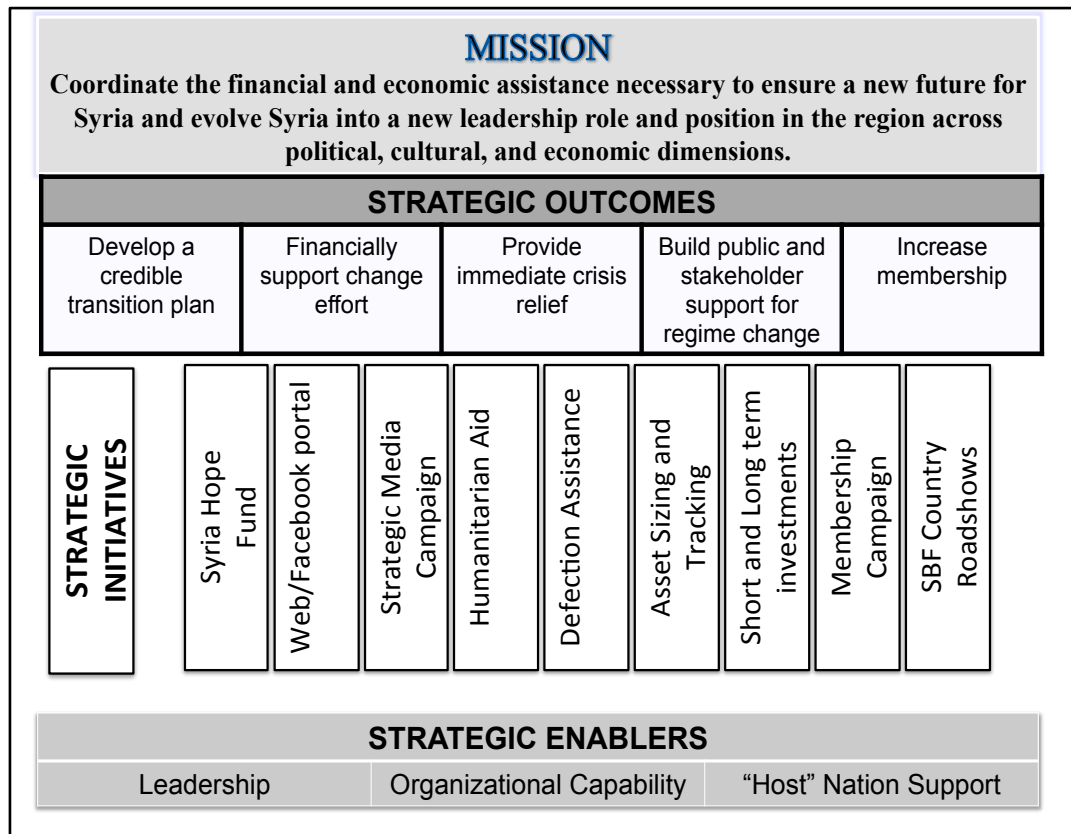


Figure 4.11
New Strategy Visual

A simple project template augments the one-page strategy visual (Figure 4.11). Figure 4.12 shows a simple project template that obviously can be expanded to include other components of a project. This is repeated for each of the identified initiatives showing other detailed deliverables and milestones. Figure 4.13 is a simple template to track and monitor all the initiatives together.

The whole exercise was completed within one week that involved daily discussions with the Director of SBF and a presentation session with the Chairman of SBF. Thus a simple, complete, actionable, strategic plan that incorporates best practices in strategy like the BSC, RBV, core purpose (Collins & Porras, 1994), program and project management, can be completed and documented within a much shorter time compared to the typical BSC process (15 to 26 weeks) (Bourne *et al.*, 2000). The project templates require simple project management knowledge and skills. These skills are quite easy to develop even in SMEs. Thus the strategic plan becomes immediately actionable.

Based on this model, only the visualization practice of DT is used. The adaptability of the model can perhaps incorporate other DT practices as discussed in Section 2.3.5.

Strategic Initiative

Project/Task	% Completion	Due Date
Web Portal	80%	
• Arabic version		
• English Version		
• Integration with social media tools Facebook, Twitter, LinkedIn		
• Integration with GetResponse for e-mail marketing		
• On-line membership application and approval		
• On-line suggestion and feedback system		
• Hire Web/Social Network master with networking and computer related trouble shooting skills		
• Soft launch of Web portal		01 Aug
• Official launch of Web portal together with soft launch of SBF		12 Aug

Notes :

1. Web and Social Media will be updated daily to gain support for events that happen on the ground.

Figure 4.12

Project Template for One of the Selected Initiatives

Strategic Initiatives Summary

Initiative	Project Manager	% Complete	Due Date	Budget 2012 (USD)
SBF Office Opening	Admin Manager	20%	End Oct	10,000
Hiring Key Personnel	Admin Manager	20%	End Aug	700,000
Accounting System	Accountant		End Sep	10,000
Leadership and Management Planning and Team Building Workshop	CEO		14-15 Sep	20,000
Guidelines and Processes of Engagement with Host Nation	CEO		End Jul	
Web Portal	Media Manager	80%	End Jul	30,000
Strategic Media Campaign	Media Manager	Approve Plan and Budget by end Aug		
SBF Country Roadshows	CEO	Approve Plan and Budget by end Aug		
Membership Drive	Membership Manager	On going		
Humanitarian Aid	TBD	On going		
Defection Fund	TBD	On going		
Investments	Business Manager	Approve Plan and Budget by end Aug		

Figure 4.13

Template to Monitor the Portfolio of Strategic Initiatives

4.4 Completing the Research Question in Cycle 6

The salient points from the initial model that was developed to address the first component of the research question are noted in the ‘Specifying Learning’ stage of Cycle 5. More work is required to complete documenting the DT-BSC integration process. This is the focus of Cycle 6 which mainly reflects on the lessons learned throughout Cycles 1 to 5 and compares notes with the related academic literature to propose and articulate new knowledge that will qualify this AR project as a PhD thesis. As Figure 3.2 shows, this cycle also involves writing parts of the thesis.

4.4.1 Cycle 6 Summary Table

Although there are no formal participants in this AR cycle and the researcher solely did the work, the same AR documentation model will be used for consistency. Cycle 6 covers the first full documentation of the DT-BSC strategy process framework. Writing the formal literature review helps in the theoretical input for the framework and also to scope the important features that the framework needed to address. Thus writing the complete draft for Chapters 1, 2 and 3 of this thesis was integrated into Cycle 6. Table 4.7 summarizes the observations related to Cycle 5.

Table 4.7

Summary Documentation of Cycle 6

Cycle 6: Developing and Documenting DT-BSC Integration Process Framework (Sep 2012 to May 2013)	
Diagnosis	<p>The outcomes you hope to achieve in this next cycle, and why you think they are worth pursuing?</p> <ul style="list-style-type: none">- Develop and document DT-BSC process framework- Fully address the research question- Complete the literature review of the PhD thesis- Complete drafts of related chapters for PhD thesis
Action planning	<p>The contribution you expect those outcomes to make to your long-term goals, and why you expect it?</p> <ul style="list-style-type: none">- Complete the Research part of this AR project- Document key contribution to knowledge for PhD thesis <p>The actions you plan to take to achieve those outcomes and why you think those actions will achieve those outcomes in that situation?</p> <ul style="list-style-type: none">- Write up the literature review properly so as to compare AR learning from cycles 1 to 5 to current academic knowledge- Review all data from written notes, journal logs, e-mails, pictures, reports, PowerPoint slides related to the major AR cycles 1 to 5 and the other product development cycles.- Review formal and informal meetings on the progress of the strategy prototypes- Improve upon the model in Cycle 5, develop and document the DT-BSC framework

Table 4.7 (Continued)

Action	<p>What actions you carried out, and what outcomes you achieved?</p> <ul style="list-style-type: none"> - Submitted drafts of chapters 1, 2 and 3 of the PhD thesis for review. - Documented DT-BSC process steps using PowerPoint slides as a storyboard prototype to get a visual representation of the main ideas. - Completed the documentation as per Section 4.3.
Evaluation	<p>How and why these differed (if they did) from what you expected?</p> <ul style="list-style-type: none"> - Prototyping the process framework through a storyboard really helped visualize the whole process. Using these DT practices made the documentation easier. - Maintained many of the features mentioned in the Evaluation and Learning stages of Cycle 4. - Maintained the visual aspect of the strategy map but avoided difficult to proof concepts like cause-effect relationships, stringent constructs like the four perspectives. Work by (Field, 2011) as shown in Figure 4.10 was most helpful. - De-emphasized the importance of measures while highlighting the role of prototypes, a key DT practice. - Introduced the concept of ‘Strategy by Prototyping’. - Realized that this process is unlike normal strategy planning approach where the planners and the doers are separate. It integrates the planners (more of facilitators of the process) and the doers and also engages the role of the customers.
Specifying learning	<p>What you learned about the client system, your methodology, yourself and so on?</p> <ul style="list-style-type: none"> - Was really excited about the ‘Strategy by Prototyping’ phrase adapted from ‘Strategy by Simple Rules’ phrase (Eisenhardt and Sull, 2001). Decided to do a Google search on the phrase. Results shown in Figure 5.2. - With the simple storyboard using PowerPoint it becomes easy to insert new points of discussion regarding the process framework like Figure 4.14. - Achieved the objectives of Cycle 6 as per Diagnosis stage. - Emphasized the role of capabilities (Hamel & Prahalad, 1996; Field, 2011) in the process. - Table 4.4 highlights the DT practices embedded in the process. - Obviously need to get feedback. Plan to conduct focused small group discussions in the next AR cycle to solicit points for improvement and candidates for trying out the process. The focused groups will include users, practitioners and academics.

4.4.2 DT-BSC Process Framework

Figure 4.14 summarizes the DT-BSC process framework. The core component is the **Dynamic Actionable ‘Strategy by Prototyping’ Visual Template**. This section will discuss the step-by-step process with examples taken from Cycles 1 to 5.

4.4.2.1 Step 1 - Define Core Purpose

Collins and Porras (1994) explained the core purpose as a guiding philosophy that leads to a tangible image of the company. The guiding philosophy is a system of fundamental motivating assumptions, principles, values, and tenets, which provide the company with character. They suggest that vision is the starting point for goal or objective setting and found in their research that visionary companies develop deep and rich goals as a powerful way to stimulate progress. Vision is clearly a

fundamental aspect of the strategic process, irrespective of any driving philosophy and irrespective of the size of the firm. Kaplan and Norton (2008) viewed that direction setting in terms of mission, values and a quantified vision, is perhaps the most important responsibility of senior leaders in an organization. The first step in strategy development is to affirm the work that the leadership team has done in defining and articulating the organization's mission, core values and quantified vision (Palladium, 2010, p. 1-24).

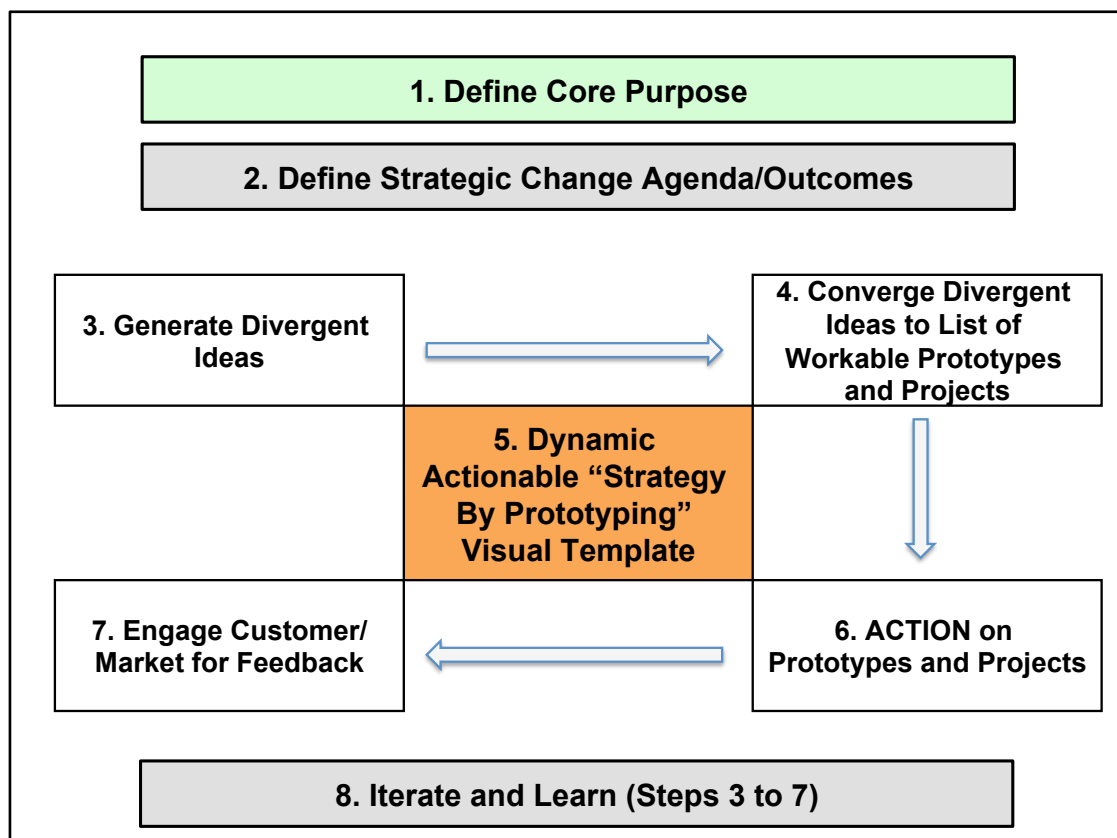


Figure 4.14
DT-BSC Process Framework

Figure 4.15 shows the mission, core values and long-term vision of The Firm. This work was done before Cycle 1 and regularly affirmed in many of The Firm's strategic planning meetings and communication with the staff. From a design perspective, the core purpose puts constraints to the organization in terms of the industry it is participating (ICT for The Firm), ethical considerations and values. Constraints like dimensions, colours, logos, features and functions are an important part of design. Simple examples include the design of sports apparel that reflects a country's sporting colours like orange for Holland and Azure blue for Italy or the sponsor's brand like the three stripes by Adidas.

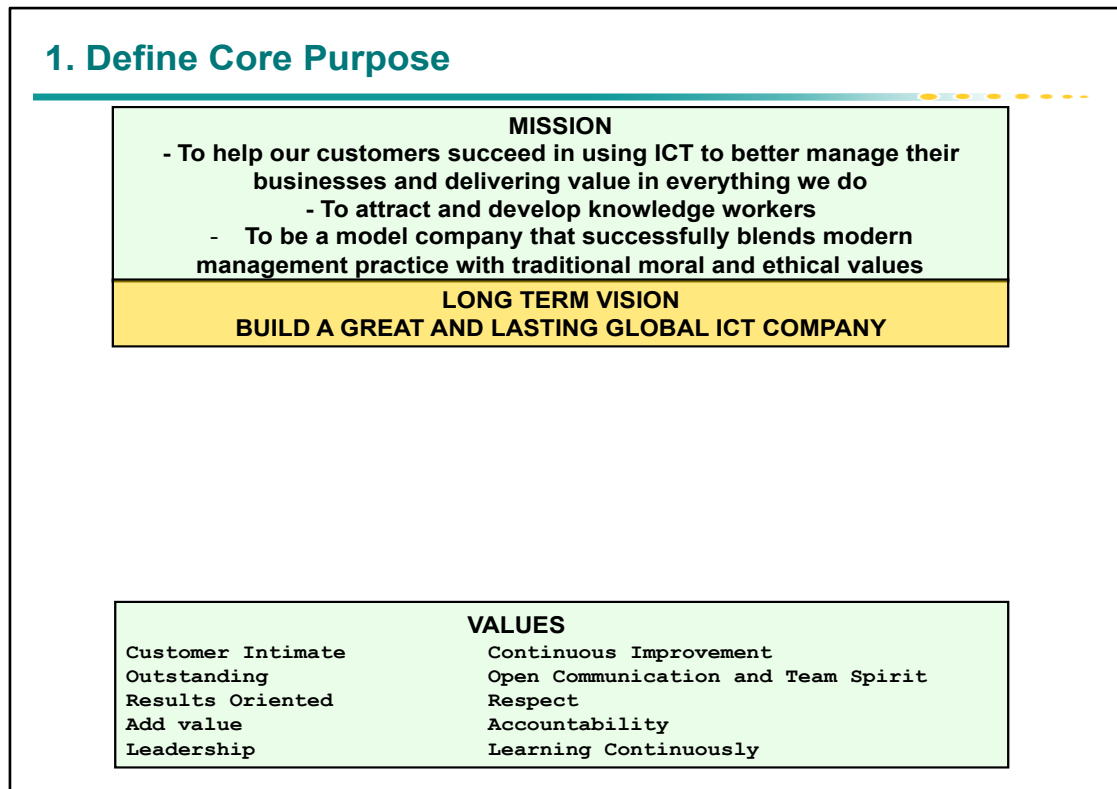


Figure 4.15

Mission, Vision and Values Define the Core Purpose

4.4.2.2 Step 2 - Define Strategic Change Agenda/Outcomes

Core purpose and strategic direction engage managers and create the picture of the organization's future. But they are of little sustainable value if they cannot be translated into mandatory change actions. Strategy begins by articulating the extent to which change must occur. Otherwise the organization can continue along the 'business as usual' path and may still experience incremental improvements in performance (Figure 2.4). Kaplan and Norton (2008, p. 42) introduced the 'Strategic Change Agenda' as a tool to explain why a major change is necessary. It compares the current (as-is condition) status of several important aspects of the organization like capabilities, markets and products with what they need to become (to-be condition) in the next few years.

Figure 4.16 and Figure 4.17 show the strategic change agenda of The Firm after deliberations from Cycle 1 and Cycle 2. Clearly the broad ideas shown in Figure 4.16 must be translated into more details following the example template similar to (Kaplan & Norton, 2008, p. 43-44) as in Figure 4.17.

2. Define Strategic Change Agenda/Outcomes



Figure 4.16
Broad Strategic Change Agenda

2. Define Strategic Change Agenda/Outcomes

From... (As Is)		...to (Will Be In 3 Years)
Revenue 31M	Growth	Revenue 50M
SI and VAR B2B, B2G	Business Model	<ul style="list-style-type: none"> • Increase own products/solutions/ services • Grow B2C
Technical Project Management	Capabilities	<ul style="list-style-type: none"> • Other technical • CMMI
	Innovation	More innovative, DT
	Image/Branding	<ul style="list-style-type: none"> • Oracle Premium Partner Co-Branding • Facebook
Very little	Design and product development	Own products
ICT	New Businesses	<ul style="list-style-type: none"> • Mobile commerce • Portfolio Investments
Defined	Culture and values	<ul style="list-style-type: none"> • Conscious effort to implement • More awareness programs

Figure 4.17
Strategic Change Agenda to Clarify Vision and Areas of Change

The change agenda above emphasizes innovation and design practices in terms of capabilities and also the creation of new ‘own’ products and new businesses like mobile commerce. Clearly there are big gaps between the current ‘as-is’ situation and the desired ‘to-be’ future. With the gaps defined it is easier to understand the areas where improvements are required. But what is the extent of improvement required within the planning period (3 years)? This is where Kaplan and Norton (2008, p. 40) emphasized the need to quantify the vision. Although defining quantitative measures take time and effort and are not easy to implement, some simple measures are helpful to monitor the outcomes of the strategy. The researcher proposes to retain the ‘Strategic Outcomes’ construct as discussed in Cycle 5.

Figure 4.18 shows the strategic outcomes taken from the strategic change agenda (Figure 4.17). This is consistent with the problem statement of the AR project, ‘New growth by increasing the innovation capability of The Firm through the use of DT’. The growth outcome is in the revenue and the innovation outcome is in the ‘own products/solutions/services’ and the two breakdown components of revenue; increase revenue from B2C and increase revenue from investments. Figure 4.18 also shows the progress in building the ‘strategy by prototyping’ visual template.

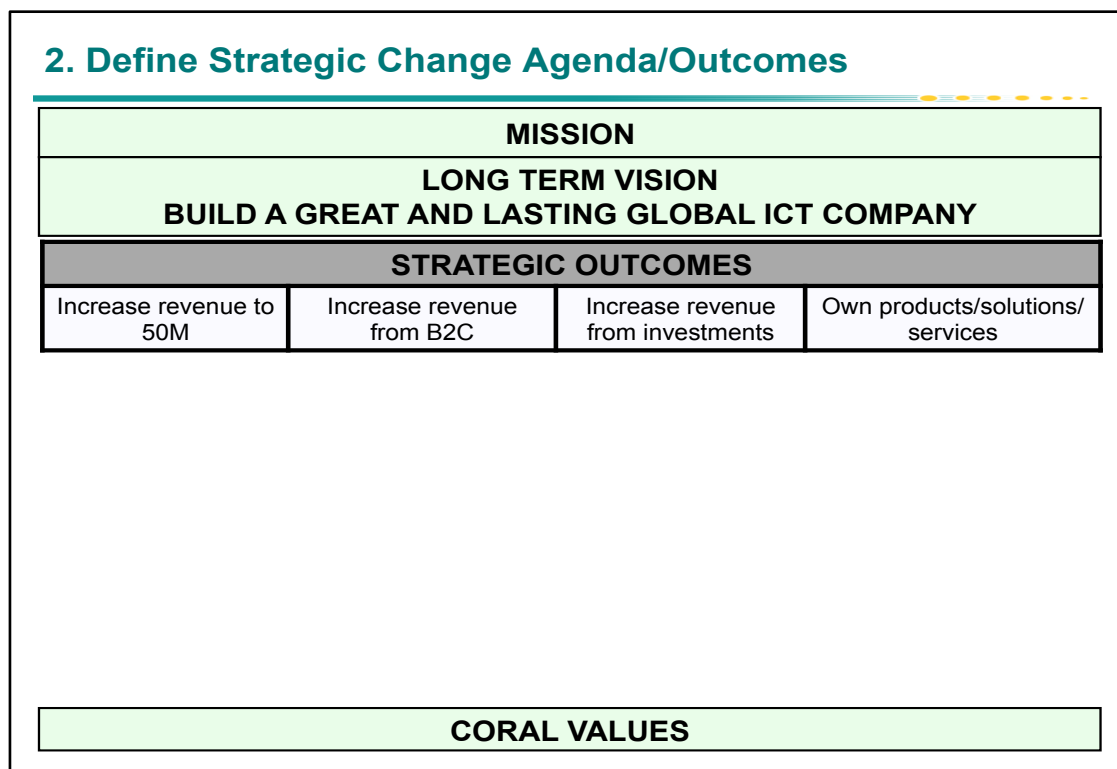


Figure 4.18
Core Purpose and Strategic Outcomes

4.4.2.3 Step 3 - Generate Divergent Ideas

This is the step when the planners must begin to meet the implementers since the details of strategy can be crafted at the bottom of the company (Hamel, 1996) where they are closest to the markets, customers, suppliers and new technology details. This is also the step that the first formal DT practice of divergent thinking is integrated into the process framework. Steps 1 and 2 are analogous to preparing the classic starting point for a typical **product design** project, the design brief. “The brief is a set of mental constraints that gives the [design] project team a framework from which to begin, benchmarks by which they can measure progress, and a set of objectives to be realized” (Brown, 2009, p. 22). Thus Steps 1 and 2 is the **strategy brief** in a **strategy design** project. Once the broad strategy brief is set, typically by leaders, managers and senior staff, the implementers can begin to generate divergent ideas on how to realize the strategy. Brown (2009, p. 66) called it divergent thinking and Liedtka and Ogilvie (2011, p. 21) termed it as asking the ‘What if’ question. The approach is to generate as many possible ideas.

3. Generate Divergent Ideas

- ❑ Many simple techniques
 - World Café
 - Timeline
 - Open Space
 - Voting
- ❑ SWOT and TOWS matrix
- ❑ PESTEL (Political, Economic, Social, Technological, Environmental and Legal)
- ❑ Affirm the Customer Value Proposition (CVP)
- ❑ Affirm current strategic capabilities
- ❑ Find the “white space” (Hamel & Prahalad, 1994, p. 84)
- ❑ What If ? (Liedtka & Ogilvie, 2011, p. 21)
- ❑ Divergent and convergent thinking (Brown, 2009, p. 66)
- ❑ Close the value gap (Kaplan & Norton, 2008, p. 37)

Figure 4.19
Guidelines for Generating Ideas

3. Generate Divergent Ideas – What If or Divergent Possibilities From Cycle 1

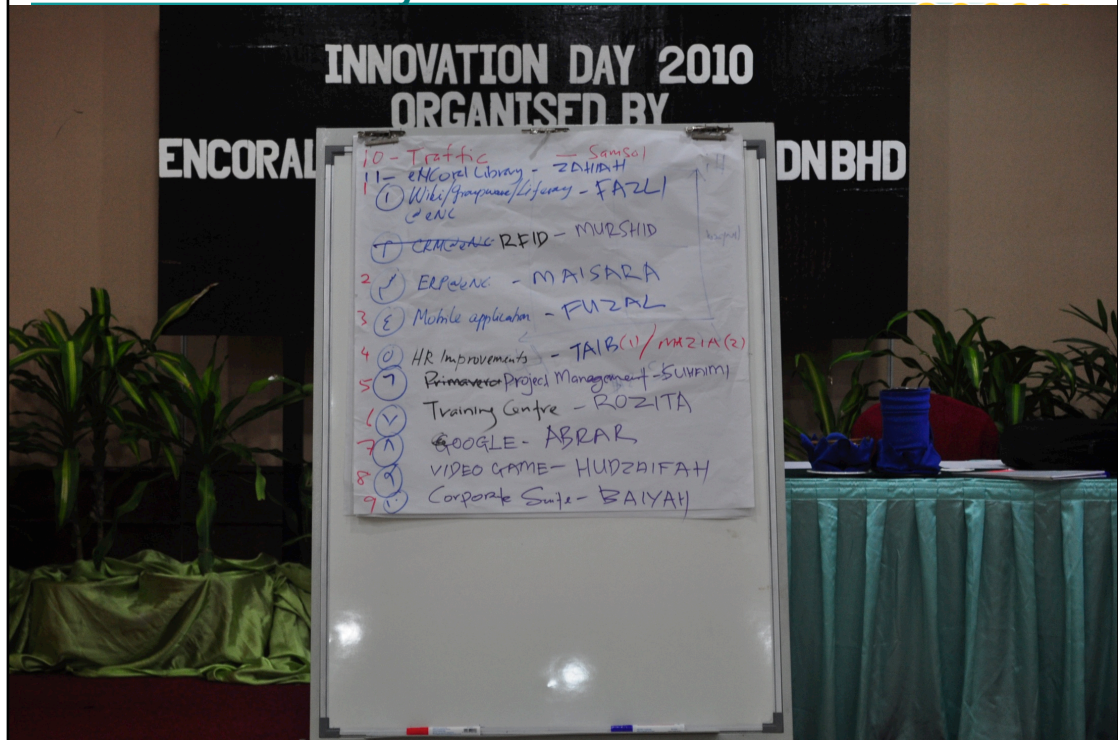


Figure 4.21
Divergent Ideas Generated

3. Brainstorm to Generate Ideas – Value Gap (Cycle 2)

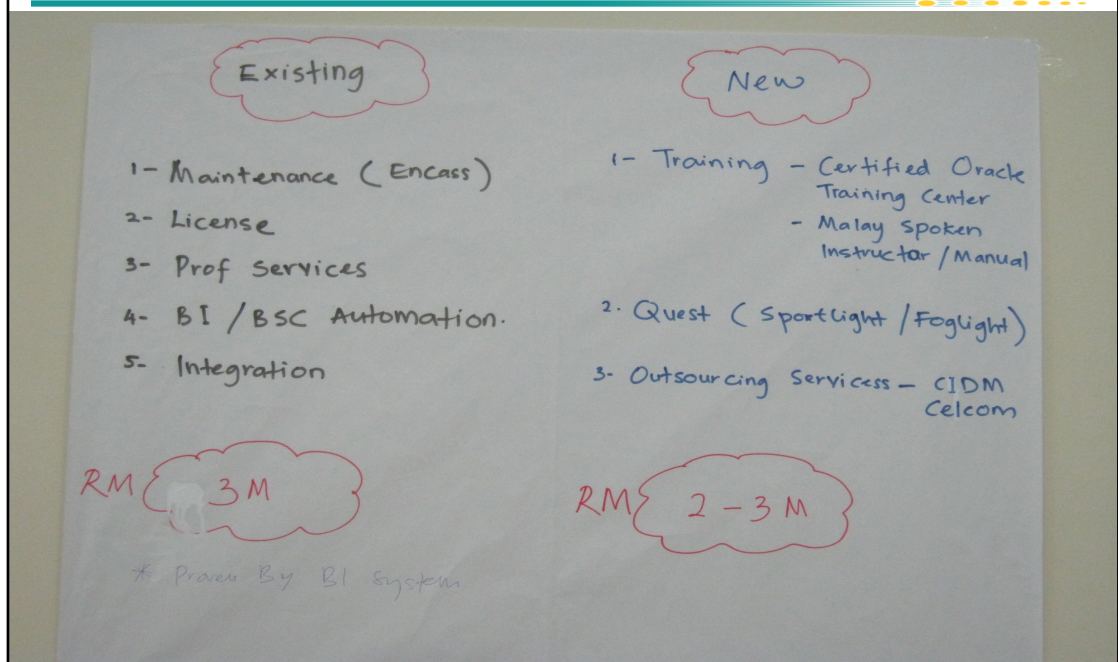


Figure 4.22
Closing the Revenue Gap

Kaplan and Norton (2008, p. 39) proposed that the essence of strategy is closing the value gap from the current situation to the desired situation. There is quite a big value gap for the revenue of The Firm as shown in Figure 4.17. During this step it is important to generate ideas on how this value gap can be closed. Figure 4.22 shows how one department plans to increase the revenue from its existing and proposed new businesses.

4.4.2.4 Step 4 - Converge from Divergent Ideas to List of Workable Project Plans and Prototypes

Obviously not all the divergent ideas generated are workable. They need to converge to what is feasible (functionally possible within the foreseeable future), viable (likely to become a sustainable business) and desirable (makes sense to people and for people or customers) (Brown, 2009, p. 18-19). Figure 2.21 shows the ‘What if’, ‘What wows’ and ‘What works’ converging process. The idea is actually quite simple. Not all ideas can be worked upon given the obvious constraints of budget, people resources, available technical capabilities and time, especially for SMEs. Furthermore the ideas must be viable in the near future. The SME needs to develop some criteria to choose the workable ideas and most importantly translate the ideas into simple prototypes and project plans. These workable ideas occur at the intersection of three criteria: Customers have to want it, the ability of the company to produce and deliver, and doing so allows the company to meet its business objectives (Liedtka & Ogilvie, 2011, p. 128).

Figure 4.23 shows the ideas short-listed by the core team after Cycles 1 and 2. The ideas highlighted (italics and underlined) are ‘white space’ ideas that can potentially generate revenue. The ideas were assigned to project leaders who then developed simple project plans similar to the example in Figure 4.12.

Brown (2009) discussed the shift that designers have made in thinking away from the design problem to the design project. The project is the vehicle that converts an idea to reality. “The clarity, direction, and limits of a well-defined project are vital to sustaining a high level of creative energy” (Brown, 2009, p. 21).

At this step, it is important to verify that the selected ideas to be worked on actually help to achieve the strategic change agenda and outcomes. Figure 4.24 is a simple template that maps the ideas for prototyping with the strategic change agenda.

Although idea number four on the ‘Corporate Suit’ has no major impact on the strategic agenda it was retained for delivering quick results out of Cycles 1 and 2 as discussed in Tables 4.1 and 4.2. The Firm wanted to show tangible proof that it was committed to implement workable ideas from the planning workshops.

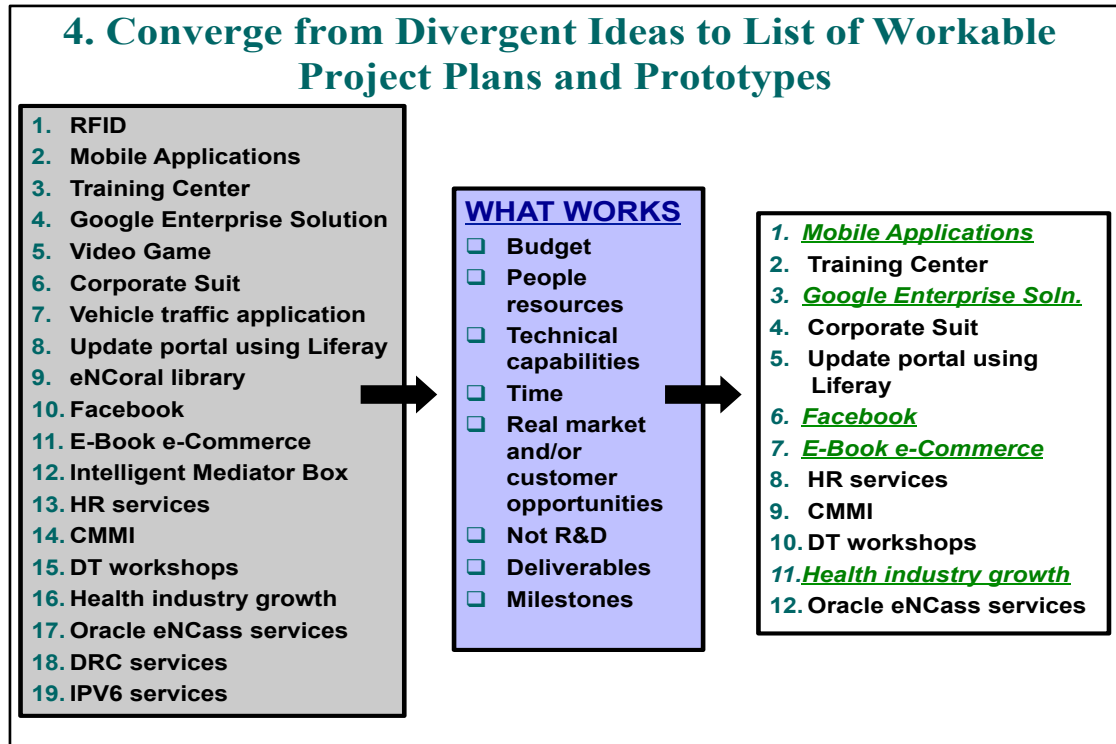


Figure 4.23
Selected List of Workable Ideas From Cycles 1 and 2

4. Converge from Divergent Ideas to match the strategic change agenda

Ideas for Prototyping

Strategic Change Agenda	1	2	3	4	5	6	7	8	9	10	11	12
Growth	X	X	X			X	X				X	X
Business Model	X					X	X					
Capabilities					X				X	X		X
Innovation	X		X			X	X			X		
Image/Branding		X		X					X			
Design and product development	X					X	X			X		
New Businesses	X	X	X	X		X	X				X	
Culture and values										X		

Figure 4.24
Template to Map Change Agenda With Tangible Ideas

4.4.2.5 Step 5 - Actionable ‘Strategy by Prototyping’ Visual Template

Prototyping is a fundamental DT practice as discussed in Section 2.3.9. Liedtka and Ogilvie (2011, p. 142) asserted that prototyping is one of the most tangible differences between DT and normal business thinking. It is also highlighted in the evaluation and learning stages of Cycles 2 and 4. In Cycle 5, the key role of initiatives in making strategy actionable and quick to implement was highlighted. The term initiative is borrowed from the BSC model. Figure 4.8 shows its original causal relationship to the strategic objectives (initiatives to help meet the targets related to the measures that relate to the objectives). In the ‘Specifying Learning’ stage of Cycle 3 the researcher coined the simple term ‘Strategy by Prototyping’ by linking strategy to two DT practices of prototyping and iteration. In the same stage of Cycle 4 the researcher noted some parallels in ‘Strategy by Prototyping’ as noted in Cycle 3 with ‘Strategy by Simple Rules’ (Eisenhardt & Sull, 2001) while doing the literature review. Prototyping connotes a quicker, simpler and less formal approach in converting an idea to reality. Prototyping an idea also connotes that the idea itself maybe vague in terms of features and scope in the beginning, but it then takes a concrete shape over several prototyping adjustments. Initiatives in the BSC context however take a much more formal and structured meaning with defined sub-processes as summarized in Figure 4.25. Prototyping is quicker, simpler and less formal than the BSC initiative.

Collins and Hansen (2011) reported on a nine-year research on why some companies thrive in uncertainty and focused one of the topics on innovation. They summarized the approach of these companies on creativity and innovation through the phrase ‘fire bullets, then cannonballs’ (Collins & Hansen, 2011, p. 69). A bullet represents a low-cost, low-risk and low-distraction test to validate what will actually work. Prototypes are similar to these test bullets. Once the company knows how to make it really work by firing many bullets or testing many prototypes, it then fires a cannonball that has been calibrated from the many tests through the bullets. Companies validate their strategies by testing it out and then mobilize its full resources to implement the tested strategy in a big way.

In addition to ‘strategic prototypes’, the researcher views that SMEs should be conscious of the existing and new capabilities they intend to enhance to strengthen

their competitive advantage. The role of competencies and strategy for SMEs is discussed in Section 2.1.4.

‘Strategic prototypes’ and ‘strategic capabilities’ then form the final two components of the simple visual strategy template shown in Figure 4.26. It highlights the initial list of strategic prototypes to be worked upon (Figure 4.21) and the strategic capabilities of The Firm (Figure 4.17). ‘Asset Management’ was added on later as ‘Portfolio Investments’ in property and listed stocks began to contribute significantly to The Firm’s revenue.

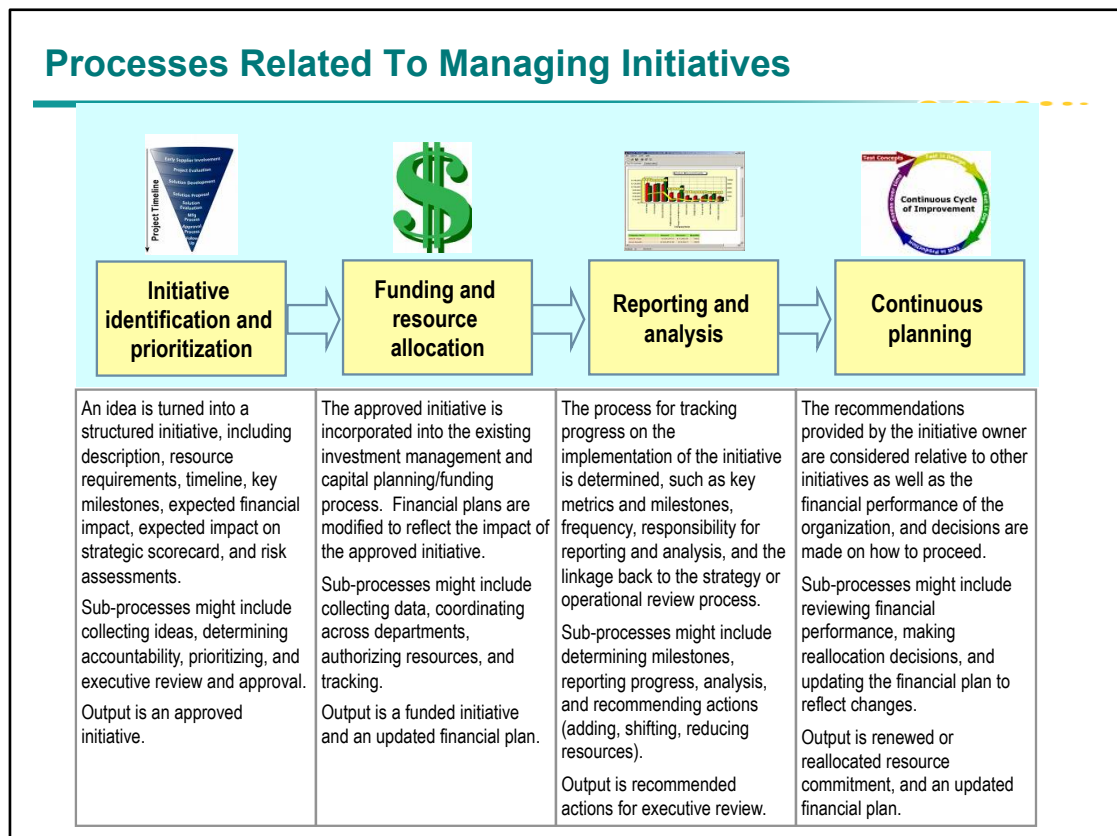


Figure 4.25

Formal Processes Related to Initiatives (Kaplan & Norton, 2008)

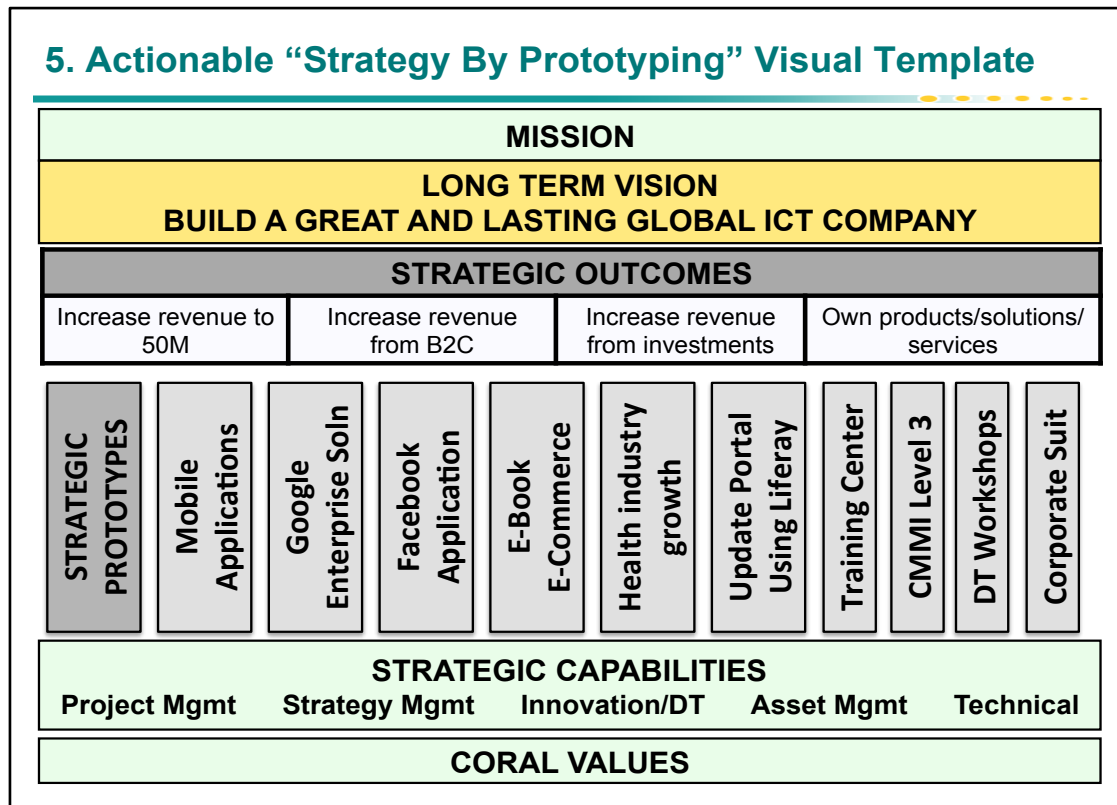


Figure 4.26
New Visual Strategy Template

Following the work from Cycle 5, the visual strategy template is adapted from the BSC Strategy Map but without the four perspectives or the short strategic objective phrases. It retains the concept of balance between:

- i. outcomes or results (mission, vision, strategic outcomes) and drivers or activities (strategic prototypes, building strategic capabilities, practicing values)
- ii. the ‘what’ of strategy and the ‘how’ of strategy
- iii. long-term results (mission, vision) and activities (practicing values) and medium-term results (strategic outcomes) and activities (strategic prototypes, building strategic capabilities), with medium-term referring to the planning horizon of 3 years as in this case.
- iv. strategy development techniques (mission, vision, strategic capabilities, values) and strategy implementation (strategic prototypes, building strategic capabilities)

The template also incorporates some important basic constructs from strategy development (Collins & Porras, 1994; Hamel & Prahalad, 1996; Kaplan & Norton, 1996, 2008). The DT practice of visualization is adopted in the process of creating

the template while prototyping forms the core strategic content of the strategy template. The innovation content in the template is in the ‘white space’ ideas and adopting the DT practices. Clearly the strategic prototypes form the core component of the strategy template and link the components with an emphasis on taking practical action. This template integrates strategy management with DT and as mentioned in Section 1.4 and Section 2.3.6 of this thesis, while this linkage between design and strategy “may seem either radical or abstract, those who discover its advantages find it surprisingly intuitive and practical – just what the business world needs in the face of high-stakes complexities and change” (Fraser, 2007, p. 67).

4.4.2.6 Step 6 - ACTION on Prototypes and Projects

Obviously the next step is to act on progressing the prototypes and implementing the projects. From the experience in the major AR cycles and the product prototypes, a major learning practice note is when do the prototyping iterations stop? The prototypes and its iterations involve costs. As mentioned in Section 2.3.10, the most glaring element that is missing in DT is cost and the cost issue is not discussed in many DT references. The cost element must be particularly considered when DT practices are to be introduced to SMEs especially in relation to strategy.

It is important to develop some simple criteria to stop the prototyping and terminate the implementation of the project or adapting the project with new deliverables and milestones. The criteria may include:

- i. exceeding the budget;
- ii. not meeting project schedules;
- iii. people resources not available or busy;
- iv. not meeting business criteria like minimum revenue;
- v. negative customer or market feedback.

Obviously the core person or team responsible for the overall strategy implementation must review with the assigned project leaders on the action progress of the prototypes and projects and make the relevant decisions. The key activity is to act on moving the projects and prototyping iterations and to learn from the problems encountered. Inaction on a strategic prototype often indicates there are major problems that require drastic action.

4.4.2.7 Step 7 - Engage Customer/Market

As mentioned in the evaluation and learning stages of Cycle 3, feedback from customers has great benefits. The SME must be brave and open to solicit feedback. Customer feedback is just the first and, perhaps, the simplest step in engaging with the customer on strategy. In general, customers do not care much about company strategies but they are willing to give feedback on company products, services and solutions when engaged properly.

Liedtka and Ogilvie (2011, p. 159) discussed customer co-creation as one of the DT tools. The first version of The Firm's own products ICMS, CoralHR and CORRAD, were all developed based on the custom requirements of specific customer organizations. The Firm then added and improved upon the features and functions of the software products. This is the best form of customer co-creation since the customer pays for the first version and also becomes a reference case. The key learning point here is to look at opportunities of extending the solutions developed for specific customers into more generic versions that can be marketed to similar customers.

Appendix A.4.3 describes another example of customer co-creation that was used in the e-book prototypes. A simple Web application was developed to encourage the customers to vote on the cover designs for the e-books and also to submit their own designs.

Social media tools like Facebook, Twitter and blogs offer huge opportunities to engage with customers. Companies in the B2C space must engage with customers through social media to get feedback, suggestions and also complaints. Even the simple number of 'Likes' from a Facebook posting provides useful data. As a matter of fact, many customers commented that they prefer to buy printed versions of the e-books. This led to The Firm teaming up with a book publisher to produce and market printed versions of the e-books. This idea was never part of the ideas generated from AR Cycles 1 or 2 but came from the customers. The Firm had to revisit its capabilities and decided that the best option was to partner with a book publisher and focus on developing the book contents, since The Firm does not have print and publishing capabilities.

Social media also offers opportunities to extend the reach from the direct customers or 'friends' to 'friends of friends' in Facebook language. The social media

experience is an interesting learning practice note in customer co-creation from this AR project, but is not the focus topic of this thesis.

As mentioned in Step 6, customer feedback is an important criterion to stop or adapt the strategy prototyping. Negative feedback must be taken based on its merit and action must be taken in response even if it means to terminate a strategic prototype, adjust the features and even the price.

4.4.2.8 Step 8 - Iterate and Learn (Steps 3 to 7)

This final step in the DT-BSC process framework is to emphasize that strategy becomes dynamic through action and learning from doing. SMEs must launch the strategy or the new product or service as soon as possible. It is important to try the prototype with the real users or the real customers quickly and inexpensively. Find out if the real internal user is willing to use the new business improvement internal process. Will the real customer use and pay for the product or new product features and functions? Of course this is done after a certain level of readiness but it cannot be delayed until the product or service or strategy is deemed complete and error-free. It is a lot easier to learn and improve from real customer and user feedback rather than repeated cycles of internal testing of the product or analysis of the strategic idea. As a simple analogy, there will not be an iPhone 5 if not for the first iPhone 3 or Windows 8 if not for Windows 1.0, which the market actually rejected.

The hallmark of DT is its ability to bypass the culture of debate, discussion and historical analysis and help managers learn through action in the customer and market place (Liedtka & Ogilvie, 2011, p. 167). The companies that outperformed others in their industry and became great by their own choices had the learning discipline to ‘fire bullets’ before fully exploiting a new idea or innovation and release the ‘cannonballs’ (Collins & Hansen, 2011).

As an example, The Firm quickly worked on the ‘Corporate suit’ which was easy to do and with the purpose to practically show that it was committed to implement the ideas from Cycles 1 and 2. The Firm then noticed that the usage was much less compared to company T-shirts. Is it because of the design of the shirt or is it because of the informal working culture in The Firm? Obviously there are lessons to be learned only because the strategic idea was prototyped and implemented.

In the case of the e-books the sales per unit for the ‘SOP’ title code are highest for the Apple app version followed by the printed and the PDF versions, although the PDF version has the highest gross margins. This led The Firm to focus more on the Apple app version and to also extend from the Apple market place to the Amazon and Google market places for 2013. That has been implemented and the book is available on Amazon using their print-on-demand technology since June 2013.

Figure 4.27 shows a simple visual profile of the strategic prototypes during the strategic planning period. Strategy becomes dynamic through action and learning by doing. Some of the initial ideas from Cycles 1 and 2 are no longer pursued. Some like the Apple apps, health industry and e-books are now stable businesses generating new revenue for The Firm. Iterating Steps 3 to 7 also led to new strategic ideas that are progressing well and have started to contribute revenue.

Dynamic Strategic Prototypes Through Action		
2011 Prototypes	2012 Prototypes	2013 Prototypes
Mobile Applications	Apple Apps	Apple Apps
Google Enterprise Soln	Google Enterprise Soln	Android CoralHR
Facebook Application	Facebook Application	Web CoralHR
E-Book E-Commerce	E-Book E-Commerce	E-Book E-Commerce
Health industry growth	Health industry growth	Health industry growth
Update Portal Using Liferay	Edu Stabilo (ICMS Cloud)	Edu Stabilo (ICMS Cloud)
Training Center	CORRAD	CORRAD
CMMI Level 3	CMMI Level 3	CMMI Level 3
DT Workshops	DT Workshops	DT Workshops
Corporate Suit	Golden Gate	
Stop		Progress
Slow Progress		Stable new revenue or successful implementation

Figure 4.27
Simple Visual on Progress of the Strategic Prototypes

4.4.3 DT-BSC Process Framework and the Research Question

Table 4.8 summarizes the DT-BSC process framework. It highlights the key concepts from strategy and the DT practices (in bold and italics) incorporated in the process.

Table 4.8
DT-BSC Integration Summary

Step	Description	Idea/Concept/Practice
1.	Define Core Purpose	<ul style="list-style-type: none"> (Collins & Porras, 1994) Provides purpose and character Constraints in terms of industry, ethics, values. <i>Constraint is an important aspect of design;</i>
2.	Define Strategic Change Agenda/Outcomes	<ul style="list-style-type: none"> (Kaplan & Norton, 2008, p. 42-44)
3.	Generate Divergent Ideas	<ul style="list-style-type: none"> Find the ‘white space’ (Hamel & Prahalad, 1994, p. 84) <i>What if? (Liedtka & Ogilvie, 2011, p. 21)</i> <i>Divergent thinking (Brown, 2008, p. 66)</i> Close the value gap (Kaplan & Norton, 2008, p. 40)
4.	Converge from Divergent Ideas to List of Workable Project Plans and Prototypes	<ul style="list-style-type: none"> <i>What wows, works? (Liedtka & Ogilvie, 2011, p. 21)</i> <i>Convergent thinking (Brown, 2008, p. 66)</i> <i>Prototyping DT practice</i>
5.	Actionable ‘Strategy By Prototyping’ Visual Template	<ul style="list-style-type: none"> (Collins & Porras, 1994) core purpose (Kaplan & Norton, 2004) strategy map <i>Visualization DT practice</i> <i>Strategy by prototyping (from DT practice)</i> RBV of strategy; capability as step before core competency (Hamel & Prahalad, 1994). See Fig. 2.8. Innovation through ‘white space’ Bullets, then cannonballs (Collins & Hansen, 2011, p. 69)
6.	ACTION on Prototypes and Projects	<ul style="list-style-type: none"> <i>Hallmark of DT is learning through action (Liedtka & Ogilvie, 2011, p. 167)</i> Stop and adapt criteria are critical
7.	Engage Customer/Market	<ul style="list-style-type: none"> <i>Customer co-creation (Ramaswamy & Gouillart, 2010; Liedtka & Ogilvie, 2011, p. 159)</i>
8.	Iterate and Learn (Steps 3 to 7)	<ul style="list-style-type: none"> <i>What wows, works? (Liedtka & Ogilvie, 2011, p. 21)</i> <i>Learning launch (Liedtka & Ogilvie, 2011, p. 167)</i> <i>Iteration DT practice</i> Strategy is dynamic, action oriented, learning and adapting from customer/market

Section 1.6.1 describes the main research question as ‘how to develop and formulate a new, simpler and more action-oriented approach for strategy development and implementation for SMEs that integrates DT and the BSC while incorporating features that address some of the gaps and issues related to strategy and SMEs’. In Section 2.1.6 the researcher highlights some important elements in developing a strategy framework for SMEs. The first part of the research question has been addressed through the eight steps of the DT-BSC Process Framework and summarized in Figure 4.14 and Table 4.8. Table 4.9 lists some of the gaps and issues related to strategy and SMEs as mentioned in Section 2.1.6 and how the DT-BSC framework addresses these issues.

Table 4.9

DT-BSC Framework Addressing Issues Related to Strategy and SME

Issue	Response
Simplicity	<ul style="list-style-type: none"> • Strategy developed through a simple 8-step process that although has credible academic input does not require understanding of its thought foundations. • Simple visual template to describe the output. • Simple visual template to monitor overall progress and simple measures for the outcomes. • Simple but sufficient since it addresses the basic working definition of strategy (Section 2.1.1).
Resource constraint time, people and skills	<ul style="list-style-type: none"> • 2 one-day workshops to complete Steps 1 to 5. • 1 one-day workshop using simple tools to understand DT practices (as per AR Cycle 4). • Small core team (3 people for The Firm with more than 200 employees). • Estimated 4 weeks from the first workshop to Step 5 assuming the second workshop is done within 3 weeks of the first. • Basic project management skills. Simple productivity software tools to prepare spreadsheets and slides. • No complex strategy planning techniques required. • No complex measures or KPI skills required.
Costs cheap to implement, no consultants	<ul style="list-style-type: none"> • BSC consultant not needed. • Most of the ideas expected to come from the SME owners, managers and staff. • Focus is on the broad direction, knowing the customers/markets, understanding the capabilities and identifying the workable new ideas.
Leadership role mission, values, vision	<ul style="list-style-type: none"> • Addressed in Step 1.

Table 4.9 (Continued)

Culture and values	<ul style="list-style-type: none"> Addressed in Step 1 and Step 3 on workable ideas how to enshrine the culture and values and make it practical.
Leverage on competencies for greater value	<ul style="list-style-type: none"> Addressed in Step 2, Step 3 and Step 5.
Timely	<ul style="list-style-type: none"> Framework designed to be dynamic and timely by adapting from the lessons learned and opportunities that arise from Steps 5, 6 and 7.
Actionable	<ul style="list-style-type: none"> Strongly emphasized in the model through Steps 5, 6, 7 and 8. Actionable immediately by developing simple prototypes Focus on action through prototyping and iteration
Build innovation	<ul style="list-style-type: none"> 'White space' ideas when the company extends the use of current capabilities to address new markets and develop new products/services/solutions. Innovation built into the process through the application of DT practices like prototyping, visualization, collaboration and customer engagement. In addition, DT practices help increase the innovation capability of the staff and company. Many scholars have validated this relationship of design and innovation, as in Section 2.3.6.
Informality in documentation, follow-up mechanisms, reviews	<ul style="list-style-type: none"> Step 5 and Figure 4.27 are the real summary documentation required. Preferably use some simple on-line collaboration tool like Wiki or blogs to share views, comments and learning points. The Firm uses its monthly project review meetings to include progress updates on the Strategic Prototypes. Informal meetings of core team.

The DT-BSC process framework is able to address all the issues related to strategy and SMEs as mentioned in Section 2.1.6. These factors are explained through Table 4.9. In addition it integrates some best practices in strategy management like the BSC, core purpose, customer co-creation and strategic capability building. DT by itself is a new and popular idea related to innovation in management practice as described in Section 2.3.4. Thus the DT-BSC framework has the elements of being modern, innovative and incorporating best practices. This qualifies it as a new and unique contribution to the body of knowledge related to business strategy management and also the applications of DT.

Cycle 6 has completely addressed the research question and responded to the other qualitative issues related to strategy and SMEs. Section 4.4 presented and discussed the main results of the **research** part of the AR project. The DT-BSC

Process Framework is a new contribution to the body of knowledge in both business strategy management and the application of DT, especially in the context of SMEs.

The obvious thing to do next is to present the research results to solicit feedback. The feedback is not to validate the framework but to look for points of improvement. The plan is to conduct focused small group discussions that will cover potential users, practitioners and academics.

4.5 The Final AR Cycle

The ‘Specifying Learning’ stage of Cycle 6 noted the need to solicit feedback on the completed DT-BSC Process Framework since it was derived from a singular case study. This final cycle extends the collaboration practice in AR to cover other participants that are interested in the research. It is also part of the AR practice to make the knowledge public. French (2009d) and Daniel and Wilson (2004) in using AR for work that has some similarities with this AR project, also conducted workshops and seminars to present their findings. There will only be qualitative data from comments made by the participants of the focused group discussions conducted in this cycle. This cycle also involves writing the final parts of the thesis.

4.5.1 Cycle 7 Summary Table

Cycle 7 is the final major AR cycle. The need for feedback and better research vigor led to the plan to engage different participants through the focus group discussions. The participant groups included strategy practitioners, academics and potential users. Three different discussions were held at different locations and days. In addition, the researcher conducted three training workshops on the DT-BSC Framework with SME owners and managers, academics and a local bank focused on SME financing. Two groups are homogenous in that all the participants were from the same organization. A simple questionnaire was used to get structured feedback.

The discussions and workshops are not intended to validate the results or knowledge findings from the research but to solicit comments and to gauge interest from the different groups. The interest shown by academics was encouraging. Some customers and strategy practitioners were interested to try out the DT-BSC Process Framework. This further ensured the researcher that the research topic and findings are of value to others.

Table 4.10
Summary Documentation of Cycle 7

Cycle 7: Feedback on the DT-BSC Process Framework	
(May 2013 to Jun 2013)	
Diagnosis	<p>The outcomes you hope to achieve in this next cycle, and why you think they are worth pursuing?</p> <ul style="list-style-type: none"> - Feedback on further points to improve the completed framework - Complete drafts of related chapters for PhD thesis
Action planning	<p>The contribution you expect those outcomes to make to your long-term goals, and why you expect it?</p> <ul style="list-style-type: none"> - Finer improvements to the framework - To gauge interest in the research topic in Malaysia <p>The actions you plan to take to achieve those outcomes and why you think those actions will achieve those outcomes in that situation?</p> <ul style="list-style-type: none"> - Conduct focused small group discussions by first presenting the main aspects of the AR project and the DT-BSC framework. - Participants will cover potential users, BSC practitioners and academics.
Action	<p>What actions you carried out, and what outcomes you achieved?</p> <ul style="list-style-type: none"> - Prepared the presentation slides for the discussion. - Conducted 3 group discussions - Prepared a simple form to get structured feedback (Figure 4.28) but not for statistical analysis since the number of responses is expected to be small. - Completed the full documentation of the DT-BSC framework as per Section 4.3.
Evaluation	<p>How and why these differed (if they did) from what you expected?</p> <ul style="list-style-type: none"> - Interest from academics and strategy practitioners was very encouraging. - Some expressed interest to use
Specifying learning	<p>What you learned about the client system, your methodology, yourself and so on?</p> <ul style="list-style-type: none"> - Academics feedback on role of measures. - Need to highlight difference between initiatives and prototype

Some academics were concerned about the reduced emphasis on the role of quantitative measures. This led the researcher to rephrase the explanation in Section 4.3.2 and Section 4.4.2.2. In essence, quantitative measures are helpful but not mandatory in describing and implementing strategy. One cannot say that without quantitative measures strategy cannot be described or implemented. The simple working definition of strategy in Section 2.1 does not include measures but certainly some **simple measures** are helpful to monitor the **outcomes** of the strategy. This distinction is important for the SMEs with lack of resources and skills to implement elaborate performance measurement systems. More detailed quantitative measures can be added later in Steps 2, 5 and 8 if the need arises.

Feedback (User	Strategy Practitioner	Academic	Policy Maker)
Question			
1. Is the process framework simple to understand ?			
2. Is the process framework simple to implement ?			
3. Does the framework incorporate the important elements of strategy ?			
4. Can you understand The Firm's strategy from the "Strategy by Prototyping" visual template ?			
5. Can you understand The Firm's strategic capabilities from the visual template ?			
6. Do you prefer this visual template over the BSC Strategy Map ?			
7. Is the innovation element obvious in the process framework ?			
8. Is the framework action-biased ?			
9. Is the "Strategy by Prototyping" phrase innovative ?			
10. Will you consider using the DT-BSC framework for your organization ?			
Comments :			

Figure 4.28
Feedback Form

Another feedback was the need to clarify the difference between the strategic prototype and the strategic initiative. Prototypes are simple and informal in the sense that they start before planning and budgeting (sometimes immediately upon conception of an idea) and can use simple tools. Prototypes are dynamic in terms of scope, time and costs. Initiatives are more formal (Figure 4.25). Prototypes may not be suitable for large organizations that need to match formal planning cycles especially for budget approvals. The importance of the prototyping concept in strategy is explained further in Section 4.7.

AR Cycle 7 led to improvements in the final draft of the thesis to further explain the research findings related to the contribution to new knowledge (Section 4.4 and Section 4.7). Thus it achieved its objective to improve the completed DT-BSC framework and to complete drafts of related chapters for the PhD thesis.

4.6 Additional Discussion on DT-BSC Process Framework

The DT-BSC Process Framework is developed based on the evaluation and learning from AR Cycles 1 through 5 together with the researcher's experience in strategy management and the body literature presented in Chapter Two. Table 4.8 highlights the key concepts from strategy management and the DT practices incorporated in the process. Table 4.9 lists some of the gaps and issues related to strategy and SMEs as mentioned in Section 2.1.6 and how the DT-BSC framework

addresses the issues. Thus the process framework builds in key concepts from strategy management, integrates DT practices and addresses some of the known issues regarding strategy and SMEs.

In Section 2.3.9 the design practice of **Connect** is mentioned. Designers are good at synthesizing; taking currently known and available product/service ideas or components and mashing them together in fresh new ways. **This can be a valuable shortcut to innovation for SMEs in particular since they can synthesize and mash successful ideas from other sources in an innovation economy that is more networked and open.** Designers try to think laterally, searching for ideas and trends, and then try connecting ideas that might not seem related. This is a simple enough practice that can also be adopted by managers. The researcher is pleased to note that his approach to **connect and synthesize DT and BSC is an example of the ‘connect’ design practice applied to the area of business strategy.**

The discussions here will focus on how to further support and extend the learning from this singular AR case study so that the framework can be generalized to other SMEs. The first discussion is to confirm that the framework meets the basic definition of strategy. It is then followed by further supporting the steps in the framework from the literature.

4.6.1.1 Framework meets the basic definition of strategy

Figure 2.3 summarizes the working definition of strategy. Clearly the framework has the elements of a company’s vision, core mission and values as articulated in Step 1. The combination of strategic capabilities and strategic prototypes make up the integrated set of choices that are unique to The Firm in achieving its vision and longer-term mission consistent with its CORAL values. These examples are easily extended and generalized for other companies. Table 4.11 presents the other components of strategy shown in Figure 2.3 and how the framework addresses these components. The DT-BSC Framework strongly covers the basic components of strategy related to capabilities and programs. The other components are covered indirectly in the specific details of the strategic prototypes.

Table 4.11
Addressing the Basic Components of Strategy

Choices needed to develop a strategy	DT-BSC Framework
1. What is the economic/business/profit model?	<ul style="list-style-type: none"> - Not specifically addressed - Business model mentioned in Step 2 - Each new business or product idea to be prototyped as in Step 4 and Step 5 is expected to have the profit model
2. Which category of customers to serve, in which geographies and what value to provide for these customers?	<ul style="list-style-type: none"> - CVP mentioned in Step 2 - Each new business or product idea to be prototyped as in Step 4 and Step 5 is expected to have the targeted customer segments and value propositions
3. How do we organize to provide value for these customers?	<ul style="list-style-type: none"> - Not specifically addressed since this differs between companies. If new strategic agenda requires changes in organizational structure, the new organizational structure can also evolve true prototyping.
4. What capabilities to have?	<ul style="list-style-type: none"> - Strategic capabilities in Step 2 and Step 5.
5. What is the portfolio of programs and projects and the timing needed to execute?	<ul style="list-style-type: none"> - Strategic prototypes in Step 4 and Step 5.

4.6.1.2 Supporting the steps in the framework

Although Table 4.8 shows the basic concepts from strategy management that are incorporated into the process framework, this section relooks at the literature review to find research conclusions or findings that are related to the steps in the framework. Table 4.12 presents the findings.

The extracts from the literature and the arguments presented in Table 4.12 further support the steps in the DT-BSC Process Framework. Some of the steps actually help overcome some obvious weaknesses SMEs face in strategy planning and implementation like articulating the core purpose and strategic change agenda. Some of the steps are consistent with some known characteristics of SMEs. It is pleasantly surprising to comment that Step 7 on engaging the customer/market offers opportunities for the SME. Thus the DT-BSC framework adds significant value to the SMEs by overcoming some of their known weaknesses and also offers them potential opportunities.

Table 4.12

Supporting and Relating the DT-BSC Process Steps to the Literature

Findings from literature survey	Validating DT-BSC Steps
<p>- (Collins & Porras, 1994) viewed that perhaps the most significant responsibility of leaders within their organization is to set its direction; the core ideology in terms of values and purpose, and the envisioned future of the firm.</p> <p>- (Stonehouse & Pemberton, 2002) confirmed that a written mission, values and vision statement is positively associated with organizational performance of SMEs.</p> <p>- (Ward, Runcie & Morris, 2009) stressed that even the smallest company or youngest start-up should have a clear vision of their reason for being, their offer, their market and their competitors – and a clear idea of what they want to become on a three or five year horizon.</p>	<p>- Supports Step 1</p> <p>- (Mintzberg, Lampel & Ahlstrand, 2005) consider strategy formulation through a visionary process as the Entrepreneurial School of strategy. This view qualifies the DT-BSC framework as an example of the Entrepreneurial School of strategy.</p>
<p>- (Ghobadian & Galleary, 1996) viewed that it is probably more difficult for SMEs management to recognize the need for change.</p> <p>- (Denning, 2010) said that creating an institutional capability to generate continuous innovation and organizational learning requires a strategic renewal agenda,</p>	<p>- Step 2 presents a simple template to help the SME identify the strategic change agenda, the areas of change that are strategic while identifying the desired outcomes related to these areas.</p> <p>- Step 2 also forces the SME to identify their current and future capabilities, and how it can help find out the ‘white space’ innovation growth opportunities</p>
<p>(McCartan-Quinn & Carson, 2003) argued that coming out with a broad set of formal planning documents is not expected to be positively associated with organizational performance in SMEs. There is lesser need to state a small company’s plans in minute detail at any single point in time. Strategy is expected to guide the successful SME, with informality as a distinctive characteristic, in contrast to the large organization. Only general guiding instruments, like mission statements, and operational documents like short-term, written project plans should therefore offer SME managers more traction in dealing with their strategy implementation.</p> <p>- (Gibb, 2000) viewed that for the SME, the expression of strategy is more likely to be a function of top leadership, organizational culture and direct, informal communication.</p>	<p>- Step 3 on generating divergent ideas uses simple techniques.</p> <p>- Step 4 on converging the many ideas into a list of workable ideas uses simple techniques and criteria on what works due to constraints.</p> <p>- Strategic prototypes connote informality.</p> <p>- Example documentation required is shown in Figure 4.26 to visualize the strategy in a simple one-page format and Figure 4.27 for reporting progress of prototypes. Figure 4.12 can be used to monitor simple milestones and tasks for the prototypes. These are simple and informal reports.</p> <p>- The Firm used its bi-weekly project meeting as the only formal way to monitor the progress of the prototypes so as to add some discipline in the reporting. All others are through informal meetings and discussions.</p> <p>- The Firm also uses informal communication through its Wiki repository and e-mail,</p> <p>- Further supports the need for informal and simple concept of strategy by prototyping.</p>

Table 4.12 (Continued)

<p>Since SMEs suffer from lack of resources, the performance measures should be very simple, synthetic and easily collectable, otherwise the effort needed for measuring would be higher than the benefit gained. Similarly also the procedures for measures collection should be well defined and resource effective. Moreover it would be better to use only a few vital metrics, better if reported in a graphically and visually effective way, in order to enable the manager to focus only on key performance factors and quickly take informed decisions (Cocca & Alberti, 2010)</p>	<p>- Supports the use of simple outcome (vital) measures</p> <p>- Supports graphical reporting as in Figure 4.27</p>
<p>- Visualizing is seen as the dominant sense-making mode of design thinking (Rylander, 2009).</p> <p>- Visualization of intangible concepts (strategy), models and ideas is seen as essential (Drews, 2009; Carr <i>et al.</i>, 2010; Lockwood, 2010a, Liedtka & Ogilvie, 2011).</p> <p>- It is a tool that easily promotes common understanding (Ward <i>et al.</i>, 2009), allowing ideas to be shared and discussed (Junginger, 2007) and most importantly, revealing relationships that are not accessible in verbal presentations or written reports (Sato <i>et al.</i>, 2010).</p> <p>- (Langer & Thorup, 2006) reported on the results of the organizational change process using photographs and brief storytelling for strategic change communication.</p> <p>- (Ward, Runcie & Morris, 2009) report that managers of SMEs welcome the opportunity to interrogate and articulate their day-to-day challenges using different graphical techniques.</p>	<p>- Supports Step 5 on the strategy visual.</p> <p>- Strategy map tool of the BSC fits very well with the visualization practice of DT. Thus the strategy map idea was adapted to visualize strategy (Figure 4.26). It easily promotes common understanding (Ward <i>et al.</i>, 2009).</p> <p>- Most importantly, it reveals relationships (Sato <i>et al.</i>, 2010). Figure 4.26 shows how The Firm's values relate to the strategic capabilities that help implement the strategic prototypes that result in the strategic outcomes consistent with the longer-term vision and mission.</p> <p>- Supports using simple documentation with pictures and PowerPoint slides for communicating strategy. Same approach used in this thesis.</p>
<p>- (Leavy, 2012) specifically mentioned that the transition from design to DT is to empower the user or customer as an active collaborator. Co-creation can apply to any business, large or small, whose customers have experiences and interactions.</p> <p>- (Cocca & Alberti, 2009) viewed that SMEs rely on a limited customer base and are usually closer to the customers and have the possibility to develop more personal relationships with them.</p>	<p>Supports Step 7. SMEs can apply Co-creation. It also suggests that customer co-creation is easier for SMEs.</p> <p>- The Firm used Facebook and their portal for the co-creation by voting example as described in Appendix A.4.3.</p> <p>- Face-to-face meetings with customers were used to develop the customized applications that were then converted to more generic products.</p> <p>- Step 7 on engaging with the customers and market offers a strategic opportunity for SMEs in particular due to their closer relationship with their customers.</p>

Table 4.12 (Continued)

<p>- (Cocca & Alberti, 2009) viewed that SMEs do not have control or influence over the market and thus need to adopt a reactive approach and adapt to market changes.</p> <p>- Almost all the studies highlight scarcity of resources as one of the main problems and typical characteristic of SMEs (Singh <i>et al.</i>, 2008). Due to lack of financial stability and security, resources in terms of personnel, physical assets and managerial time must be managed prudently.</p>	<p>- Support the importance of dynamic actionable strategy by prototyping as in Step 5 and the learning by action as in Step 6.</p> <p>- As such prototyping and testing with the market as mentioned in Step 7 allow the SME to pace the implementation of strategy according to the availability of resources and actual market/customer needs.</p>
<p>- (Pansiri & Temtime, 2008) mentioned that SME success or failure is significantly affected by the managerial and technical competencies of the owner-manager; in fact, decisions are mainly based on the owner-manager's personal skills and intuition rather than on analysis of information.</p>	<p>- Confirms that quantitative measures may not be important for SME owners.</p>
<p>- The owner-manager usually focuses on solving short-term problems and not engaging actual strategic planning (Hudson <i>et al.</i>, 2001).</p>	<p>- Supports the importance to move quickly from strategic planning to implementation and thus the importance of strategy by prototyping so that it becomes a group of activities and tasks that require attention.</p>
<p>- Improvements are usually incremental and there is a preference to adjust processes and systems in response to specific identified needs and to learning-by-doing approaches (Garengo <i>et al.</i>, 2005).</p>	<p>- Supports Steps 5, 7 and 8 that SMEs prefer the learning-by-doing approach.</p>
<p>(Singh <i>et al.</i>, 2006) concluded the obvious that SMEs should be flexible in developing their strategies.</p>	<p>- Supports Step 8 as a specific step in the process for the SME to iterate Steps 5 to 7 and flexibly adjust the strategy from learning through mistakes and feedback.</p>

The researcher also compared the DT-BSC Process Framework for developing and implementing strategy for SMEs, with a general strategy management process for large organizations (Kaplan & Norton, 2008; Palladium, 2010). The purpose is to identify any important missing steps in the process. Figure 4.29 summarizes the comparison.

The 'core purpose' concept is rather established in strategy management literature and applies to large organizations and SMEs. The DT-BSC framework adapted the strategic change agenda and strategy mapping ideas from the works of Kaplan and Norton (2004, 2008) and thus the comparison is obvious. Kaplan and Norton (2008, p. 35-101) discussed many elaborate techniques and steps on strategy analysis and formulation, it finally leads to a list of strategic issues with detailed themes, objectives, measures and targets that represent what the organization wants to accomplish.

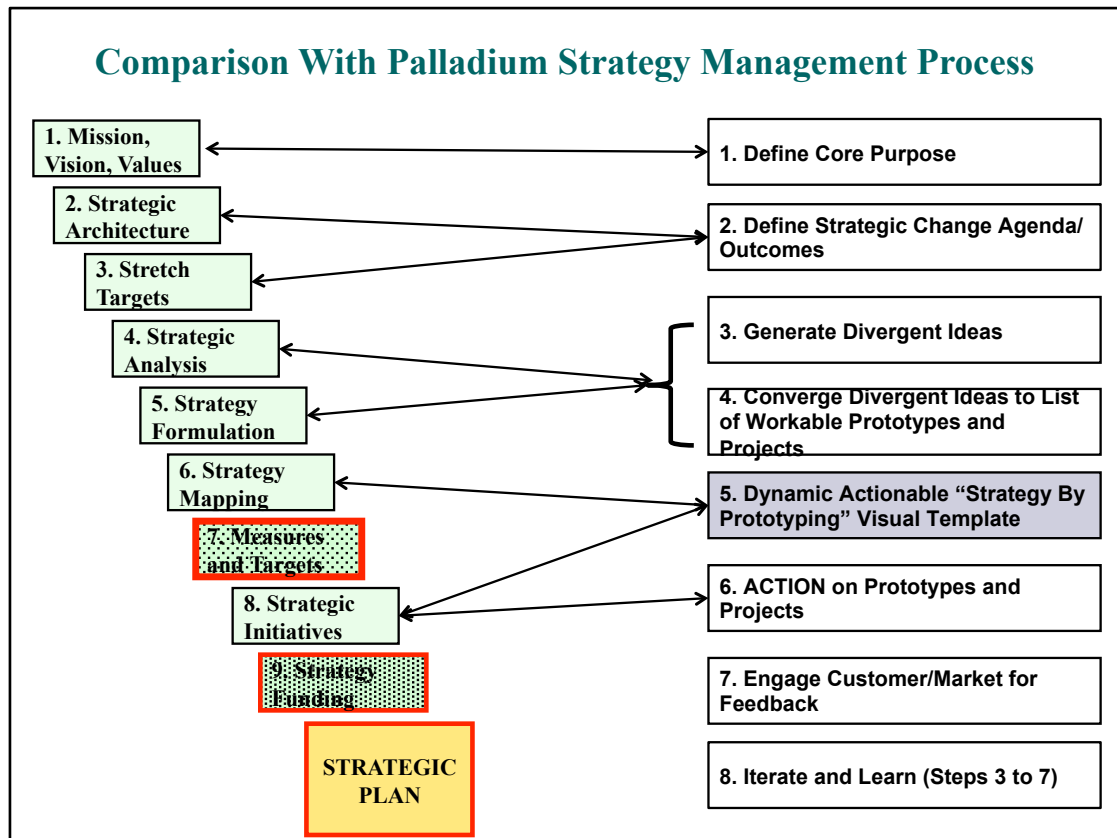


Figure 4.29

Comparison With Palladium Strategy Management Process

Strategic initiatives represent the how or the force that accelerates an organizational mass into action. The DT-BSC framework combines the DT practices of convergent and divergent ideation, prototyping and learning by action with the market/customer, to focus the organization on a list of strategic prototypes. Prototyping connotes faster action on the strategic ideas with a simpler and less formal approach. The ‘strategic initiatives’ concept involves more formal and elaborate processes that ties with budgeting and resource allocations that are suitable for large organizations (Kaplan & Norton, 2000, p. 103-123).

The DT-BSC framework is not against the use of quantitative measures and targets but takes a pragmatic need-based view towards its use while being consistent that the measures must be simple to obtain. As such it does not highlight or insist on defining measures as an important step in the process framework. Measures can be incorporated in Step 2 to quantify the change agenda (Figure 4.17) and Step 6 on the criteria to evaluate the progress of the prototypes. Formal strategy funding and strategic plan documents are needed for large organizations but less so for SMEs.

This comparison with a well-documented strategy management process shows that the DT-BSC process framework covers the important steps in strategy management while being flexible enough to incorporate other detailed techniques and steps. Steps 1 to 4 essentially cover ‘the what’ of strategy and steps 5 to 7 cover ‘the how’ of strategy. Step 8 ensures that there is dynamic learning during the execution so that adjustments can be made to ‘the how’ while maintaining the strategic change agenda and the longer-term vision and mission.

This section deliberates in detail the steps in the DT-BSC Process Framework and references it with findings from the literature to further support its general applicability for SME strategy development and implementation. It also compares the framework with an established strategy management process for large organizations. The discussions and evidences help **conclude that the DT-BSC Process Framework developed using a single AR case study, addresses the basic components of strategy and the various process steps are consistent with the findings in Chapter Two.**

4.7 Strategy by Prototyping

Figure 4.14 and Figure 4.26 highlight the strategy by prototyping concept. As explained in Section 2.1.1, the portfolio of programs and projects and the timing needed to execute them is a core component of strategy. These are the action items that determine the drivers or ‘the how’ of strategy. Implementing these action items means implementing strategy.

Kaplan and Norton (2008, p. 103-123) and Palladium (2010, p. 2.68-2.80) term these portfolio of programs and projects as ‘strategic initiatives’ and discuss the related processes in detail leading to ‘strategic funding’ and linking it to corporate budgeting. Although these processes are thorough and perhaps necessary for large organizations, the initiatives get stuck in the planning process for some time. The researcher has experienced this with the many organizations he worked with on implementing the BSC over the last 10 years. Timely and fast execution of strategy is important to take advantage of opportunities and trends that change dynamically in many industries like technology, trading and retailing. Thus there must be a concept or practice that can force a simpler, faster and more action-oriented approach toward implementing the ideas and projects needed to execute strategy. This practice must

also allow dynamic adjustments to the action projects through learning by doing. In this AR study, the researcher found this simpler approach from the **core DT practices of prototyping and iteration**.

Strategy becomes actionable immediately by working on the simple prototypes. The focus on action is through prototyping and iteration. In Section 2.3.6, the development cycles of the iterative approach are described as **systematic and rapid**. Early and continuous prototyping is seen as necessary and beneficial throughout the entire process; **in fact, Brown (2008) says that it must be done from the first day**. Prototypes **facilitate thinking** and knowledge creation by means of idea formulation and demonstration, to **help the exploration of numerous possible solutions** and to **make concepts concrete**. Liedtka and Ogilvie (2011) maintained that rapid prototyping reduces the risks of growth projects. Some of the findings about the features and advantages of prototyping as highlighted above, show that prototypes can offer many advantages as a concept and practice in implementing strategy. This led the researcher to propose the concept or approach of ‘strategy by prototyping’ as highlighted in the DT-BSC Process Framework (Figure 4.14) and the ‘Dynamic Actionable Strategy By Prototyping’ visual template (Figure 4.26). Figure 4.26 clearly highlights the important role of ‘strategic prototypes’ as the action glue that binds the values and strategic capabilities with the desired outcomes of the strategy.

The view that prototypes must be done from the first day suggests a major shift in the approach towards taking action on ideas and projects of strategy. They can be prototyped immediately thus forcing strategy execution to start immediately. If the ideas and projects represent the force from Newton’s Second Law to move the organization toward change, strategic prototypes represent the push to start the force. The experiences of The Firm confirm that some of the ideas related to the e-book roadmap in Appendix A.4.2 and the voting on book cover designs as shown in Appendix A.4.3 were converted into tangible prototypes almost immediately.

It is important to reproduce again some of the learning notes from AR Cycle 3 (Table 4.3).

- Prototyping works. It quickly turns ideas into tangible solutions/products that can generate feedback.

- Strategy is really about doing and action. Tangible outcomes from strategy and planning workshops (Cycles 1 and 2) make people believe that the strategy is being implemented.
- Strategy development and implementation by prototyping gives real tangible results since there is feedback and progress
 - action and outcome oriented
 - fast
 - staff engaged in strategy by doing
 - use existing capabilities in simple project management
 - no hard measures or KPIs involved
- Coins simple term '**Strategy by Prototyping**' by linking strategy to the two DT practices of prototyping and iteration. What needs to be really monitored is the progress of the prototypes, not hard numerical measures or KPIs.

The term 'Strategy by Prototyping' was coined earlier during AR Cycle 3 and supported through analysis of the literature review in Cycle 6 and now discussed in the context of a new contribution to the body knowledge in business strategy management. It shows how the PhD thesis writing AR cycle articulates the learning from the AR cycles as contribution to new knowledge.

Section 2.3.6 mentions that prototypes can be seen as a tool for stimulating thinking and exploring ideas, not just as representations of the products. Thinking by doing refers to the iterative and highly tangible approach favoured by designers. Regardless of the techniques used, strategy development efforts always generate ideas of what the organization wants to achieve ('the what') and what the organization needs to do ('the how'). Prototyping is a highly tangible approach for stimulating thinking and exploring ideas related to strategy. The researcher has made repeated reference to prototyping as a key component in developing his proposed model for strategy management that is simpler and leads to faster action and implementation. This comment from the literature strongly supports the value that the designers' practice of prototyping brings to strategy. It quickly makes the ideas from strategy tangible and leads to faster action and implementation.

Eisenhardt and Sull (2001) proposed that strategy is based on a unique set of strategically significant processes and the handful of simple rules that guide them.

They coined the term ‘Strategy by Simple Rules’. The DT-BSC Process Framework represents the set of strategically significant processes. The SME uses simple criteria to decide on the strategic prototypes and the progress of the prototyping effort as explained in Steps 3, 4 and 6. Strategy is described using the simple visual template (Figure 4.26). The researcher was influenced by this work when coining the term ‘Strategy by Prototyping’.

As a final effort to support the uniqueness of the ‘Strategy by Prototyping’ concept for business strategy, the researcher did a simple Google search on the term recently, showing a surprisingly low number of search results. Figure 4.30 interestingly shows that the US Army recently reported using this concept for combat modelling. The executive summary of the report shows that strategy by prototyping is the core approach for such an important effort to develop and test future combat capabilities (AFMS, 2012, p. 1). It discussed prototyping capabilities and technologies to support the US Army’s future force. It is interesting to note that a large and important organization like the US Army is using many concepts discussed in this thesis like strategy, capabilities, innovation and prototyping in a recently dated document.

The very low number of search results and all of them being mainly related to military strategy applications further convince the researcher that **‘Strategy by Prototyping’ is a unique and new concept related to business strategy management particularly in the context of SMEs**. It borrows heavily from the core DT practices of prototyping and iteration. It emphasizes that strategy must and can be executed immediately and dynamically adjusted based on the learning from the prototyping progress. It also makes strategy quite simple; determine the ideas that are considered strategic, start prototyping the ideas and advance the prototypes based on customer or market feedback. At this stage, strategy is being executed and implemented. When the prototypes start to generate real business results like new revenue or tangible improvement targets, that part of strategy is deemed successful.

The discussions in Section 4.6 and Section 4.7 clearly show that the research does make a distinct contribution to new knowledge. It proposes a **new DT-BSC process framework for business strategy management** based on a **new concept of ‘strategy by prototyping’**.



Figure 4.30
Results From Google Search

4.8 Comments Related to the Research Objectives and Other Research Issues

The other objectives for this research, derived from the research problem and questions, are summarized in Table 4.13 together with other minor research issues that have been mentioned in Chapter One and Chapter Two. Table 4.13 comments on these issues or points out where they are being addressed in this chapter to avoid repetition.

Table 4.13
Summary of Related Research Issues

Research Objective/Issue	Comments
To propose a simple visual framework that may help SMEs in strategy.	Discussed in Section 4.4.
To document and study the benefits and challenges of blending DT and BSC to implement a strategic renewal agenda.	<p>The primary benefits relate to the increased innovation capability, better ability to develop and implement strategy and enhanced financial performance as discussed in Section 4.2.</p> <p>The challenges will be discussed in Section 4.10 on the critical success factors (CSF) of the project and implementing the DT-BSC Process Framework.</p>

Table 4.13 (Continued)

To document and study the results of an intervention program to increase the innovation capabilities of the case company.	This is discussed in Section 4.2.
To understand how to apply the BSC-DT framework in the SME sector broadly.	This is discussed through the 8 steps in Section 4.4.2.
To contribute lessons learned and observations in developing and implementing a new strategy management framework.	<p>The initial lessons on the importance of strategy development content like core purpose, CVPs, strategic capabilities and white space innovation have been covered in Sections 4.3, 4.4 and 5.2.2.</p> <p>Section 4.10 on the CSF will cover the implementation part.</p>
To contribute a successful case study that aligns with the overall vision of the Malaysian SME Master Plan of creating a new breed of SMEs that are globally competitive (SME Plan, 2012)	The Firm is now a participant in the global Internet and mobile commerce with products in the Apple and Amazon economy ecosystems making it globally competitive. It also is a successful case study of how an SME on the two growth Levers for SMEs; innovation and technology adoption, and HC development.
Section 1.4 mentions that the case study will also incorporate three elements in their strategy; innovation, increasing the export component of The Firm by tapping into the growing global mobile commerce and capability building.	<p>- Section 5.2.1 addresses the first and third elements. Capability building is also highlighted in the strategy visual (Figure 4.26).</p> <p>- Section 4.2.1 discusses the results of the mobile commerce strategic idea.</p>
Section 2.1.2 mentions that the CVP together with the profit model can be simplified to mean the 'what' of strategy. The final three components of the proposed working definition of strategy address the 'how' of strategy.	The strategy visual (Figure 4.26) clearly reflects the balance between 'the what' (mission, vision, strategic outcomes) and 'the how' (values, strategic capabilities, strategic prototypes) of strategy. The DT-BSC Process Framework also balances the development and implementation of strategy.
Section 2.1.4 highlights that one of the most effective means of achieving competitive advantage is by using the company's 'competencies' or 'capabilities'. Successfully integrating these capabilities to deliver the CVP is the essence in determining a company's strategy.	<p>- DT-BSC Process framework is explicit on capabilities (Figure 4.26). Role of CVP and capabilities are highlighted in Step 2.</p> <p>- This again supports the related steps in the Framework.</p>
<p>Section 2.1.4 discusses HC as the real capital that all SMEs have in common and the know-how is usually held by the owners and senior managers of SMEs.</p> <p>SMEs should develop a unique set of capabilities. The unique nature of the knowledge and skill sets of owners and top managers makes them a likely source of organizational differentiation. This makes developing core competencies and capabilities as the key strategy development approach for SMEs.</p>	<p>- The DT-BSC Framework deliberately stresses the role of strategic capabilities (Figure 4.26).</p> <p>- This research confirms the importance of HC as the real capital of The Firm.</p> <p>- DT was new even to the owners and managers of The Firm but they decided to learn together with the staff and try the new management idea. This willingness to try new ideas is consistent with one of the mission statements of The Firm.</p> <p>- This is also discussed as part of the success factors in Section 4.10.</p>

Table 4.13 (Continued)

<p>Section 2.1.5 mentions that for SMEs to be more competitive they need to develop and implement strategy successfully. SMEs are also not following any comprehensive framework for developing their strategies and quantifying their competitiveness.</p> <p>This section also commented that on the export front, SMEs are facing many constraints due to their limited resources and lack of innovation in capability development.</p>	<ul style="list-style-type: none"> - DT-BSC is a complete but simple and action-oriented framework for strategy management and developing competitiveness through strategic capabilities. The Firm applied the process and was able to develop and implement its strategy successfully and become more competitive. Thus this major gap on strategy for SMEs is comprehensively addressed. - The Firm experienced this in the beginning but managed to overcome it with better innovation through DT practices. - Section 4.2 discusses The Firm's experience with the global export market but using e-commerce and mobile commerce.
<p>(Kerr, Way & Thacker, 2005) asserted that small firms with active strategic planning and communication are expected to out-perform those without, with many of the formal techniques associated with the process, being key concerns. Resources, both financial and managerial, are often simply not present in sufficient depth in the SME.</p>	<ul style="list-style-type: none"> - The results (Section 4.2) also confirm the findings of (Kerr, Way & Thacker, 2005). - The Framework focuses on simple outcome quantitative measures. Other driver measures involve more effort and resources. - Also the Framework uses simple reporting formats (Figures 4.12, 4.13, 4.27). - Framework proposes simple but powerful concept of 'Strategy by Prototyping' to address resource constraints.
<p>Section 2.3.1 discusses the difference between invention and innovation. Innovation is when a need is identified and a product or service is developed to meet that need. In business, innovation happens when a product or service is developed to meet a market need or a paying customer's need.</p>	<p>The researcher is pursuing the path of innovation to address the defined research problem. All of the strategic prototypes shown in Figure 4.26 are not inventions, not even the e-book project highlighted in this thesis. But relative to The Firm, these are new and are developed to meet market needs or paying customers' needs. Appendix A.4.2 shows the growing e-book industry and for now The Firm is targeting the Islamic e-books segment. The sales generated as shown in Section 4.2.1 confirm that it meets a market need. Thus the e-book project is an innovation in relation to The Firm.</p>
<p>Section 2.3.5 mentions the summary conclusion from (Cross, 2011) that everyone is capable of and does design; that designing ability has not always been regarded as a specialization.</p>	<p>Although the research is on DT practices and not design, it confirms that DT is not a specific capability as discussed in Section 4.9.1. The managers and staff were trained on DT practices. Prototyping, visualization, project panels are now common within The Firm.</p>
<p>Figure 2.24 shows the first effort to integrate BSC with design management. The researcher planned to follow-up on this effort and integrate DT with the newer components of the BSC like Strategy Maps and Strategic Initiatives.</p>	<p>This was first done in Cycle 5 with the results shown in Figure 4.11.</p> <p>In Cycle 6 the researcher proposes the alternative concept of Strategic Prototypes as shown in Figure 4.26.</p>

4.9 Some Practice Notes on DT

In this section some of the findings in Section 2.3 related to DT are discussed based on the researcher's observations throughout the first four major AR cycles and the minor product development cycles.

4.9.1 DT and Core Competencies

Section 2.1.3 confirmed that generic organizational capabilities have a positive impact on strategy deployment and on the achievement of overall performance. A further analysis comparing the emphasis on generic capabilities by both high and low performing firms found that high-performing firms emphasized capabilities to a far greater extent than low-performing firms. This implies that generic capabilities can be one of the main drivers of performance for SMEs. This is of related importance to this research since it studies the contribution and impact of DT practices in an SME. DT can be both a generic and specific competency. It is generic when applied to strategic planning and specific when applied to product development that involves clear design aspects like graphics, user-interfaces and book cover designs; all of which are reported in this study. The main focus in this study looks at DT practices to build innovation throughout The Firm as a generic capability. **The results achieved confirm that treating DT and innovation as generic capabilities positively impact strategy implementation and overall performance for SMEs.**

Design is a specific capability and its contribution to SME capabilities and performance is reported by (Borja de Mozota & Kim, 2009; Ward, Runcie & Morris, 2009). Although not directly related to the research question, The Firm hired graphics designers for the e-book and other software projects that contributed to its success, thus confirming the findings.

Section 2.1.3 also discussed the static and dynamic views of competencies. The static view suggests that firms need to acquire competencies externally, while the dynamic view suggests that it can be developed internally.

The Firm developed the DT capabilities internally since the practices are simple enough to learn and improved through practice. DT practices are dynamic as generic capabilities when applied to strategic planning. **This study confirms the finding that DT practices used for strategy are considered dynamic capabilities that are developed through internal training** as reported in AR Cycles 1, 2 and 4.

DT practices however are static as specific competencies when applied to product development. The Firm hired graphics designers for the e-book and other software prototypes thus confirming the view that hiring creative design personnel is more appropriate when design is a static capability.

DT practices are generic and certainly more dynamic compared to creativity related to product design. Thus the choice of training and development of DT within a company and its integration with selected business processes should provide a unique competitive advantage for the company. This new observation, in relation to the discussion on core competencies, **proposes that DT practices are mainly generic and dynamic capabilities.**

Interestingly and of great relevance to this research is the concept of the four powers of design (Figure 2.24). Using this reference on design management as a guide, the researcher finds that adopting DT practices as generic capabilities led DT to show its powers as an integrator and transformer.

- i. DT as coordinator or integrator, provides an internal competitive advantage that comes from a unique, invisible, and difficult-to-imitate combination of organizational processes and resources
- ii. DT as transformer or as a resource for creating new business opportunities, for improving The Firm's ability to cope with change and as an expertise to better interpret the company and the marketplace.

The Firm adopted DT practices as a process integrated with strategic planning, product development and process improvement and also as a core capability.

Borja de Mozota (2010a, 2010b, 2011) later on provided more detailed work in linking her proposed concept of design management to core competencies. Adopting DT practices as core capabilities helped The Firm develop and implement new strategies. Design practices now become a capability, a tool in the knowledge system of The Firm that gives it a strategic advantage similar to a competitive differentiator as encouraged by (Porter, 1987). This research confirms the findings of Borja de Mozota but in the context of DT.

(Borja de Mozota & Kim, 2009) viewed design management as a competence that comes under the umbrella of innovation management. Companies that invest in design tend to be more innovative and profitable, and grow faster than companies that do not. The results in Section 4.2 confirm that by investing in adopting DT practices The Firm became more innovative and performed better financially.

Without the DT practices of ideation, prototyping and co-creation, the strategy to participate in the growing e-book business would not have been successful.

(Borja de Mozota & Kim, 2009) mentioned studies also show that companies that deploy design on a strategic level, or as an internal process, are quicker to come up with new products than companies that do not have a design policy in place. Appendix B shows pictures of new products and solutions being developed in The Firm for the new financial year after the strategic planning period reported in this thesis. It confirms that The Firm can now identify and develop products and solutions quicker than before but no comparison is made with competitors. Understanding DT as a resource capability and a way in which to build sustainable competitive advantage has made the scope of DT broader and more process driven than it would be if it were used on a project-by-project basis.

Managing design as a core competency is a high-risk venture and requires a long-term vision (Borja de Mozota & Kim, 2009). As explained earlier in this section, The Firm focused on DT practices as generic capabilities and not design as a specific capability. Managers and staff can be trained on DT practices rather inexpensively and thus significantly lowering the risks. The Firm understood that building a sustainable, competitive advantage requires adopting a long-term core competence view of DT in order to improve the probability of success. A competence refers to an asset or input to production that an organization owns, controls, or has access to on a semi-permanent basis (Section 2.1.4). Managing DT practices as a core competence emphasizes the importance of the invisible internal assets such as the skills and values that permeate throughout the company.

(Borja de Mozota, 2011b) introduced the concept of the three-tiered design ladder for measuring design position and knowledge in companies.

- i. Design understood as style in the first level
- ii. Design as process at the second level
- iii. Design as strategy on the top level

These levels of design relate directly with the three levels in the innovation ecosystem; innovation of product, **process, and business model**. Although this concept is related to design, the researcher notes that in this case study The Firm adopted DT practices **at the strategic level, where DT skills and practices also become resources and core capabilities for reinventing new business models**. It confirms that this tier concept can also be extended to relate the role of DT in companies.

Section 2.3.11 mentions the study by (Matthews & Bucolo, 2012) on only two SMEs in Australia in a design intervention program using DT and design methodologies to contribute to innovation activities and improved business performance. They reported that in terms of (Fleetwood, 2005) four levels of innovation, both firms described moving from design as a process level to design as strategy. In this research, The Firm moved from no DT to using DT for strategy with a focus on innovation. From this observation, the researcher notes that **using DT as strategy may not require any prior experience in design or DT.**

4.9.2 DT and Costs

From the experience in the major AR cycles and the product prototypes, a major learning practice note is when do the prototyping iterations stop? The prototypes and its iterations involve costs. As mentioned in Section 2.3.11, the most glaring element that is missing in DT is the element of cost and the cost issue is not discussed in many DT references. The cost element must be particularly considered when DT practices are to be introduced to SMEs especially in relation to strategy.

It is important to develop some simple criteria to stop the prototyping and abandon it entirely or adapting the prototype with new deliverables and milestones. The criteria may include:

- i. exceeding the budget;
- ii. not meeting project schedules;
- iii. people resources not available or busy;
- iv. not meeting business criteria like minimum revenue;
- v. negative customer or market feedback.

Obviously the core person or team responsible for the overall strategy implementation must review with the assigned project leaders on the action progress of the prototypes and projects and make the relevant decisions. The key activity is to act on moving the projects and prototyping iterations and to learn from the problems encountered. Inaction on a strategic prototype often indicates there are major problems that require drastic action. Liedtka and Ogilvie (2011, p. 205) briefly mentioned about ‘Success Metrics’ as part of the design brief in product development. The cost factor can be incorporated into the success metrics.

Having said that, prototyping may not be suitable for fixed-time and fixed-cost projects because it is difficult to estimate the budget, resources and time required to complete the iterative prototyping process.

In the researcher's analysis the most glaring element that is missing in DT is the element of cost. This practice note on the cost element is a useful contribution for companies in implementing DT practices.

4.10 Critical Success Factors

Obviously there are factors that have contributed to the success of The Firm in implementing its strategic change agenda through the use of selected DT practices that are new to The Firm. In this section, the researcher will discuss these factors to confirm some of the findings from the literature review.

The foremost factor must be the **leadership commitment** to change as exemplified by the SME owners. The drive to invest in new improvement programs is influenced mainly by senior management, regardless of firm size (Schroder & Sohal, 1999). Kaplan and Norton (2000) highlighted that leaders drive strategy execution. O'Regan *et al.* (2005) noted that the success of small firms is generally attributed to the managerial skills, training and education, and the personal background of the SME's leader(s).

In the innovation context, leadership and vision appear to be the principal moderators of all other components of innovation capability (Verganti, 2009). Leaders must be able to visualize the future and to share and communicate a vision of the firm's positioning which inspires and motivates the whole organization. Section 2.3.2 mentions the leadership role in nurturing innovation within a firm, the first of which is providing a long-term view for innovation via the innovation strategy and portfolio. The Firm took a long-term view of innovation by developing innovation as a generic strategic capability through the adoption of DT practices.

Specifically related to design intervention programs, (Brazier, 2004) and (Ward, Runcie & Morris, 2009) confirmed that the take up of design is a leadership issue. The realization that design matters to a company has to come from the highest level to be effective. To persuade the SME of the value of design, the owner or managers must be the first targets. SMEs must show they can and will invest significantly in design capability and that senior management will be integral to the process so that

strategic decisions can be made quickly. Many initially assume that design will help them restyle or rebrand but they discover that it can reorganize their product range, redefine strategy, reduce costs or open up new markets. The researcher notes that although the findings are for the role of design, it lends support that for DT practices to bring about strategic change in an SME, leadership commitment is a must.

SME success or failure is significantly affected by the managerial and technical competencies of the owner-manager (Pansiri & Temtime, 2008). It will certainly help if the owner has strategic planning, project management or DT capabilities. For The Firm, the owner is well experienced in strategic planning and one of the core team members of the change team is PMP certified. However, none had DT or design or innovation capabilities. Mercer (2012) surveyed 663 organizations in 2012 across the Asia Pacific region to gain insight into the current state of leadership strategy and mentioned the leaders critical role in ‘driving innovation’. It may not be important for the SME owner to be innovative but he must drive innovation by following up on innovation related change projects.

Apart from leadership, culture and cultural fit are more important in SMEs than other organizations because an SME is likely to be entirely enveloped in a culture, rather than large organizations, where several cultures may be present (O’Regan *et al.*, 2005). The Firm has a **‘learning by doing’ culture** and ‘Learning’ is one of the CORAL values of The Firm. Prior to this, The Firm also gained practical experience and knowledge of the BSC through learning by doing. The success and competency developed with the BSC launched a new business segment for The Firm on BSC training and consulting. It also helped The Firm improve its capability on strategy management. The learning culture gave The Firm the courage to try the DT practices using internal resources and developing the capabilities through doing, as noted in AR Cycles 1, 2 and 4. The DT practices on its own are quite simple but integrating it with strategy requires some capability on strategy management.

(Ward, Runcie & Morris, 2009) in their work on design intervention programs for SMEs mention **awareness and understanding** as important success factors. The researcher notes that the same applies for DT. Obviously companies must first know that they can gain by adopting DT practices. They must first understand what DT is or what it does, how to start on a DT related project or how to use DT as a competitive advantage. They must appreciate that DT capability can be used as a

tool for business growth. The AR Cycles 1, 2 and 4 intended to create awareness and understanding of DT through practical workshops

The **flat structure** of SMEs and fewer departmental interfaces normally result in a more flexible work environment. With **lesser bureaucracy**, this helps the SME be more adaptable, flexible and quick to respond to the changing markets and customer needs (Garengo *et al.*, 2005). A structure with just one or two management layers favours direct contact with employees, simplifying communication processes and offering to the manager high visibility on the processes and the opportunity to directly influence employees (Singh *et al.*, 2008). Appendix A.5.1 shows The Firm's organizational chart with just one management layer and thus confirming the advantages of a flat structure.

Section 1.3 briefly mentioned The Firm's key **project management** capability from an earlier strategic change agenda. Figure 4.26 also highlights project management as a strategic capability for the current strategy. Obviously having good project management capabilities greatly helps in managing the portfolio of strategic prototypes although prototypes are simpler and less formal and thus may only require simple project management techniques to monitor its progress.

Creating sustainable innovation requires ongoing effort, commitment and understanding beyond that of continuous improvement (Humphreys *et al.*, 2005). Effective innovation must **involve all areas of an SME** with the potential to affect every discipline and process (McAdam, 2000b). Leaders must ensure that **resource allocation** in all areas is appropriate (Verganti, 2009). The Firm deliberately involved all managers and staff involved in the various strategic prototypes to participate in the DT training workshops (AR Cycle 4). The strategic prototypes cover most of the departments in The Firm and some prototypes have cross-department team members. This made the innovation effort through strategic prototyping pervasive throughout The Firm. Appendix A.5.2 shows different forms of 'project panels' used by different departments and project teams to visualize the progress of their projects. It indicates that The Firm involved all departments in adopting DT practices for innovation.

(Ward, Runcie & Morris, 2009) mentioned that in their case studies, all of the design intervention workshop tools and program content was tested with real companies with real business problems. Although the researcher mentions this as the last of the success factors, it is the least obvious. This is why Step 7 is mentioned

separately. True to the design principles of working with users, the prototypes must be **tested with real customers to address real needs**.

Specific to the innovation agenda as discussed in Section 2.3.2, (Skarzynski & Gibson, 2008) showed four independent and mutually reinforcing components that can have an impact on improving innovation within a firm.

- i. Leadership and organization, in providing vision and shared understanding. This success factor has been discussed earlier.
- ii. People and skills, in terms of capabilities, which again has been strongly highlighted in the Process Framework.
- iii. Processes and tools that provide a systematic approach for idea generation, pipeline and portfolio management, for which the Process Framework has adequately addressed in Steps 3, 4 and 5.
- iv. Culture and values that help promote collaboration and challenges the status quo. Interestingly, one of the CORAL values of The Firm is ‘Open Communication and Team Spirit’ that encourages collaboration.

Before concluding this section on the critical success factors of the AR study, it is important to mention that Miller and Toulouse (1986) confirmed and demonstrated that the strategy, structure, decision-making process and performance of small firms were correlated to their CEO’s personality. It is important however to know what aspect of the manager owner’s personality that is related to the success of the strategy. Moreover, this finding confirms the general role of leadership commitment, or in the case of the SME, owner commitment, in making strategy a success.

Leadership commitment, awareness and understanding are well-known success factors in change management and strategy implementation as highlighted in the principles of the strategy-focused organization (Kaplan & Norton, 2000). Project management certainly helps since ‘the how’ of strategy requires managing a portfolio of programs and projects or strategic prototypes, as in the DT-BSC framework. In implementing the DT-BSC framework and realizing the success of the strategic change agenda of The Firm, ‘driving innovation’ and ‘testing with real customers to address real needs’ are perhaps unique. **The most important success factor however is nurturing a culture of practical learning** within the company and the courage to **take risks** by trying new ideas. Bouchard and Basso (2011) quoted many studies, which indicate that when they compete in competitive and dynamic environments, **successful SMEs tend to adopt entrepreneurial approaches, i.e.**

pursue strategies oriented towards innovation, being proactive and taking risks. Garengo *et al.* (2005) reported that within SMEs improvements are usually incremental and there is a preference to adjust processes and systems in response to specific identified needs and to **learning-by-doing** approaches. Thus truly entrepreneurial companies should already have the two important success factors of risk taking and practical learning to adopt the DT-BSC process framework.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Figure 3.2 shows that the actual writing of the thesis is the final AR cycle. This final chapter relates mainly to the evaluation and learning stages of AR. The last two questions in the documentation model used to report on all the AR cycles will be the focus of this chapter. The question related to the evaluation stage is on the lessons learned from the results of the AR project presented in Chapter Four. The question related to the specifying learning stage will mainly lead to the knowledge contributions of this research.

This chapter will also link the key issues raised in Chapters One and Two with the methodology explained in Chapter Three and the results presented in Chapter Four. The objective is to relate how the evaluation and learning from the AR cycles provide greater clarity on the research issues raised and address the gaps identified. The next section presents conclusions related to the overall research problem. Since the major contribution to new knowledge of this research is the DT-BSC Process Framework and the ‘Strategy by Prototyping’ concept, a major portion of the remaining discussion in Chapter Five is to further explain and justify these two major knowledge contributions from the literature review.

5.2 Conclusions

Section 1.4 discussed the overall research problem. This section will discuss the results in Chapter Four in relation to the research problem and presents the relevant conclusions. Section 5.2.1 focuses on the **action** part of the AR and concludes the research problem. Section 5.2.2 focuses on the **research** part of the AR and concludes the research question. Some other objectives and issues related to the research are concluded in Section 5.2.3.

5.2.1 Conclusions About the Research Problem

This research aims to address the problem of how to successfully integrate the practices of Design Thinking and the Balanced Scorecard methodology to implement a **strategic renewal agenda to consciously increase the innovation capabilities**

and **execute the new global business strategy** of a medium sized service-based company. This problem statement parallels the ‘thematic concern’ of the exploratory AR methodology used in this research, ‘**New growth by increasing the innovation capability of The Firm through the use of DT**’. (Section 1.6)

Figure 4.17 describes the overall strategic change agenda of The Firm. There are many components of the strategic change agenda but the research problem focuses only on;

- i. new growth, which refers to ‘Grow B2C’ and ‘Mobile commerce’, through the new global e-book business strategy
- ii. increasing the innovation capability through the adoption of DT practices

Figure 4.1 shows the financial performance of The Firm over the planning period. It confirms that The Firm greatly improved its financial performance and has successfully implemented its strategy by achieving an overall revenue of MYR 56 million, exceeding the target of MYR 50 million as shown in figures 4.7 and 4.17. It also shows growth in revenue from new businesses and employee productivity.

A discussion in Section 2.3.2 separates out measures that relate to the innovation process, innovation skills related to people and leadership, funding and the outcomes of the innovation effort. In line with Figure 4.18 of the DT-BSC process framework, the focus is on the output. From the given examples, percentage of new revenue was chosen, which is easy to calculate. Interestingly, ‘number of projects in prototype’ is also mentioned, and this is also shown in figures 4.23 and 4.26. The number of projects in prototype as a proposed measure confirms the importance of prototypes in innovation. Another interesting measure proposed is ‘percentage of employees trained in innovation’, which in this case refers to the employees trained in DT practices. The Firm was conscious in its effort to train the managers and staff on DT practices as discussed in Cycle 4 and item 10 in Figure 4.23. Skarzynski and Gibson (2008) supports this conscious training effort as a means to increase the innovation capability of The Firm. Although the researcher tries to downplay the role of measures in developing the DT-BSC Process Framework, it is clearly mentioned that measures can be used when they are useful. Obviously it is **best to quantify the outcomes** of any strategic change effort. Here, **simple measures** are chosen to be consistent with the underlying basis that it must be simple for SMEs to use. Revenue growth from new products or services as shown in Figure 4.1 is also the first among the top ten outcome metrics (Mckinsey, 2008) as mentioned in Section 2.3.2.

The results confirm the general findings from the extant literature on the improved performance of SMEs with active strategic planning. The Firm indeed improved its financial performance in terms of revenue, productivity and asset growth. Although the research did not make comparisons with other companies in the same industry, it confirms that developing and implementing the strategic change agenda over the three years has successfully improved the financial performance of The Firm significantly and made it more competitive. The strategy has also positioned it with a significant capability to grow, expand, innovate and introduce new products to the market place (Joyce *et al.*, 1996).

The results also confirm many of the findings in Section 2.1.3 that building strategic capabilities specifically help improve company performance. The literature suggested that **one of the most effective means of achieving competitive advantage is by using the firm's 'competencies' or 'capabilities'**. The research problem specifically mentions that The Firm wanted to increase its innovation capability through the use of DT. Innovation through DT practices led The Firm to generate the ideas shown in Figure 4.23, some of which were successfully implemented resulting in improved financial performance. The innovation capability has also given The Firm a competitive advantage in that it now has a process to quickly translate strategic opportunities into prototypes and progress it toward full implementation. Figure 2.7 shows that capabilities include documented processes, of which the DT-BSC Process Framework is a good example. The researcher deliberately uses the term capabilities rather than core competencies since the latter has a stricter definition as presented in Section 2.1.3. This important role of strategic capabilities is embedded in the DT-BSC Process Framework. The results also confirm that SMEs can successfully identify and develop strategic capabilities that include generic capabilities like innovation and other specific technical capabilities.

Since the research problem also looks at DT, the results also confirm some of the benefits of DT for businesses as mentioned in Section 2.3.6. By embracing design practices and mindsets, The Firm was able to drive and implement new growth strategies. (Cooper, Junginger & Lockwood, 2010) also reported work on DT applied to business strategy, where the focus on DT centers on innovation and business transformation, which involves the discovery of unmet needs and opportunities, as well as creation of new visions and alternative scenarios. The DT practice of ideation led The Firm to discover new strategic capabilities and

opportunities and realize its new strategic outcomes and vision as shown in Figure 4.26. Through the DT practice of prototyping, The Firm has a process of continuously renewing the business using insight derived from customer intimacy and addresses product, process, and business model innovation. The results confirm this as a case study for the successful use of DT in business strategy.

Section 2.3.6 also mentions the contribution of design to increasing innovation, competitive advantage and companies performing better economically. This research particularly focuses on building innovation capabilities using DT practices as a generic capability rather than design as a specific technical competence. However, the DT practices were integrated through the DT-BSC Process Framework as a managed process. The financial results achieved confirm the findings (Borja de Mozota, 2003, 2006a, 2006b; Borja de Mozota & Kim, 2009), that design only strengthens business performance when it is the result of a well-managed process.

Ward, Runcie and Morris (2009) mentioned five key areas where design can help to add value to SMEs – **vision and strategy**, brand and identity, product and service, user experience and **innovative culture**. The results in this research confirm that adopting DT practices helped The Firm in developing and implementing its strategy and to enhance its innovative culture by moving DT practices to center-stage. The idea is to bring DT into the company's premises and to its entire workforce. It is like motivating to make DT practices everyone's job. This was done by engaging managers and teams with games and workshops, assigning team tasks and encouraging different departments to work together. Ward, Runcie and Morris (2009) mentioned example companies have plastered their walls with product and project roadmaps and concept prototypes, thus enabling all employees to see where the company is going and how their own contribution fits into that aim. This also helps to embed a more innovative culture and environment. The Firm's experience confirms this practice as shown by the pictures in Appendix A.5.2.

5.2.2 Conclusions About the Research Question

Section 2.1.5 reviewed the status of current knowledge in the area of strategy management for SMEs. It revealed that the current literature is inadequate with respect to strategy for SMEs, with most of it being case studies of applications of strategy management frameworks developed for large companies (Figure 2.9). This

leads to the main research question as how to develop and formulate a new, simpler and more action-oriented approach for strategy development and implementation for SMEs that integrates DT and the BSC while incorporating features that address some of the gaps and issues related to strategy and SMEs (Singh, Garg & Deshmukh, 2008; Yasin & Gomes, 2010; Rompho, 2011).

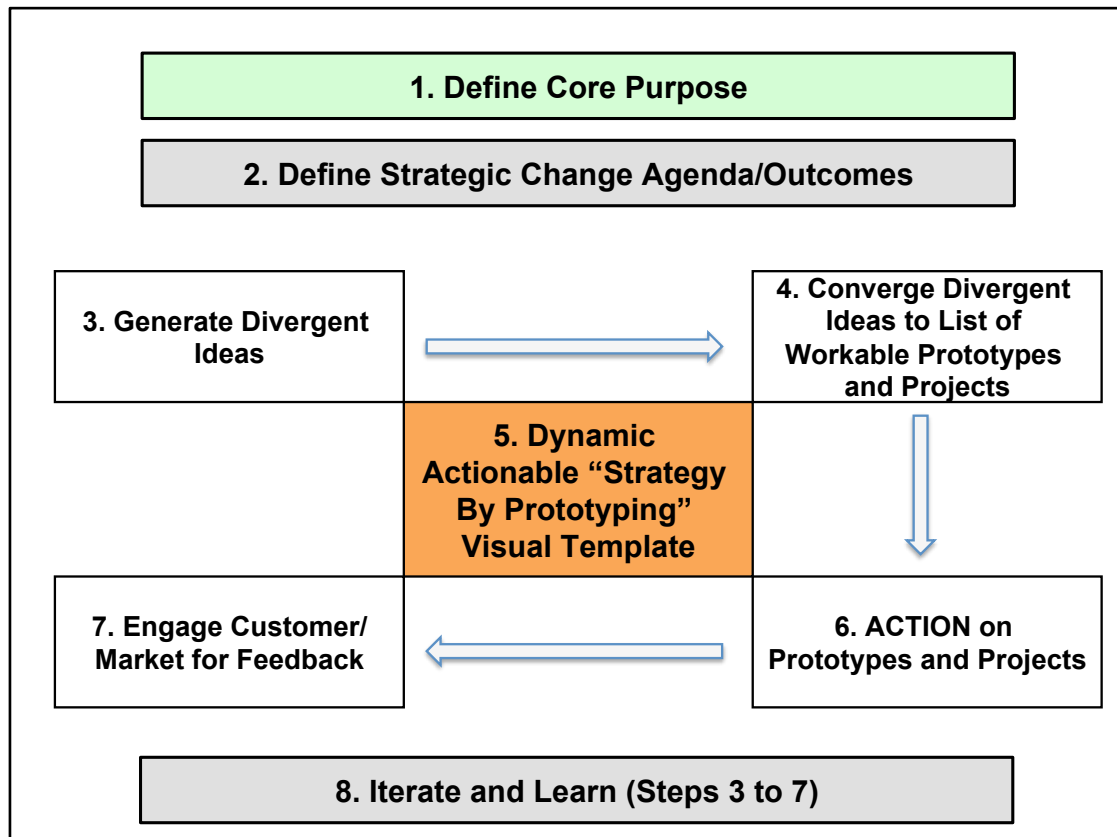


Figure 4.14
DT-BSC Process Framework

Section 4.4.2 explains the new DT-BSC Process Framework (Figure 4.14) and covers the eight steps in detail. The framework uses specific examples from The Firm for each of the steps (Sections 4.4.2.1 to 4.4.2.8) and as such shows what the customized framework for the SME sector looks like through simple figures and pictures. It also explains how SMEs can use the DT-BSC framework without actually having to know the related conceptual constructs.

The process framework is **new** in the sense that it combines DT as a **new** management idea that has only recently appeared in the popular literature (Section 2.3.4) and some **new** developments in the BSC (Field, 2011; Kaplan & Norton, 2008). In Section 2.3.8, the researcher mentioned the work by Borja de Mozota as the first effort to integrate design management with the original first generation BSC model. This new framework however integrates DT practices with some concepts

borrowed from the later works on BSC like strategy maps (Kaplan & Norton, 2004) and case for change (Kaplan & Norton, 2008). The use of the DT-BSC Process Framework for SME strategy development and implementation is also new.

The DT-BSC Process Framework is also able to address all the issues related to strategy and SMEs, as mentioned in Section 2.1.6, and explained in Table 4.9. Addressing the following factors makes the framework **simpler** for SMEs.

- Simplicity
- Resource constraint time, people and skills
- Costs cheap to implement, no consultants
- Informality in documentation, follow-up mechanisms, reviews

Steps 5, 6, 7 and 8 clearly emphasize the importance of **action** in the process framework. It makes strategy actionable immediately by working on the simple prototypes. The focus on action is through prototyping and iteration. In Section 2.3.6, the development cycles of the iterative approach are described as systematic and **rapid**. Early and continuous prototyping is seen as necessary and beneficial throughout the entire process; **in fact (Brown, 2008) says that it must be done from the first day**. The experiences of The Firm confirm that some of the ideas related to book cover designs, graphics and page layouts were converted into tangible prototypes almost immediately. Prototypes facilitate thinking and knowledge creation to help the exploration of numerous possible solutions like different technology platforms for the e-book (PDF, Amazon, Apple iBook, Apple app) and to make concepts concrete. The framework is also designed to be dynamic and timely by adapting from the lessons learned and opportunities that come forth from Steps 5, 6 and 7. All these support the claim that the framework is a new, simpler and more action-oriented approach for strategy development and implementation for SMEs.

As mentioned in the issue related to building innovation within the SME in Table 4.9, the DT-BSC framework helps to enhance the innovation capability through the application of DT practices. Collins and Hansen (2011, p. 223-225) revealed a very interesting research finding from the companies they studied in various industries that performed 10 times better than their peer competitors. These 10X companies that they termed, are not necessarily the most innovative companies but innovative enough to compete within their industry. This framework certainly enhanced innovation within The Firm but did not make it the new Apple or Google.

One important feature of the DT-BSC Process Framework is that it made The Firm more dynamic and adaptable to the needs of the customers and market. By following Steps 6 to 8 and learning through action in the market and customer place, The Firm changed the list of strategic prototypes and also the features of its product and service offerings. It must be emphasized that this is qualitative learning from action data as opposed to quantitative learning from measures and KPIs.

The Firm consciously tried to involve all the staff in generating divergent ideas as described in AR Cycle 1. DT practices emphasize collaboration. From a strategic planning perspective, strategy must involve collaboration among the planners and the doers. Apart from the broad directions established through Step1 and Step 2 of the DT-BSC framework, planners (SME owners, managers or senior staff) should focus on facilitating the other steps. Action happens when the doers buy into the projects they are involved with, and that happens when they get involved in giving ideas and developing prototypes. The core purpose and strategic change agenda form the ‘strategy brief’ like the ‘design brief’. After that, let the doers work and they will have many solutions and prototypes that comply with the ‘strategy brief’.

Table 4.8 and the discussion in Section 4.4.2 show that the DT-BSC Process Framework has a credible knowledge foundation taken from academic books and journals. This is important to qualify it as a contribution to new knowledge. However, as stated in the discussion on the issue of simplicity, the framework does not require deep understanding of its knowledge foundations to implement.

It is important to note that the DT-BSC Process Framework combines strategy development (through Steps 1 to 4) and strategy implementation (through Steps 5 to 8). Implementation is an issue associated with the ideas of the classical schools of strategy. In most of the other schools there is no separation of those responsible for developing strategy from those responsible for implementing it. Implementation as a separate element of the strategic process requires emphasis when the strategies are created by someone (chief executive in the design school, staff planners in the planning school, and analysts in the positioning school) and implemented by someone else (French, 2009d).

The answer to the research question addressed many of the gaps discussed in Section 2.1.5 and is summarized through a simple but comprehensive framework for SMEs to develop and quickly implement their strategies. This framework also overcomes the many shortcomings in existing strategy development methods for use

by SMEs. This framework was developed and documented through a few action research cycles involving a singular case company. The case study also incorporated two elements in their strategy that is of importance to SMEs in general and Malaysian SMEs in particular as discussed in Section 2.4.3. The first relates to innovation and here the research looks at developing an innovation capability based on DT practices as part of the strategic change agenda of the case company. The second element is increasing the export component of the company by tapping into the growing global mobile commerce. This is in line with the vision of the Malaysian SME Master Plan to create globally competitive SMEs and its goal to increase the export share from of the Malaysian SMEs.

5.3 Managerial, Policy and Theoretical Contributions

Section 4.4.2 presents the two main contributions to new knowledge in this thesis; the DT-BSC Process Framework (Figure 4.14) and the concept of ‘Strategy by Prototyping’ for business strategy (Figure 4.26). In addition there are other minor contributions to knowledge and some practice notes.

The detailed discussions in Sections 4.6 and 4.7 clearly show that the research does make a distinct contribution to the body of knowledge. It proposes a **new DT-BSC process framework for business strategy management for SMEs based on a new concept of ‘strategy by prototyping’**.

Other contributions to knowledge will be presented here.

5.3.1 Contribution to the Limited Studies on the Use of BSC by SMEs

The literature reporting on the uses and limitations of the BSC in SMEs is rare (Rompho, 2011). This study has certainly added to the literature example applications of the BSC in SMEs, particularly in the Malaysian context.

Figure 2.9 shows that BSC is designed for large companies. Scaling down the BSC process to meet the limited resources of the SME is expected to face difficulties of compliance with the BSC standards. In this study, The Firm

- i. minimized the use of measures to only simple output measures for the results.
- ii. replaced the initiatives from the BSC with a simpler, less-formal and more action-oriented prototypes.

- iii. did away with the traditional four perspectives in the BSC strategy map and developed its own visual representation of strategy.
- iv. retained the key concepts of balance as explained in Section 4.2.2.

Despite these changes the strategy was successfully implemented.

Figure 2.9 confirms that management frameworks for SME is a major gap. The proposed DT-BSC Process Framework starts with the SME in mind and only insists on the bare minimum of what constitutes a strategy as shown in Figure 2.3. It allows room for more sophistication like specific strategy formulation techniques in Step 2 and more detailed KPIs in Step 5 and Step 6. Although it appears simple and informal, it is action oriented.

This research has enriched the limited studies on the use of BSC by SMEs by investigating the limitations of implementing the BSC in SMEs.

5.3.2 Contribution to the Limited Studies on the Use of DT by SMEs

There is limited work reported in the literature on DT and SMEs (Section 2.3.12). This research has used and studied the application of DT practices in a case SME for strategic renewal and new business models resulting in improved business performance, using the definition of strategic renewal as the “potential to substantially affect long-term prospects of a company, the refreshment or replacement of attributes of an organization and aims to provide a foundation for future growth and development” (Agarwal & Helfat, 2009, p. 282). The researcher highlights the points in the definition above that were achieved. The refreshment of the attributes of the organization is achieved through the improved innovation capabilities and more widespread adoption of DT practices in The Firm during and after the planning period. Figure 4.27 shows that the dynamism of the new innovative culture within The Firm. The improved business performance as shown in Figure 4.1 together with the enhanced strategic capabilities as shown in Figure 4.26 has provided The Firm with a stronger foundation for future growth. Appendix B shows some new prototypes after the planning period as a simple qualitative indicator that the strategic renewal agenda was sustainable. The researcher finds the DT practices are easy for SMEs to learn and quite fun to apply, as reported in Cycle 4. It is also relatively cheap to implement except for prototyping using more expensive tools like 3-D printing.

Design is the opportunity for SMEs as discussed in Section 2.3.12. This research shows that SMEs can gain more by adopting simple DT practices but applying it to strategy and building innovation capability.

5.3.3 Contribution to Studies on the Use of DT for Business Strategy

The end of Section 1.4 mentions Fraser (2007) who asserted that design has its highest value when applying it to strategy and business modelling by designing the sustainable competitive advantage of a firm. (Fraser, 2007, p. 67) further commented, **“While this is not yet a broadly embraced interpretation of ‘design’ it is one where the evidence for success is mounting.** While at first this model may seem either radical or abstract, those who discover its advantages find it surprisingly intuitive and practical – just what the business world needs in the face of high-stakes complexities and change.” This AR project has certainly contributed documented knowledge on the use of DT for strategy that is still in its infancy. DT practices like prototyping, visualization, customer co-creation helped The Firm design and implement its strategy as explained in the DT-BSC Process Framework. The Firm indeed discovered that the process is intuitive and practical, leading to rapid implementation. In addition the simpler tools for prototyping are also inexpensive.

The other factor about DT relevant for strategy is that it is tailored to dealing with uncertainty. Strategy is about changing the company to try new approaches, business models, practices and markets that the company has not ventured into. It is a path into the future that involves uncertainty, some puzzles and perhaps some mysteries. No amount of data about yesterday will solve the mystery of tomorrow. The belief that ‘analysis equals reduced risk’ may not be applicable in the face of uncertainty. Using questionable numbers from the past to predict the future has perhaps more risks. The experimental DT approach and knowing how to improve from failure allows strategy to be ‘prototyped’ quickly and tested. The strategic prototypes are then improved iteratively toward success or upon reaching some stop criteria, like not achieving specific outcome targets within a time frame or budget.

In a review on design and DT in business and management education, (Matthews & Wrigley, 2011) noted that the category of programs described as Design as Strategy or Strategy as Design **“is relatively ill-defined and largely under construction,** ... to present a whole of organization approach to design as a

strategic as well as an operational process with the purpose of creating sustainable competitive advantage” (Matthews & Wrigley, 2011, p. 11). This view applies to design and strategy. **Thus this AR project is a significant contribution to knowledge in the use of DT for business strategy.**

5.3.4 Implications for Theory

Figure 1.1 shows that this research covers the intersection of many knowledge areas. It has generated two major and other minor contributions to knowledge as presented and discussed in Section 5.3. The DT-BSC Process Framework directly addresses the research question and is a major contribution to knowledge in strategy management for SMEs. The DT-BSC Process Framework as a strategy management framework for SMEs is the main knowledge contribution of this thesis and makes a significant contribution to the theory of strategy management.

This section aims to show that this research has not only made a contribution to knowledge in the research problem and question as outlined in Section 5.2, but also has implications for the wider body of knowledge, including the parent theories of Chapter Two like strategy management, RBV, innovation and SME management.

5.3.4.1 Implications for Business Strategy Management Theory

Table 4.11 shows that the DT-BSC Process Framework addresses the basic working definition of strategy and as such is a complete strategy management framework by itself. It also compares favourably with established strategy management processes as shown in Figure 4.29. It has its own unique features though like integrating DT practices, highlighting the strategic role of capabilities and prototypes. Thus it qualifies as a contribution to the theory of strategy management in general. Based on the work by Mintzberg, Lampel and Ahlstrand (2005), the DT-BSC Process Framework contributes to the three schools of strategy as highlighted in Figure 5.1.

- i. Cultural – where the strategy selected is largely influenced by the beliefs and values of the organization.
- ii. Entrepreneurial - where strategy formation is a visionary process.
- iii. Learning - where strategy formation is an emergent process based on experience and adaptation.

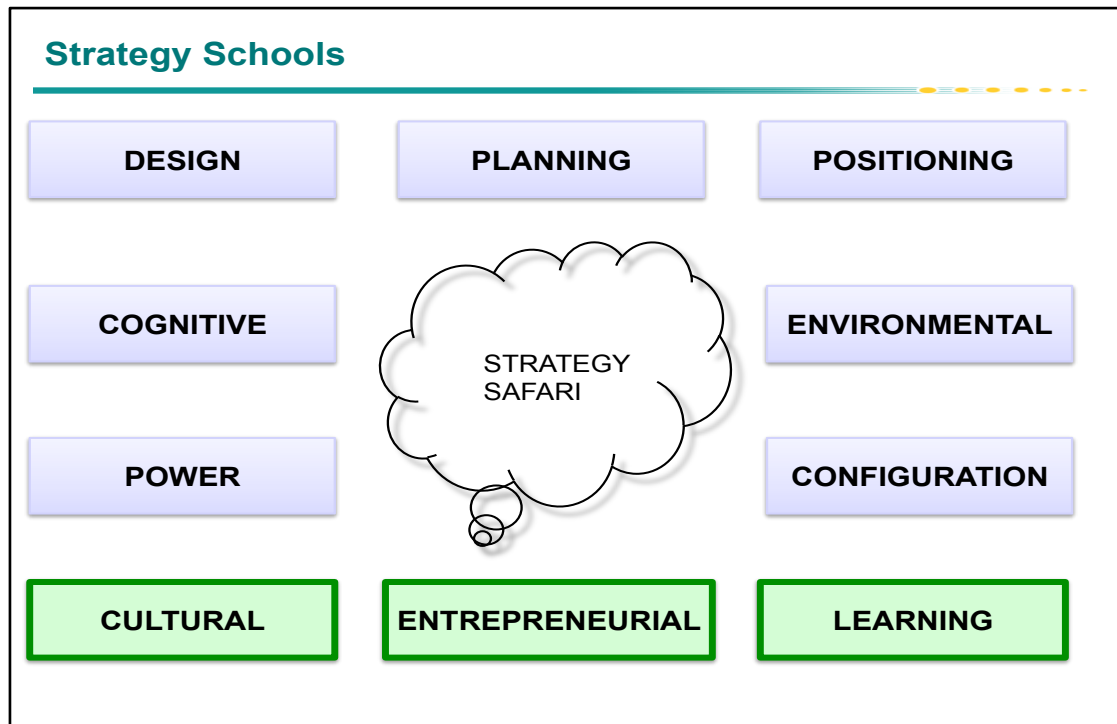


Figure 5.1
DT-BSC Framework Contribution to Strategy Thought

Figure 4.30 shows that the concept of ‘strategy by prototyping’ as espoused in this research is perhaps a new paradigm in business strategy. The US Army is currently using the concept of prototyping for capabilities development. (AFMS, 2012) described in detail the current and future military force development through a “two path approach – concept development and **prototyping**. Concepts, developed and refined through war games and experiments, are the basis for determining the capabilities required for the future force” (AFMS, 2012, p. 8). Clearly this paradigm in business strategy is applicable in large companies since the US Army is a large organization.

Fraser (2007) asserted that design has its highest value when applying DT to strategy and business modelling and suggested that those who discover its advantages find it surprisingly intuitive and practical. The ‘strategy by prototyping’ concept sounds intuitive and is definitely practical. Considering that the application of DT to strategy is still in its nascent stage, it is expected that researching the integration and synthesis of DT and business strategy will contribute to new theories. **‘Strategy by Prototyping’ is a unique and new concept related to business strategy management particularly in the context of SMEs.** It borrows heavily from the core DT practices of prototyping and iteration. It emphasizes that strategy must and can be executed immediately and dynamically adjusted based on the

learning from the prototyping progress. Interestingly, in his bestseller Gladwell (2005) asserted that “decisions made very quickly can be every bit as good as decisions made cautiously and deliberately” (p. 14). This provides further evidence from popular psychology that immediately prototyping a strategic idea can be every bit as good as spending time converting the idea into detailed plans and budgets before execution.

5.3.4.2 Implications for Core Capabilities Theory

The discussion in Section 4.9.1 also mentions a minor contribution to theory related to DT and core capabilities, and by extension, the RBV of strategy. DT practices can take the dual character of generic and specific capabilities depending on how an organization adopts it. The same applies on whether they are dynamic or static capabilities. When DT practices are applied to business strategy they are considered generic and dynamic.

5.3.4.3 Implications for BSC Theory

Although this research borrows some ideas from the BSC, it is not a BSC implementation project. Nevertheless there are some observations that challenge some of the fundamental ideas of the BSC.

Quantitative measures are core to the BSC since it evolved from a performance measurement system. This research discovered that although measures can be helpful, they are not a must for strategy development and implementation. The BSC insists that every strategic objective be translated into a quantifiable measure. This research views that measures are useful to quantify the strategic outcomes or ‘the what’ of strategy but may not be needed for ‘the how’ of strategy. It is much easier and practical to monitor the progress of ‘the how’ of strategy qualitatively since it evolves dynamically and sometimes rapidly.

In Figure 2.15 this research proposes a vital observation about the BSC. Measures describe the objectives quantitatively but strategic initiatives are the real drivers of action that help achieve the objectives. Managing strategy is made actionable by managing initiatives. **As such, one can implement strategy without needing measures but by just monitoring the implementation of the related causal strategic initiatives.** This will greatly simplify strategy implementation and

make strategy actionable since initiatives are tangible programs and projects. It also reduces the time, resources and costs involved in strategy implementation since developing measures and actually producing the quantitative reports do take significant effort. **This observation that managing strategy is essentially managing action programs and projects forms a significant conceptual contribution to strategy implementation.**

The researcher foresees that the future BSC will not have fixed form other than;

- i. some form of balance across different perspectives that makes specific sense to the strategy of the particular organization starting from just simply two perspectives related to ‘activities’ and ‘results’.
- ii. a visual representation of the strategy with components that clearly show what is uniquely strategic to the organization that may include constructs like mission, vision, values, capabilities and strategic projects, but not necessary the traditional generic four perspectives of the BSC.
- iii. some balance between short-term and long-term activities and results that allow the organization to start implementing the BSC and dynamically adjusting the longer term components depending on the lessons learned from the short-term activities and results.

5.3.5 Implications for Policy and Practice

5.3.5.1 Practical implications for private sector managers

The DT-BSC Process Framework is almost a practical step-by-step guide on how to develop and implement strategy for SMEs. SME owners and also strategy practitioners can directly use the framework with some training. Some of the users and strategy practitioners engaged in AR Cycle 7 expressed their interest in trying out this framework.

The Framework can also be useful to develop and implement departmental strategies in large companies since it is simpler and more action-oriented. Company departments typically focus on implementing the corporate strategy by working on departmental improvement projects that are aligned with the overall company strategy and vision. These projects can be simplified into prototypes for product

development, process improvement or new policies. Iterative prototyping promotes rapid action on the projects and helps in faster execution of departmental strategies.

DT workshops are now gaining traction. AR Cycle 4 helped The Firm put together training modules on selected DT practices that can be used to train managers on DT. The researcher has actually used the contents in Sections 2.1, 2.2 and 2.3 for a train-the-trainer programs on strategy management for SMEs.

5.3.5.2 Implications for public sector analysts and managers

In Section 2.4.3, the researcher points out that the Malaysian SME Master Plan (SME Plan, 2012) does not have a design program by itself. The importance of design in general and DT as an emerging management idea in particular, seems not to be in the current mind-set of planners and policy makers for the Malaysian SME industry. Studies have shown that design industry and competitiveness are now considered to be pertinent criteria to be managed and measured in national innovation policy (Borja De Mozota, 2011a). This research could probably contribute to improvements in Malaysian SME policies and strategies by incorporating DT as a competitive technique for Malaysian SMEs

This research documents how The Firm adopted DT practices to increase its innovation capability and implement its new global business strategy. It confirms that adopting DT practices as a new management approach can be rather easily done in Malaysia using local resources. One objective of the Malaysian SME Master Plan is to intensify human capital training programs to meet specialized skill needs. The training modules on DT practices developed and used in AR Cycle 4 can help meet the training needs for other SMEs to increase the innovation capability and skills of selected staff. Furthermore Malaysian SMEs can also be trained and guided to develop and implement simple strategies using the DT-BSC Framework that is locally developed and has been successfully used within a local company. The DT-BSC framework incorporates some best practices in strategy management and thus can help improve the strategic and innovation content of Malaysian SMEs.

Capability building is one of the six levers of the Malaysian SME Master Plan. One obvious missing element is how to encourage SMEs to be more strategic in building their capabilities to compete. The DT-BSC Process Framework helps SMEs identify the strategic capabilities and the strategic prototypes that can help them

achieve their vision. The further development of these strategic capabilities and prototypes often requires funding that usually comes from other organizations chartered to help fund Malaysian SMEs. Funding these strategic capabilities and the strategic prototypes has the potential to make a much bigger impact on the SMEs. This research has shown how an SME greatly benefited from focusing its limited training resources and budgets on building its strategic capabilities.

Some other major factors mentioned in the Malaysian SME Master Plan that is addressed by this research include:

- The overall vision of the plan of creating a new breed of SMEs that are globally competitive wherein this study describes the strategic attempt of The Firm to participate in the global mobile commerce business.
- The plan highlighted the problem of low productivity among SMEs compared to large firms in Malaysia and SMEs in developed countries. SME productivity per worker averaged RM47,000, which is about one-third the productivity of large domestic enterprises. Figure 4.1 shows that the employee productivity of The Firm increased with the implementation of the innovation change agenda. Revenue per employee for 2012-13 financial year is about RM280,000. Thus this study proves that innovation can indeed boost productivity.
- The objective of the plan is also to increase the contribution of SMEs to the economy, which necessitates a transformation to higher value-added activities that are knowledge intensive. This research involves the integration of management ideas like DT and BSC which are knowledge intensive. Also the e-book business and the mobile commerce business are also knowledge intensive and dependent on innovation and design.
- From the plan, the services sector is expected to be the main growth driver of the economy, with its share to GDP projected to rise to 65% by 2020. There will be new challenges and new opportunities for SMEs in the sector. Thus, SMEs must prepare themselves to face the challenges and build their capacity. This research involves a relevant case study in the ICT service sector, mobile commerce and capability building in strategy management and design related innovation.

- One of the measures to track the success of this master plan is ‘Number of innovative ideas supported’ wherein integrating DT and BSC is an innovative idea with many lessons to learn from its actual implementation particularly in an SME context.
- Another measure in the master plan is the ‘Number of SMEs adopting technology’ wherein this case study adopts DT practices, or the soft side of design technology, as an intervention program.
- The master plan summarizes some medium to high value added activities for which SMEs should venture into. Just as suggested in the master plan, the DT practices innovation intervention program involves The Firm attempting to exploit opportunities in higher value-added and more sophisticated market segments like mobile commerce, e-Learning and e-books. Thus this case study will also be a good reference for an SME that is following some portions of the Malaysian SME master plan.

The Malaysian SME Master Plan (SME Plan, 2012) identified six growth levers for SMEs in Malaysia. Innovation and technology adoption is highlighted as the core lever. The researcher notes that this thesis covers DT-related innovation and capability building and thus addresses the innovation and human capital development levers. The researcher purposely highlights this point to show relevance of this research to the current and planned future needs of the SME industry in Malaysia. The earlier argument points to a major gap in the SME Master Plan in not emphasizing the role of design for SMEs as discovered in the literature review.

Thus this research offers theoretical comments and practical ideas that can help improve SME related policies in Malaysia. Furthermore, the case study reported is an excellent example of a Malaysian company meeting many of the objectives of the SME Master Plan.

5.4 Limitations

The obvious limitation of this research is the use of a single case for the study. The literature search confirmed no reported study on the integration of DT and BSC even for large organizations. The closest is the work by Borja de Mozota (2003, 2006) on design management and the BSC. Matthews and Bucolo (2012) studied **only two SMEs in Australia** to find out how firms that participate in a design

intervention program use DT and design methodologies to contribute to innovation activities and improved business performance. Thus the choice of using AR based on a single company is appropriate but it remains important to continue pressing for appropriate rigor in the research. Researchers need to recognize how they treat the very pertinent issue of the generalizability of their research results (Dick, 2000b, 2002). Section 4.6 is dedicated on further supporting the proposed DT-BSC Process Framework that arose from the problem solving AR cycles in this research. It shows that the Framework for strategy development and implementation for SMEs conforms to the basic working definition of strategy and compares favourably with an example strategy management framework for large organizations. Thus the DT-BSC Process Framework as the main contribution to knowledge of this thesis has been properly supported and shown to be generally applicable for SMEs.

The researcher notes that the BSC was developed from a multi-company study and the subsequent follow-up work also used case studies. It is not easy to model a complete framework for strategy management and implementation based only on case studies and postulate that the model can be relevant to all organizations. It is expected that minor adjustments and adaptations must be made when the DT-BSC Process Framework is being implemented for a particular organization.

Likewise, the ‘Strategy by Prototyping’ concept is proposed as a new contribution to knowledge based on comparisons with current literature.

Thus the strengths and contributions of the research to both practice and theory as discussed in Section 5.3 remain since the limitations do not detract from them but merely provide platforms for future research, which are addressed in Section 5.6.

5.5 Reflections on the Methodology

As mentioned in Section 3.1.3, a structured documentation model is very helpful since the AR steps or stages (Figure 3.1) are just too general. The documentation format helped provide clarity to the researcher particularly in identifying the potential new knowledge contributions during the problem solving AR cycles. The discipline and practice to document the AR cycles in a consistent structured manner greatly helps in qualitative learning and research.

An actual version of the schematic diagram proposed by Perry and Zuber-Skerritt (1992, p. 204) is mandatory for a PhD thesis using AR. Figure 3.2 provides

clarity on the major AR cycles required to complete the research and also transition from the problem solving cycles to the knowledge contribution cycles. Obviously the diagram evolved and took the final form when the researcher was clear of the final two cycles required to complete the research.

AR involves learning through action and as such reliability and validity are important considerations. The researcher discovered that pictures, video recordings, PowerPoint presentations, reports, e-mails and even social network postings are sources of reliable information. The work by Ragsdell (2000) and Langer and Thorup (2006) on the contributions of rich pictures, brief storytelling and metaphors on organizational change management can now be easily implemented with the wide availability of mobile phones for taking pictures and the abundance of short postings on social media. Reference to literature is certainly important to validate learning from action. Again the emphasis is on documenting the learning (even in point form) to facilitate comparison with literature. Another approach is to discuss with the relevant subject matter experts as reported in Cycle 4 and Cycle 7. Thus the AR researcher must plan to include these validation steps in the AR cycles..

Generalizability is a key issue in AR since most AR studies can be regarded as case studies. Arguments to generalize the results can be developed through logical analysis, multiple case studies, highly diverse samples or comparisons of its' interpretations with the relevant literature (Dick, 2000b). The researcher took the last approach and argued for the validity and general applicability of the DT-BSC Process Framework (Section 4.6).

The researcher notes the many similarities between AR and DT. Both are action-oriented and involve learning by doing and participation. AR heavily involves collaboration between the researcher and the participants just like the collaboration between the designers and users in DT. The AR iterative cycles are similar to iterative prototypes in DT.

French (2009a) suggested that each AR report concludes with a response to the following six attributes that further distinguish AR from other forms of research; collaboration, problem solving, change in practice, theory development, publication and power.

Collaboration is the interaction between the researcher and the group of practitioners or participants. Here the researcher is considered as part of the core team, working from within to formalize the research with and for the practitioners

thus qualifying for the collaboration to be emancipatory. In this AR project, cycles 1 to 4 involved the same small core group of practitioners and a different broader group of participants that included the staff and managers of The Firm, the prototype team members and invited customers. AR Cycle 5 involved collaboration between the researcher and the customer team. AR Cycle 7 involved significant interactions with the small group participants through discussions and responses to a simple feedback questionnaire. Thus there was considerable collaboration with different groups of practitioners and participants and this led to the delivery of the results reported. The researcher himself however carried out AR Cycle 6.

Problem solving is a primary purpose of AR. The problem is determined as one of the early tasks of the core team assembled by the researcher who has a notion that some aspect of practice might be improved. The core problem was to achieve ‘new growth by increasing the innovation capability of The Firm through the use of DT’. This was addressed through AR cycles 1 to 4. The results presented and discussed in Section 4.2.1 conclude that this problem is adequately solved. The Firm continues to pursue the development of new titles and markets for the e-book business as described in the roadmap in Appendix A.4.2. In fact, in June 2013 the books in Amazon generated revenue. The Firm also added new active strategic prototypes for year 2013 in the list shown in Figure 4.27. These new prototypes continue to implement many of the DT practices like co-creation and learning launch. Also symbols of active collaboration like project panels and simple project timelines as described in Appendix A.5.2 are now common in the Firm. These factors confirm that the improved change in the use of DT practices and innovation capability of The Firm are helping it pursue other new growth opportunities.

Zuber-Skerritt (1992, p. 12) suggested that results and insights gained from the AR should lead to practical improvements in the problem areas identified and a **change in practice**. Figure 4.7 shows the achievement of The Firm’s strategic change agenda over the planning period. All the components of the strategic change agenda showed improvement. It is important to note that improvements in innovation and DT practices are explicitly mentioned in the problem statement. Appendix A.4.1 shows the rate of improvement in selected financial measures.

A fundamental objective of AR is that the researcher utilizes the results achieved through the research process to **develop new theories** or expand existing theories. The evaluation and learning stages of the first five AR cycles provided valuable

qualitative data. The researcher compared these observations with critical reflection of existing academic knowledge and proposed the concept of ‘Strategy by Prototyping’ and developed the DT-BSC Process Framework. Section 4.4.2 describes in detail the DT-BSC process framework for strategy development and implementation suitable for SMEs. Other contributions to knowledge are discussed in Section 5.3.

Zuber-Skerritt (1992) suggested that the theories and solutions produced from the AR process should be made public to the other participants and others who may have an interest in that work setting or situation. This was done through the focus group discussions in Cycle 7 with a conscious effort to cover strategy practitioners, academics and potential users. This thesis is also a **publicly available documentation** of the AR project.

The final attribute is power. **Power** in AR involves the sharing between a group of equal participants. In emancipatory AR, participants are free and encouraged to participate in the AR cycles. Power is located in the group and not with individuals. Here, the researcher was like a moderator of the AR process and knowledge facilitator for the DT practices and other techniques applied in the AR cycles, collaborating and sharing responsibility with the other participants. In AR Cycles 1 to 4, each person in the group was expected to participate in all aspects of the discussion and decision-making. In fact, without their ideas and efforts to develop the strategic prototypes until it matured into revenue generating products or services, the results as discussed in Section 4.2 will not be realized.

5.6 Implications for Further Research

Obviously the next stage of the research is to implement the DT-BSC Process Framework in other SMEs in Malaysia perhaps starting with SMEs in the ICT industry and then covering different industries. Similar research could be done in different countries.

In Section 2.3.8 design is promoted as an intangible asset called Design Capital. This is similar to other intangible assets like human capital, information capital and organizational capital as mentioned by Kaplan and Norton (2004) or intellectual capital (Cuganesan & Dumay, 2009; Edvinsson *et al.*, 2004). Obviously DT

practices help build capabilities that are intangible. A detailed framework approach on how DT practices can create value is another area for future research.

In Section 2.3.8 mentioned the Danish Ladder of Design to indicate the extent to which firms engaged with design and how these criteria are used as the basis of a Design Audit. Using a similar approach for the adoption of DT practices, The Firm qualitatively did a leap from Level 1 to Level 4. A more detailed model for describing the maturity in adopting DT practices is another follow-up research area.

The researcher quoted the works by Gladwell (2005) and Pink (2005) on popular psychology and thinking processes in Section 5.3.4. Table 2.1 describes the mindset category in the discussions on defining DT. This research focused on the practices category of DT. Exploring the mindset and thinking processes related to DT in an SME or small department setting is also an interesting area of future research.

5.7 Final Remarks

Section 2.3.7 mentions that design is increasingly being viewed as a vital and important strategic business resource and consequently companies worldwide look to design to help them innovate, differentiate and compete in the global marketplace. In practice design leads to greater productivity, whether by way of higher-value products and services, better processes, more effective marketing, simpler structures or better use of people's skills. This research focused mainly on DT as a process and practice in business strategy. Design is needed in the prototypes but is not the focus of the study. This study is unique in managing and implementing DT practices and integrating it with a company's business strategy. It studies adopting DT practices as generic and dynamic capabilities.

Brazier (2004) confirmed that design is the opportunity for SMEs. This research shows that SMEs can gain significantly by adopting simple DT practices but applying it to strategy and building innovation capability.

Interest in design and DT at a company level is largely stimulated by the growing recognition of the potential impact of design and its contribution to successful business practice and the popularity of the notion of DT at the business level. Fraser (2007, 2009) asserted that the greatest payout of DT lies in the design of strategies and business models for organizational performance that creates both economic and human value. He visualized this through 3 iterative gears in business

design as in Figure 2.23. It can be the path to understanding stakeholder needs, the tool for visualizing new solutions, and the process for translating cutting-edge ideas into effective strategies. This AR thesis confirms that integrating DT practices with strategy helped The Firm to achieve all the three factors.

The action element of the AR project is completed. The ideas and concepts have been tested and results have been achieved. Changes to practice have been made and a practical framework of strategy development and implementation for SMEs has been developed so that other strategy practitioners may benefit. The research element is also completed and the main research question has been addressed through the DT-BSC Process Framework. In addition to addressing all of the gaps mentioned in Table 4.9, the DT-BSC Process Framework also overcomes the many shortcomings in existing strategy development methods for use by SMEs.

It is encouraging that a relatively new management concept like DT has been successfully applied in relation to strategy and building innovation capability for SMEs. Most of the work as reported here is rather new since such research is only beginning to gather interest. The most exciting outcomes of this research are the contributions to new knowledge as discussed in Section 5.3. In Section 1.4.5, the researcher wrote, “The integration of the practices of DT and the BSC is expected to contribute to new knowledge in the field of strategy management.” This expectation has indeed become a reality. However, the documented knowledge on the use of DT for strategy is still in its infancy and provides much room for study. Hopefully this starting effort will lead to greater contributions in the theory and practice of strategy management, SME management and design thinking.

The three knowledge tracts of strategy, innovation, and design thinking have a paradoxical relationship (Johansson & Woodilla, 2009). On one hand, they are quite separate, with different origins and purposes. Strategy is an executive tract that focuses on long-term goals, resource allocation, and decision making. Innovation is a technological tract that aims to be knowledgeable about bringing new products, services or business models to the market. Design thinking is an emerging knowledge tract coming from architecture, design, and art that strives to understand the character of designers’ sense making and practices. It has recently infiltrated the management knowledge tract. On the other hand, there are similarities among all three tracts. They are all used in both large and small companies when referring to growth-intended strategic work. Also, they are used by top management for

organizational change and thereby as competitive ‘tools’ for growth. This research has explored how to make sense of the separate knowledge tracts, their characteristics and relationships between them. It has provided some theoretical and practical insights on how they might contribute to an integrated knowledge area that is complimentary.

It is obvious that the space where design and strategy meets is an open and interesting area of research. This confirms that the research being addressed is current and advanced. Matthews and Wrigley (2011) state that many of the current programs related to design and strategy are at the post graduate MBA and executive education level. This indicates that the body of knowledge related to strategy and DT is considered post-graduate material. With the added view that the greatest payout of DT lies in the design of strategies and business models (Fraser, 2007, 2009) this research involving DT, strategy and BSC has indeed made a significant contribution to current and important knowledge.

Pink (2005) pointed out “What is in greatest demand today isn’t analysis but in synthesis, recognizing patterns, crossing boundaries to uncover hidden connections and making bold leaps of imagination” (p. 23). This research involving DT, strategy and BSC is a synthesis of established ideas in strategy and the newly popular paradigm of DT. It crosses the boundaries by studying the relationship of the management related ideas from DT with other existing strategy related frameworks and methodologies while applying the emerging patterns to solve a real business problem. The research has uncovered hidden connections that opens up new contributions to the body of knowledge related to strategy management, the BSC, SME management frameworks, innovation and DT, among others.

The practical application of the synthesis of these ideas for an SME has also provided some unique insights. The research contributes to theory and practice by beginning to draw a holistic picture of how DT helps increase innovation in SMEs and shapes the culture to the potential influence of these factors on strategy and innovation. The research will have important outcomes for SMEs that are considering seeking strategic change by using DT practices to encourage innovation. The results show that adopting DT practices helps to build innovation in SMEs. The findings will also have implications for the designers of change programs, change agents involved in the application of these programs and policy developers.

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APPENDIX A

A.1.1 The Case Company and the Researcher's Journey in Entrepreneurship

The researcher has both an academic and professional background before he became an entrepreneur. He was a Physics lecturer in UKM (www.ukm.edu.my) in the 1980s during which he published a fourth year undergraduate textbook, a few seminar papers and one paper in a refereed international journal. He then joined IBM (www.ibm.com) as a Systems Engineer and won a Systems Engineering Excellence Award after just one year. Then a big question came, “Am I doing well because of IBM or due to my own capabilities?” He then took the challenge to lead a local small IT company of about 20 people and grow its revenue by about three times in two years. Then the next big question came, “Can I be successful on my own?” That led him to start his current company in October 1993.

His experiences and capabilities from IBM and the local company were in selling computer hardware. The early 1990s was the growth period of the PC companies like HP (www.hp.com), Compaq (acquired by HP), Acer (www.acer.com) and IBM. It was also the beginning of the client-server computing era with names like IBM, Compaq, HP, DEC (acquired by HP) and Sun Microsystems (www.sun.com and acquired by Oracle (www.oracle.com) in 2011). The researcher recalls that from the very early stages of The Firm, strategic choices had to be made. Should The Firm focus on the PC or client-server computing domain or both? Should The Firm work with all hardware manufacturers or focus on developing strategic alliances with a selected few? Which customer segments should The Firm focus on; consumers, corporations or government? What value-add can The Firm offer its customers? He experienced that even for a start-up firm, strategic choices need to be made and in his case, the experiences and capabilities of the founder shareholders were the only guide. With limited resources, the urgency to go to market and secure sales that lead to revenue and cash, the safest choices were the products and markets that the founding team was familiar with. The experiences and capabilities of the founder entrepreneur greatly influence the early strategic choices that a start-up company has to make.

The Firm was profitable in the first year mainly due to the experienced team that had good relations with both the customers and suppliers, thus growing revenues and

controlling the costs and cash flows well. Upon reaching the first stable phase of The Firm after about 3 years, longer-term strategic questions about the future of The Firm were raised by the founder managers. As his role moved from operations to management, The Firm looked towards the researcher for guidance and leadership on these strategic matters. That started his journey on business strategy.

Being incorporated in October 1993 with a paid-up capital of RM5 million, eNCoral Digital Solutions Sdn. Bhd. is privately held and funded. Trading of computer hardware was the initial core business. Currently, eNCoral is one of the reputable local SMEs in Malaysia that offers software-based solutions and consulting services to customers who intend to transform themselves into fully functional e-businesses. The focused customers are from the education, health, and banking industries as well as Government ministries and agencies.

Since its establishment in 1983, eNCoral has built strong partnerships with world class global ICT corporations such as Oracle and IBM and has employed successful business processes and methodologies. As a result, eNCoral has achieved numerous awards and recognitions from both corporate sector and Government agencies such as Platinum Partner from Oracle 2009-2013, IBM Premier Business Partner 2012, Enterprise 50 and Industry Excellence Award 2003 from Ministry of International Trade and Industry Malaysia (MITI), among others.

A.2.1 Sample List of Technical Action Research Projects

Sample list of strategy related projects commissioned by the researcher.

- Training and consulting for Tenaga Nasional Berhad Ventures Division and Non-Core Subsidiaries (2000)
- Training and consulting for UMW Toyota Sales Division (2001 and 2002)
- Training and consulting for UMW Toyota Human Resources Division (2004)
- Training for Kuwait Petroleum Company (2002)
- Training, consulting and software implementation for Syarikat Air Trengganu (2002)
- Training, consulting and software implementation audit for Qatar Steel Company (2002, 2003, 2004 and 2005)
- Training for Construction Industry Development Board (2005)
- Training and consulting for CIDB Holdings (2005)
- Training and consulting for Alhamrani United Company, Saudi Arabia (2005)
- Consulting for MARA (2005)
- Training and Consulting for Universiti Teknologi Malaysia (2005, 2006, 2007, 2008, 2009)
- Training and Consulting for Atomic Energy Licensing Board (2006)
- Training and Consulting for Malaysian Armed Forces Military Health Service
- Training and Consulting for Qatar Telecom (2006, 2007, 2008, 2009)
- Various projects in using BSC as a tool for IT Strategic Planning. (2005 – 2007)
- Strategic planning and corporate scorecard development for UKM (National University of Malaysia). (2010)
- Full ICT plan for new technology park for USM (Science University of Malaysia) (2010)
- Scorecard automation at corporate and faculty level for UTM (Technology University of Malaysia) (2010)

The researcher has two formal certifications related to strategy management from the creators of the BSC. In 2008, while working as a consultant in the Strategic Planning Department at Qatar Telecom, he participated in the Office of Strategy Management Executive Working Group Program as a team member that included other members from more than 20 organizations worldwide. The two-year program covered detailed assignments related to the nine strategy management processes (Kaplan & Norton, 2008). In February 2011, he formally passed the certification examination and earned the distinction of being a Kaplan-Norton Balanced Scorecard Certified Graduate.

A.3.1 Action Research in Brief

Origins of AR

The origins of AR can be traced back to the work of social scientists both in the USA and in Europe in the late 1940s beginning with the original work of (Lewin, 1946). Kurt Lewin is acknowledged as the pioneer of action research (Abraham, Arnold & Oxenberry, 1996; Daniel & Wilson, 2004; Dick, 2002; French, 2009a; Zuber-Skerrit & Farquhar, 2005). In his work, he was constantly looking for the link between practice and knowledge, the link between the improvement of practice and the production of knowledge.

I have no access to the original published articles by Lewin (1946) and mainly referenced these works (Abraham, Arnold & Oxenberry, 1996; Daniel & Wilson, 2004; Dick, 2002; French, 2009a; Zuber-Skerrit & Farquhar, 2005). The work by Daniel and Wilson (2004) which has some relationship with this work, followed the Lewin (1946) five-phase model and I liked its simplicity. A summary of these original ideas is given in Appendix A.3.2 (Abraham, Arnold & Oxenberry, 1996; Zuber-Skerrit & Farquhar, 2005).

Abraham, Arnold and Oxenberry (1996) and Zuber-Skerrit and Farquhar (2005) pointed out to scholars at Tavistock Institute in the United Kingdom that followed up on Lewin's original work. Some of Lewin's successors also took up the AR approach particularly looking at the relationship of work groups behaviour and productivity of the American industry. So, there were two strong historical streams to AR that exploited it as a more systematic use of case studies giving more importance to the naturalistic ways of researching data such as participant observation, unstructured and semi-structured interviews, field notes, group discussions, workshops, log books and document analysis. There was still the emphasis given to verification, which was long the hallmark of the scientific method, but now this came from a different direction by researchers seeking ways for the validation of their findings. This gave birth to the idea of triangulation in which data were observed, confirmed by participants and tested by documentary evidence or similar means. The data were replicated by different sources of analysis rather than the duplication of the same set of circumstances (Abraham, Arnold & Oxenberry, 1996).

Zuber-Skerritt and Fletcher (2007) in a historical summary on AR for thesis writing described it as a relatively new methodology that focused on empowerment and change, gathering momentum across contexts and cultures. In addition to the social work of Kurt Lewin and his associates, first in Germany and then in America, and the socio-technical experiments and systems developed at the Tavistock Institute, they also referred to participatory AR and its origins in third world countries, especially in Latin America. After a pause in the late 1950s and 1960s, the literature on AR re-emerged in the late 1960s and has expanded greatly since then, especially in the last two decades when the number of higher degree theses by AR has increased.

Five fundamental features of Lewin's AR method emerged (Abraham, Arnold & Oxenberry, 1996):

- i. AR has to be focused on real problems in organizations and communities.
- ii. It involves actually taking action to solve problems or improve the situation.
- iii. The action is often repeated through a spiral of steps comprised of planning, action and evaluation.
- iv. Researchers should collaborate with members of the community or organizations that are the subject of the research.
- v. AR is a scientific process that, in addition to solving the identified problems, can provide insights into new knowledge in the related disciplines.

Defining AR

Langer and Thorup (2006) mentioned that Lewin (1946) described AR as “a comparative research on the conditions and effects of various forms of social action and research leading to social action” which uses “a spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action”. This definition indicates that AR is a significant methodology for intervention, development and change within communities and groups and that AR is about empowerment of these communities and groups

Abraham, Arnold, and Oxenberry (1996) stated that Lewin did not actually publish a complete definition of AR. They mentioned this definition of AR which is

often quoted in the literature on the subject: “Action research aims to contribute to both the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework.”

Dick (1993) defined AR as a methodology with the dual aims of action and research; action to bring about change in some community or organization or program, and research to increase understanding on the part of the researcher or the client, or both (and often some wider community). There are in fact AR methods whose main emphasis is on action, with research as a fringe benefit. At the extreme, the ‘research’ may take the form of increased understanding on the part of those most directly involved. For this form of AR the outcomes are change, and learning for those who take part. In other forms, research is the primary focus. The action is then often a by-product. Such approaches typically seek publication to reach a wider audience of researchers. In these, more attention is often given to the design of the research than to other aspects. In both approaches it is possible for action to inform understanding, and understanding to assist action.

In a later work, Dick (2002) suggested that AR is a family of research methodologies that pursue action through change and, concurrently, better understanding through research. This is achieved by cycles of action and critical reflection and in the later cycles, continuously refining methods, data, and interpretation based on the understanding developed in the earlier cycles. It is a process of emergence that changes and develops as understanding increases. It is also an iterative process that evaluates the path of change as it converges towards a better understanding of what is happening. Most importantly, AR yields simultaneous action and research outcomes because it adapts to the situation. AR achieves adequate rigor by repeating the action and reflection cycles. Each cycle integrates theory and practice, understanding and action, and informs the next cycle until the research problem is solved adequately.

Zuber-Skerritt and Fletcher (2007) commented that it was impossible to arrive at a single, true definition of AR, because it depends on many environmental, situational, personal and organizational factors and multiple perspectives. They mentioned a mutually agreed working definition that is reprinted below. AR is occurring in a situation in which:

- people reflect and improve (or develop) their own work and their own situations;
- by tightly interlinking their reflection and action; and
- also making their experience public not only to other participants but also to other persons interested in and concerned about the work and the situation, i.e. their public theories and practices of the work and the situation;
- and if yours is a situation in which there is increasingly:
- data-gathering by participants themselves (or with the help of others) in relation to their own questions;
- participation (in problem-posing and in answering questions) in decision-making;
- power-sharing and the relative suspension of hierarchical ways of working, in a conscious move towards social and industrial democracy;
- collaboration among members of the group as a ‘critical community’;
- self-reflection, self-evaluation and self-management by autonomous and responsible persons and groups;
- progressive (and public) learning by doing and making mistakes in a ‘self-reflective spiral’ of planning, acting, observing, reflective planning, etc.;
- and reflection that supports the idea of the ‘(self-)reflective practitioner’;

Independently, Zuber-Skerritt (1992, p. 2) developed a theoretical framework of effective AR, known as the CRASP model. She made the clear distinction between research that yields theory/information only, and research that yields theory/information as well as improved practice (action, change). The latter is AR.

- Critical (and self-critical) collaborative enquiry by
- Reflective practitioners being
- Accountable and making the results of their enquiry public,
- Self-evaluating their practice and engaged in
- Participative problem-solving and continuing professional development.

Recently similar efforts have sought to define AR. This is a summary of the essence of quality AR: “AR is a participatory, democratic process concerned with developing practical knowledge in the pursuit of worthwhile human purposes,

grounded in a participatory worldview which we believe is emerging at this historical moment. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities” (Reason & Bradbury, 2007, p. 1).

Abraham, Arnold and Oxenberry (1996) developed the word formula below to identify the features specified by some authors as being necessary components of AR. $AR = G + P + A + F + C + R$; where

- G is the action research group. The group will be members of an organization/community as well as researchers who may be seen as an integral part of the group working in a collaborative manner for change and knowledge development.
- P is the problem to be addressed.
- A stands for action. The group takes positive action in response to the ideas and suggestions generated through questioning and discussion.
- F represents the facilitator.
- C indicates the cyclical nature of action research.
- R represents research/researcher.

Types of AR

There are various types of AR methodologies that might be applicable to different research problems. Zuber-Skerritt and Perry (2002) described three modes of AR as shown in Table A.1. French (2009a) mentioned four types of AR: “experimental, organizational, professionalizing and empowering” and also referred to another four varieties of AR: diagnostic, participant, empirical and experimental.

Zuber-Skerritt and Perry (2002) and Dick (2002) have provided detailed descriptions of what constitutes AR and have differentiated the required processes to be followed when AR is used for academic theses. For the purpose of this paper, the model as cited in (Zuber-Skerritt & Perry, 2002) will be used. Table A.1 summarizes the aims of the facilitator’s role and the relationship between the facilitator and the participants in the three different types of AR.

Table A.1
Types of AR and Their Main Characteristics

Type of action research	Aims	Facilitator's role	Relationship between facilitator and participants
1. Technical	<ul style="list-style-type: none"> - Effectiveness/efficiency of professional practice - Professional development 	Outside 'expert'	Co-option (of practitioners who depend on facilitator)
2. Practical	<ul style="list-style-type: none"> - As (1) above - Practitioner's understanding - Transformation of their consciousness 	Socratic role, encouraging participation and self-reflection	Co-operation (process consultancy)
3. Emancipatory	<ul style="list-style-type: none"> - As (2) above - Participants' emancipation from the dictates of tradition, self-deception, coercion - Their critique of bureaucratic systematization - Transformation of the organization and of its system 	Process moderator (responsibility shared equally by participants)	Collaboration (symmetrical communication)

Technical AR requires the testing of an intervention based on a pre-developed and specified theoretical framework. The intent of the research is to question whether the selected intervention can be applied in a practical setting. The researcher acts as an outside expert who will assist in the implementation of the intervention. Perry and Zuber-Skerritt (1991, p. 77) suggested that the aims of technical AR should be the effectiveness/efficiency of educational practice and professional development. The researcher has used the BSC/SFO frameworks (Kaplan & Norton, 1996, 2000) in many technical AR projects (Appendix A.2.1).

Practical AR requires the researcher and practitioner to join together to determine the potential problems, underlying causes, and possible solutions or interventions. The aims of practical AR include not only those for technical AR, but require more understanding and a transformation of consciousness of the practitioner.

Emancipatory AR requires the involvement of all participants equally with no hierarchy existing between the researcher and the practitioners. The researcher tries to reduce the gap between the actual problems identified by the practitioner and the theory used to explain and resolve the problems. The researcher facilitates the

discussion with the practitioners, so as to identify potential underlying problems and assumptions and thus making the researcher a collaborative member of the group. In addition to the requirements for technical and practical AR, emancipatory AR requires that the aims must include the participant's emancipation from the dictates of tradition and self-deception. Within the context of emancipatory AR, there is still a consideration of how much participation is appropriate for the process to be truly emancipatory.

Other Characteristics of AR

There is much debate in the literature as to what distinguishes AR from other research methods (Dick, 2000; Kemmis & McTaggart, 1988). Most definitions of AR focus upon the themes of empowerment of participants, i.e. collaboration through participation, acquisition of knowledge, and social change. These are important values underlying AR that are also frequently observed in business practice. The equally common phrases of systematic inquiry, critical reflection, and strategic action are more appropriately specific to AR. AR differs from everyday practice in that it is a systematic and deliberate process where it is vitally important to plan, act, observe, and reflect with more care, with a more systematic approach, and with more rigor than would be evident in a normal day-to-day business practice environment:

AR fundamentally rejects the concept of a two-stage process in which research is carried out first by researchers and then in a separate second stage practitioners apply the knowledge generated from the research. Instead, the two processes of research and action are integrated.

In addition to the characteristics of AR that have already been described, French (2009a) mentioned six further attributes that distinguish AR from other more traditional forms of research.

- **Collaboration** is the interaction between the researcher or research team and the practitioner or group of practitioners. The practitioners have knowledge of the field or workplace from an internal perspective, especially with regard to the history and culture of the workplace. The researcher is an outsider who has expertise in theory, consulting, and research. The collaboration between the two parties can vary from periodic to continuous collaboration throughout the study, and the nature

of the collaboration is a determinant of whether the research process is technical, practical or emancipatory. However, other writers suggest that the researcher may not be an outside expert and should be considered as part of the team, working from within to formalize the research with and for the practitioners. In order for the collaboration to be emancipatory, the researcher must become part of the team. Collaboration has also been discussed by other writers with the use of alternative terms like 'participation' (Dick, 2002) and 'process management' (Bawden & Zuber-Skerritt, 2002).

- **Problem-solving.** The problem is determined as one of the early tasks of a group assembled by the researcher. A variety of data collection methods observation, interviews, and questionnaires can be used to identify the problem.
- **Change in practice.** The knowledge and understanding developed from the AR process should not only be of theoretical importance but also lead to practical work improvements directly related to the problem or issues that were identified.
- **Theory development.** A fundamental objective of AR is that the results achieved through the research process are utilized by the researcher to develop new theories or expand existing theories. The learning that is gathered during the AR process and the critical reflection and data analysis, creates a developed, tested, and critically examined idea or theory related to the body of knowledge related to the problem.
- **Publication of results.** The theories and solutions that are produced from the AR process should be made public to the other participants and those in the wider community who may have an interest in that work setting or situation.
- **Power.** In technical AR it is the idea that is the source of power for the action and since the idea often resides with the facilitator, it is the facilitator who controls the power in the project. In emancipatory AR, power is located in the group and not with individuals. It is suggested that the researcher is like a moderator of the process, who collaborates and shares responsibility with the other participants.

Summary on AR

In general AR is a family of methodologies that jointly pursues action (or change) and research (understanding or learning) at the same time. As defined, AR generally seeks to be a virtuous spiral of action and of research. As Figure 3.1 shows, each cycle involves diagnosis, planning, action, evaluation and learning. In the later cycles, AR continuously refines the methods, data and interpretation in the light of the evidence and understanding developed in the earlier cycles (Figure 3.2).

AR generally involves a ‘look, think, act’ process. It is, therefore, intended to foster a deeper understanding of a given situation, starting with conceptualizing and specifying the problem and moving through several actions, reflections, refinements and evaluations. It also makes us think about the contexts we are working in, how they affect our judgments and our interpretations on which those judgments are based. The spiral process repeats itself until the desired improvements to practice are achieved.

In general, action research:

- is an evolving process that takes shape as with increasing understanding of the problems and solutions related to the change agenda;
- is an iterative process that converges towards a better understanding of practice and change, where the body of knowledge is added to and built on in attempts to do better with constraints in resources. As a note, DT is also an iterative process;
- is pragmatic in terms of action and of research, relying on data and information from what actually happens. As a note, DT also promotes learning from what actually happens;
- is participative and collaborative because change is usually easier to achieve when those affected by the change are involved in the doing. DT is also collaborative;
- is reflective with careful thought being given to the evidence based from other studies, whatever methodology they used, and to the evidence from what is happening in reality;
- is ‘evidence based’ building on formal research from literature review, other studies and the evidence collated from the real world being faced;

- often blends qualitative and quantitative research and action as neither form of research alone will provide all the answers to the research problem.

AR has the potential to generate genuine and sustained improvements in practice because it can offer:

- better ownership of action and of analysis;
- pragmatic insight into real life issues, constraints and solutions; new opportunities to reflect on and assess work;
- scope and structure to explore and test new ideas, methods, and materials;
- positive and constructive opportunities to share feedback with peers and colleagues;
- a basis for formulating and acting on the evidence and analysis;
- a potential to contribute to new knowledge when the practical learning is cross-referenced with academic literature.

A.3.2 Kurt Lewin on Action Research

This appendix summarizes in point form some key features of Kurt Lewin's work on action research.

- i. Lewin's concept of AR
 - Conceptually crucial are the ideas of group decision and commitment to improvement.
 - Those affected by planned changes have the primary responsibility for deciding on courses of critically informed action that seem most likely to maximize improvement of practice and evaluate the results of strategies tried out in practice.
- ii. Thematic Concern
 - Action research is participatory, collaborative research that typically arises from the clarification of some concerns generally shared by a group.
 - Participants describe their concerns, explore what others think, and probe to find what it might be possible to do.
 - In discussion they decide what is feasible to work on, i.e. a group project.
 - The group identifies the project's thematic concern.

- iii. AR steps
 - Reconnaissance – initial reflection on your situation in light of thematic concern.
 - Planning for improvement.
 - Enacting the plan and observing how it works.
 - Reflection – analyse, synthesize, interpret, explain, draw conclusions.
- iv. The Four Moments of AR
 - Planning critically informed action to improve what is already happening;
 - Acting to implement the plan;
 - Observing the effects of critically informed action in the context in which it occurs;
 - Reflecting on these effects as a basis for further planning, critically informed action and so on, through a succession of cycles.
- v. Types of outcomes from AR. In AR one looks for changes in three different aspects of individual work and the culture of groups:
 - Changes in the use of language and discourses – how people actually identify and describe their world and work;
 - Changes in activities and practices – what people are actually doing in their work and learning; and
 - Changes in social relationships and organization – how people interrelate and how their relationships are structured and organized within the organization.

The AR study conducted in this thesis has three objectives, corresponding to the three characteristics of AR studies originally formulated by Lewin (1946) of action, knowledge production and training:

- i. to help The Firm to implement a strategic change agenda to improve their innovation capability by implementing DT practices;
- ii. to do so via a method which could be generalized to other SMEs, and to synthesize the participants' relevant experience of how to use the method successfully; and
- iii. to share this knowledge with, and between, the participants, as well as documenting it for other organizations in the form of a thesis.

A.3.3 Seven Part Structure for AR Analysis

Parts for AR analysis	Comments
1. Diagram. Diagrammatic representation of the action research cycles	See Figure 3.2.
2. The notion. An AR process begins with a notion in the practitioner's mind that a change in work practice is desirable. The notion is then articulated and used to develop the 'thematic concern' and 'research question'.	<ul style="list-style-type: none"> - Started with 'Growth through Innovation Capability' based on Figure A.6 - Refined to 'New growth by increasing the innovation capability of The Firm through the use of DT' after Cycle 4 - Research question <ul style="list-style-type: none"> • Simpler and more action-oriented approach for strategy development and implementation for SMEs?
3. The AR cycles. The AR cycles are enumerated and objectives set for each cycle. As planning is the first element of each of the AR cycles, a set of objectives for each cycle is articulated. The first AR cycle will include the development and articulation of the 'thematic concern' (the action element) and the 'research question' (the research element) of the project.	<ul style="list-style-type: none"> • Figure 3.2 • Cycles 1 to 4 in Table 4.1, 4.2, 4.3 and 4.4 • Cycle 5 in Table 4.6 • Cycle 6 in Table 4.7 • Cycle 7 in Table 4.10
4. The AR criteria/methodology checklist. An AR criteria/methodology checklist, utilizing the thinking of (Perry & Zuber-Skerritt, 1991, p. 70), is applied at the start of each analysis chapter to confirm that an AR project is occurring.	- Criteria as per checklist below met.
5. The (Dick, 1999) documentation model.	- Each of the AR cycles is described with the use of the same documentation model and format.
6. Other AR characteristics. Conclude with a discussion of how the project demonstrated the six elements:	- Section 5.5
• collaboration	- Cycles 1 through 4
• problem-solving	- Section 4.1
• change in practice	<ul style="list-style-type: none"> - Newer approach to strategy management in The Firm based on model developed - DT practices prevalent - Visual communication now common - Project canvasses, timelines common as in Appendix A.5.2 - Innovation agenda continues as in Appendix B
• theory development	- Discussed in Section 4.3 and Section 5.7
• publication of results	- This thesis
• power	- Section 5.5
7. Conclusion. A conclusion is provided in response to the 'action' outcomes and to provide an answer to the 'research' question.	- Chapter Five

Perry & Zuber-Skerritt Checklist

If yours is a situation in which people reflect and improve (or develop) their own work and their own situations by tightly interlinking their reflection and action and also making their experience public not only to other participants but also to other persons interested in and concerned about the work and the situation, i.e. their (public) theories and practices of the work and the situation;

and, if yours is a situation in which there is increasingly

- i. data gathering by participants themselves (or with the help of others) in relation to their own questions;
- ii. participation (in problem posing and in answering questions) in decision making;
- iii. power-sharing and the relative suspension of hierarchical ways of working towards industrial democracy;
- iv. collaboration among members of the group as a 'critical community': self-reflection, self-evaluation, and self-management by autonomous and responsible persons and groups learning progressively (and publicly) by doing and making mistakes in a 'self-reflective spiral' of planning, acting, observing, reflecting, re-planning, etc.
- v. reflection, which supports the idea of the '(self-)reflective practitioner';

then yours is a situation in which action research is occurring (Perry & Zuber-Skerritt, 1991, p. 70).

A.3.4 OSM Certificate



A.3.5 Selected Pictures from Cycle 1



Figure A.1
Collaborative History Notes Using the Timeline Technique

(Green, yellow and red stickers indicate positive, neutral and negative events respectively.)

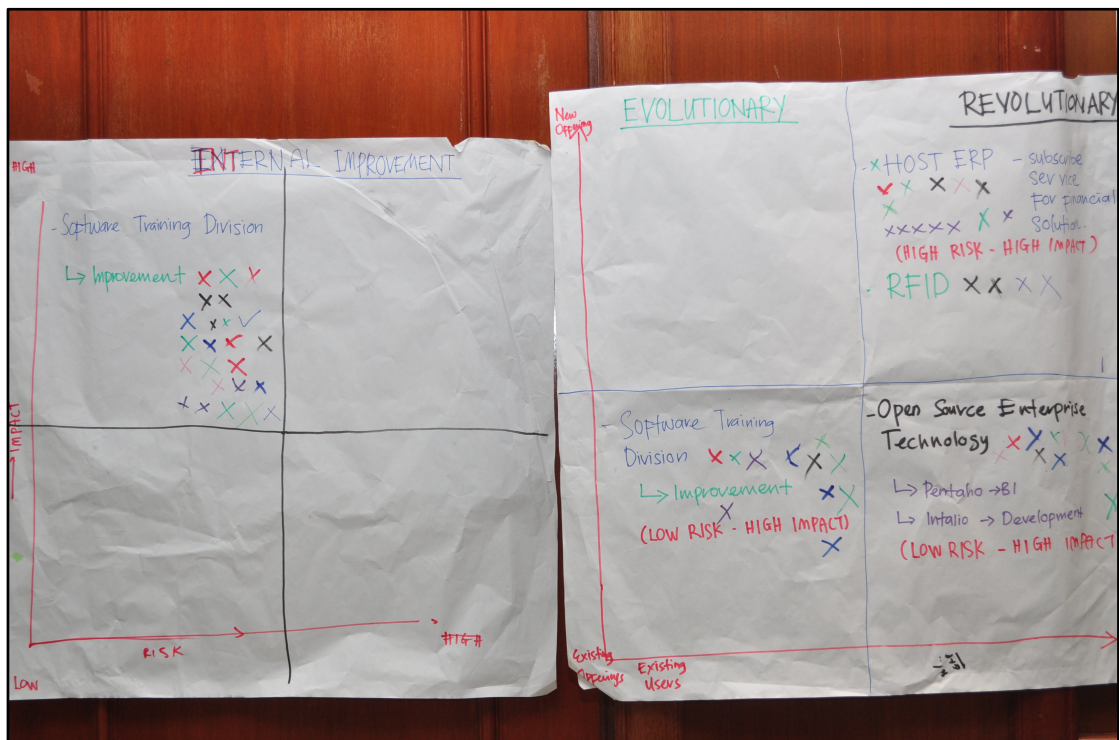


Figure A.2
Sample 2x2 Matrices Used in Cycle 1

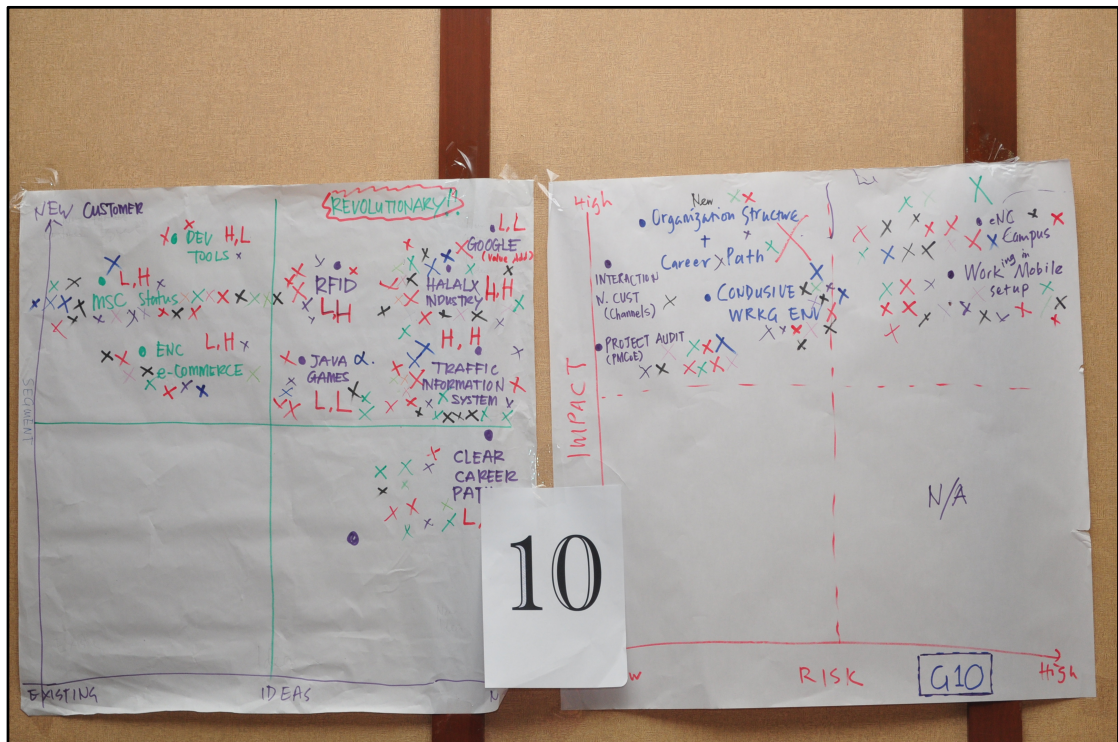


Figure A.3
Voting Done by Other Participants on the Outcome

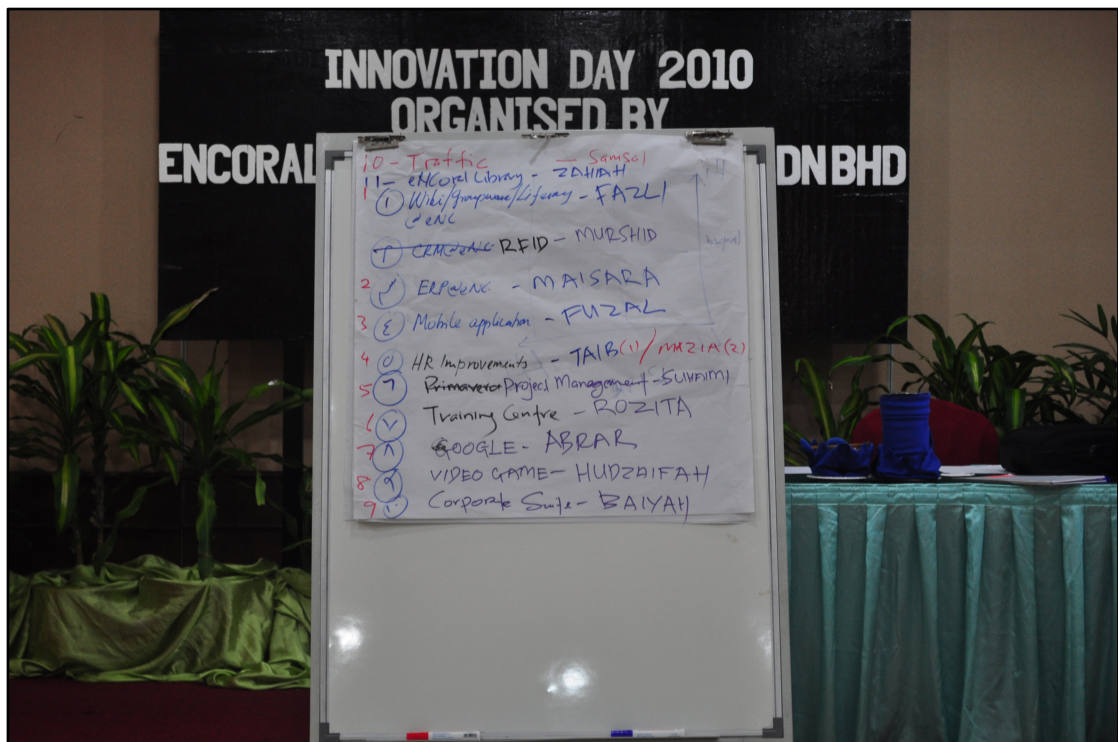


Figure A.4
Initial List of Projects From Innovation Day 2010



Figure A.5
Simple Project Plan for One of the Selected Projects

A.3.6 Selected Pictures from Cycle 2



Figure A.6
Highlighting the Major Strategic Themes

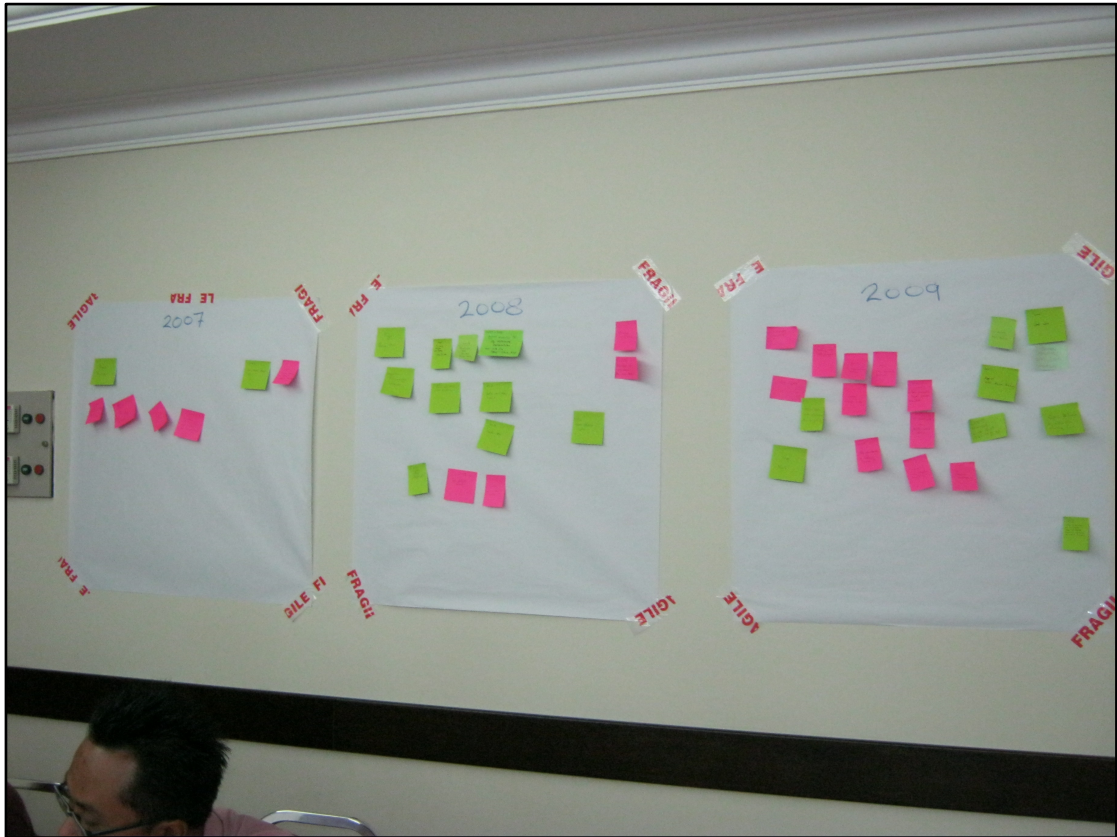


Figure A.7
Timeline Output from Cycle 2

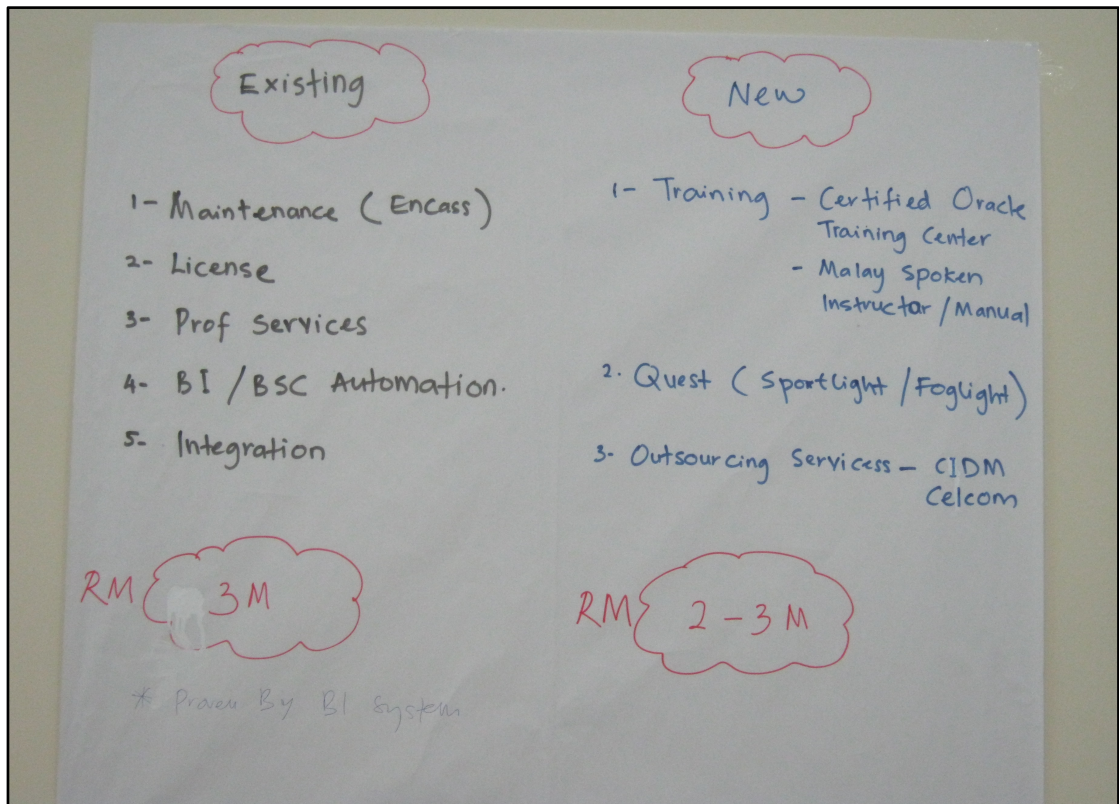


Figure A.8
Cascading Overall Revenue Target by Department



Figure A.9
Project Plan for a New Product

A.3.7 Selected Pictures from Follow-up to Cycle 3

Another customer showcase event was done after Cycle 3.



Figure A.10
E-book Portal and Printed Versions of Selected E-book Titles



Figure A.11
Showing One of the Mobile Applications

A.3.8 Selected Pictures from Cycle 4



Figure A.12
Teams Collaborate to Prototype Ideas Into Simple Models



Figure A.13
Converting Ideas From Oracle Related Business Into Prototypes



Figure A.14
Prototyping Using Lego Serious Play Tools



Figure A.15
Documenting the Lego Prototypes With Pictures

Background shows one of the many project panels in The Firm.

A.4.1 Strategic Outcomes Annual Results

Although the research problem is not about the overall performance of The Firm it is interesting to look at the results of its performance over the planning period from 2010 to 2013. Financial outcome numbers are easily obtainable from The Firm's accounting system and audited reports. Table A.2 looks at four important measures and presents the results relative to the numbers for the financial year ending March 2010. The numbers for 2013 are unaudited. The numbers also relate to the strategic outcomes shown in Figure 4.18. The detailed results for the portion on B2C are discussed in Section 4.2.1.

Table A.2
Selected Financial Data From The Firm

	2010	2011	2012	2013 (Draft)
Revenue	1.00	1.30	1.48	1.79
Revenue Per Employee Cost	1.00	1.46	1.79	1.89
% New revenue	1.00	2.82	4.81	4.28
Investments	1.00	2.91	3.20	4.29

The revenue for 2013 exceeded the 50M target set in Figure 4.18. The new products, services and solutions that came from the ideas and prototypes mentioned in Figures 4.23, 4.26 and 4.27, contributed to the 'new revenue'. Section 2.3 mentions 'percentage of new revenue' as one of the output measures for innovation. The growth in 'new revenue' confirms the success of the innovation element of strategic change agenda. 'Revenue per employee cost' is a simple measure of productivity and also shows an improving trend. As shown in Figure 4.23, one of the new areas of business The Firm planned to venture into was portfolio investment in property, quoted stocks, fixed deposits and private equity. The numbers in Table A.2 show the growth in the asset size of the investments. This indicates success in that portion of the strategic change agenda. It is presented here to complete the discussion on results related to the strategic outcomes shown in Figure 4.23.

A.4.2 e-Book Roadmap

Table A.3 summarizes the product roadmap until 2013 for the book titles. The first version is always the PDF version since it is the easiest to produce. The same content is then used to develop an iOS app and sold through the Apple iTunes App Store. Then The Firm negotiates with a book publisher to do a normal printed version of the book.

The Firm has also developed the technical capability to produce an ePub format of the e-books. It allows the incorporation of richer multimedia features compared to the PDF version. The sales of the ePub version of SOP were slow and the effort to extend it to the other titles was put on hold.

In Jun 2013 The Firm started to explore the Amazon Kindle and Apple iBook platforms and plans to sell versions of the e-book titles in these market places.

The e-book market experienced double growth in 2011 and is expected to grow as e-book readers and tablets become more widespread in use (Greenfield, 2012). This is an exciting new business for which the tools to produce the e-books are getting much easier. As such, success factors like the value of the content, author branding and marketing are more important than technical capabilities.

The e-Book business started as an idea generated in Cycle 1 and went through many cycles of prototyping, product launches and updates. The Firm continues to learn and adapt different product development and marketing tactics to build upon the initial idea.

Table A.3
Product Roadmap

Title Code	PDF	iOS App	Printed	ePub	Amazon Print	Apple iBook
M&WE		Mar 2012	Jan 2012			Jul 2014
SOP	Aug 2011	Sep 2011	Jun 2012	Nov 2012	Jun 2013	Jul 2014
GW1	Sep 2012	Oct 2013			Jun 2013	Jul 2014
HKA1	Jan 2013		Sep 2013			
HKA2	Jul 2013		Sep 2013			
TA	Aug 2013		Aug 2013			
BHMC		Apr 2013			Aug 2013	Apr 2014

A.4.3 Sample Customer Co-Creation Activity

The Firm learned and benefited greatly during the half-day event engaging with the customer as reported in AR Cycle 3. Customer co-creation is an important tool of the designers (Liedtka & Ogilvie, 2011). The Firm made a conscious effort to engage the customer in producing the e-books. One approach was to encourage the customers to vote on the design covers for the e-books. This is easily done using the portal development tools and then promoted to the ‘fans’ via Facebook.

Figure A.16 shows an example of voting for the book cover for the title code GWI. The last design was chosen.

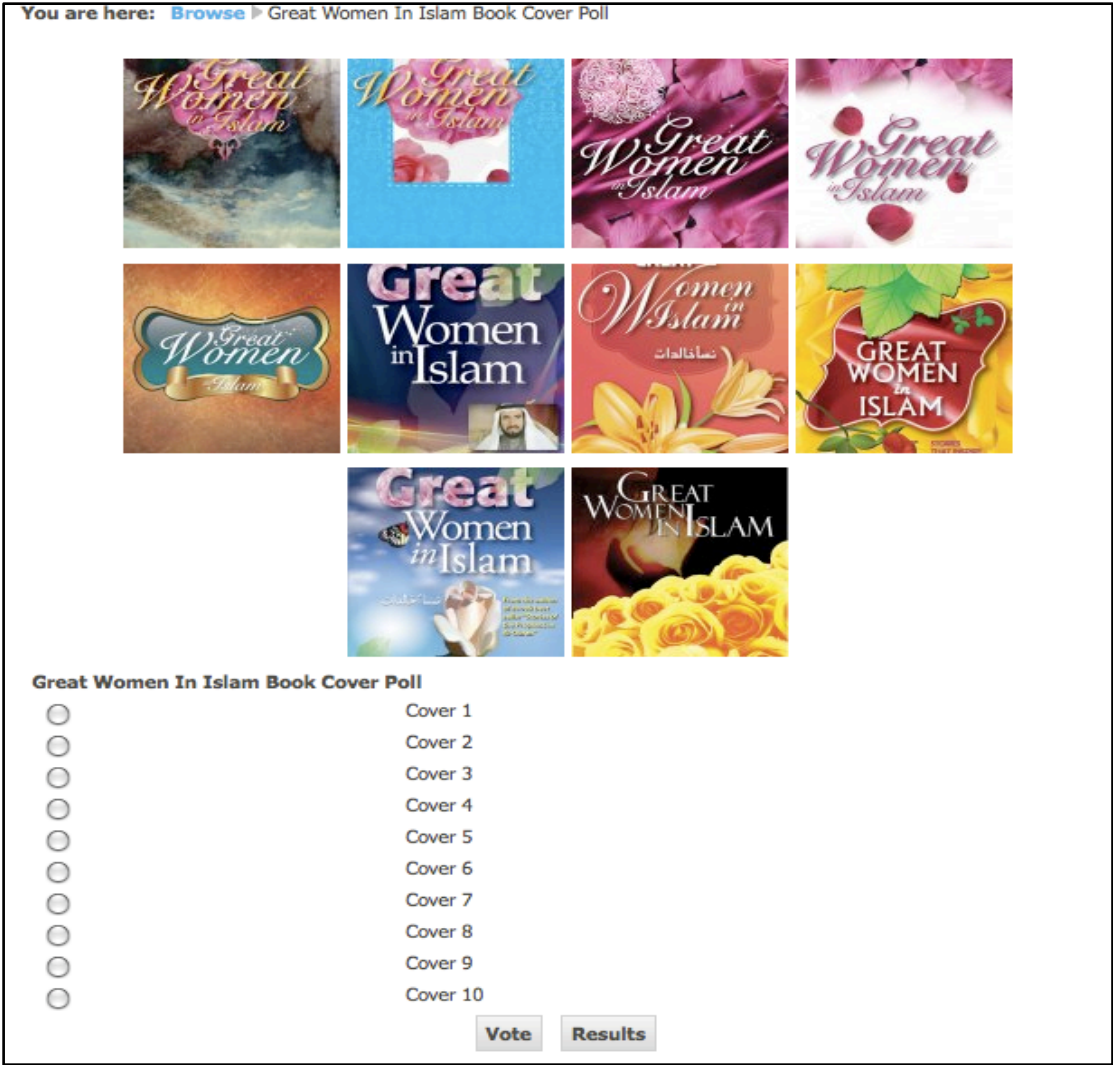


Figure A.16
Voting Activity for Customer Co-creation

A.5.1 Organizational Chart

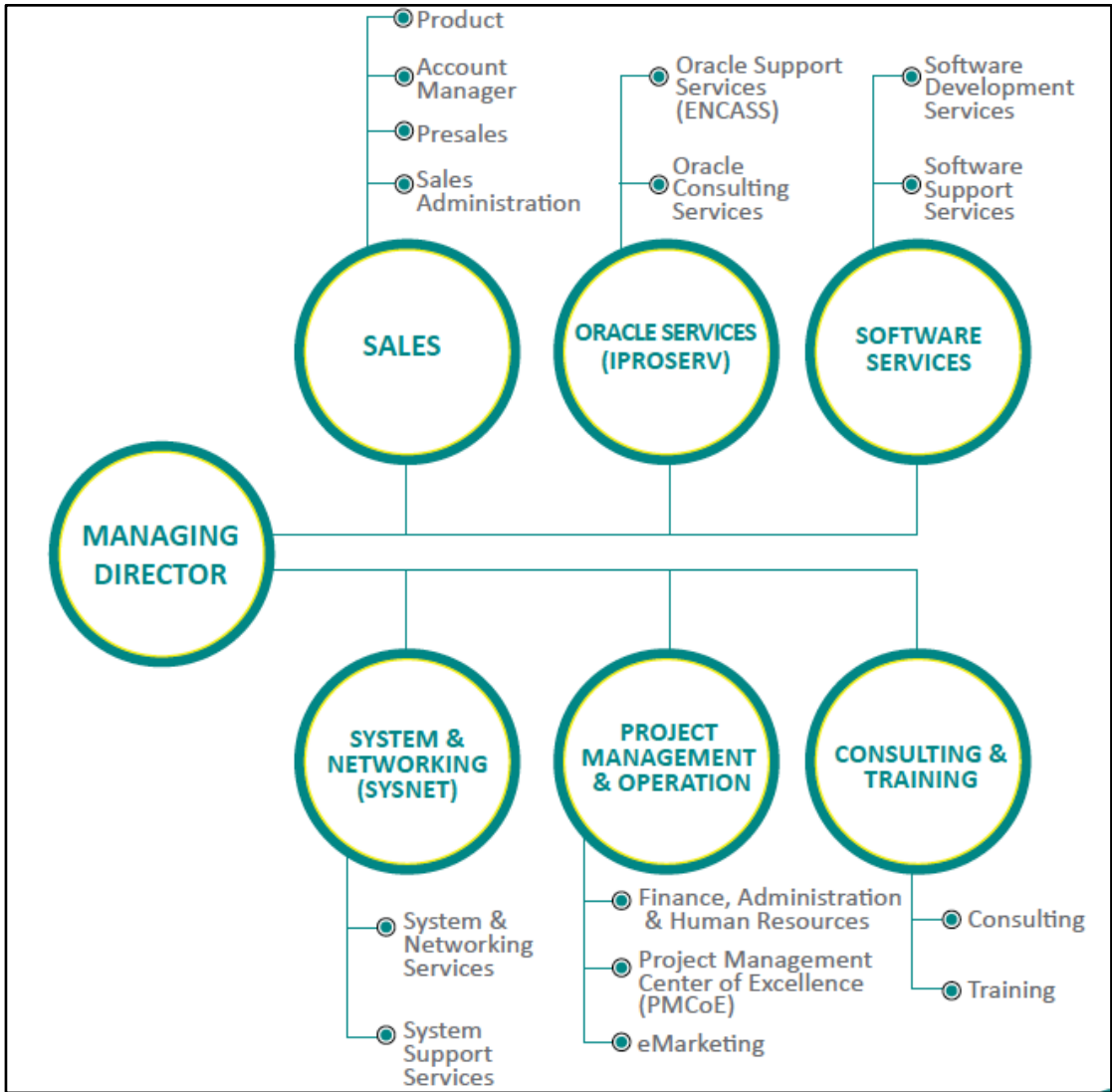
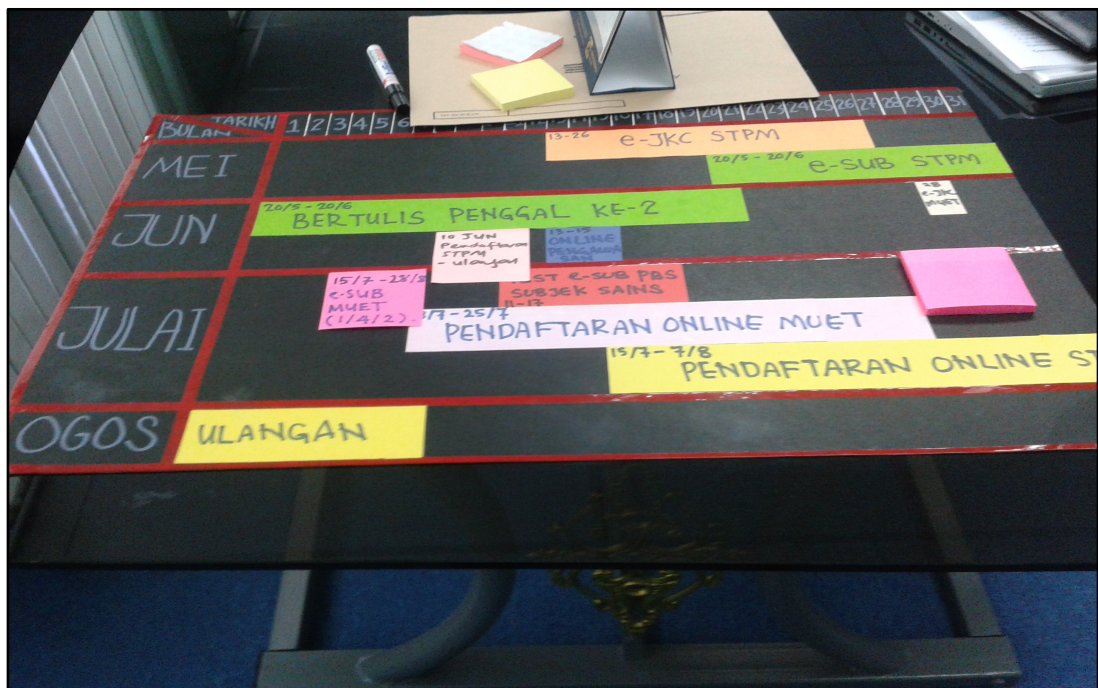
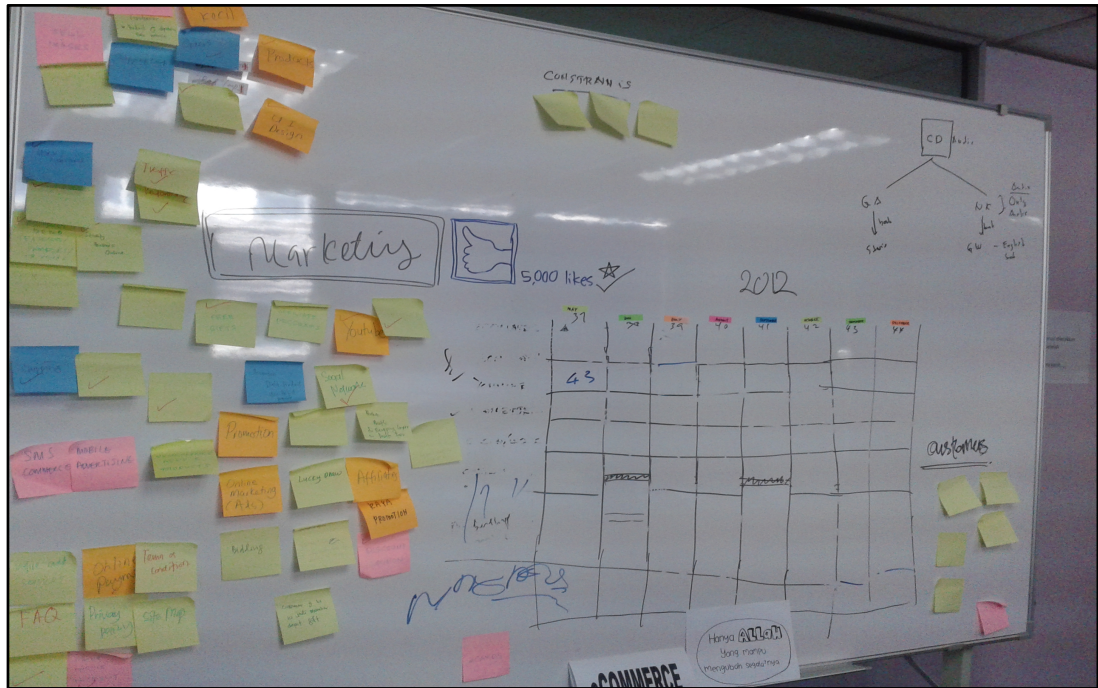


Figure A.17
Organizational Chart

The Firm has a flat structure with only one layer of management. There are no appointed heads for the various functions shown. The practice is to appoint leaders on a project basis.

A.5.2 Project Panels

The pictures below are taken from the various functions and departments in The Firm. It shows the widespread use of project panels and visual timelines. These allow everyone to know the progress of prototypes and projects in the different departments of The Firm. Simple tools like Post-It notes allow people to input comments and suggestions.



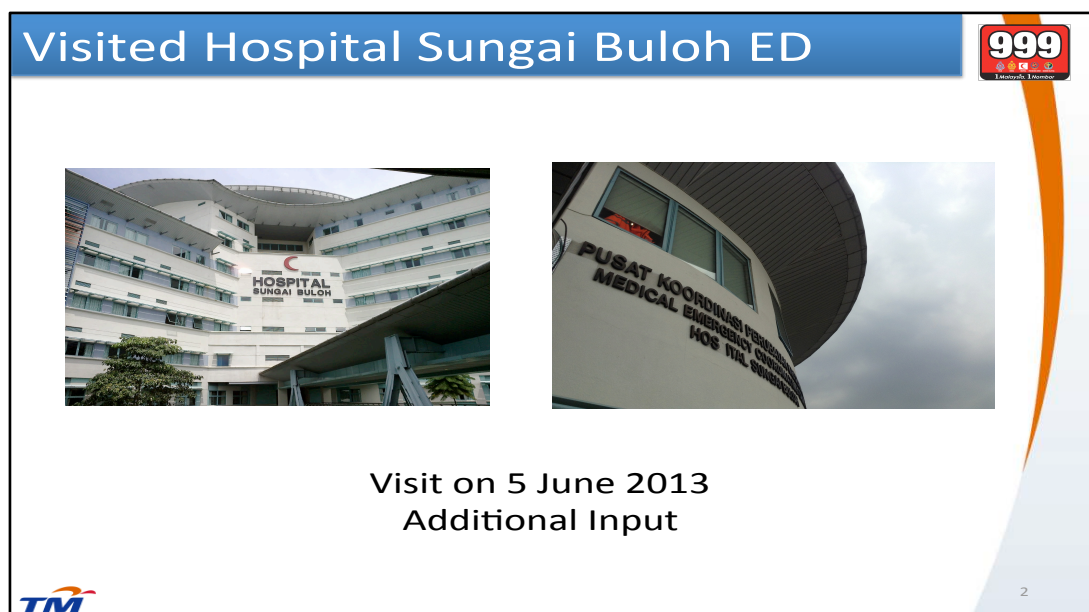
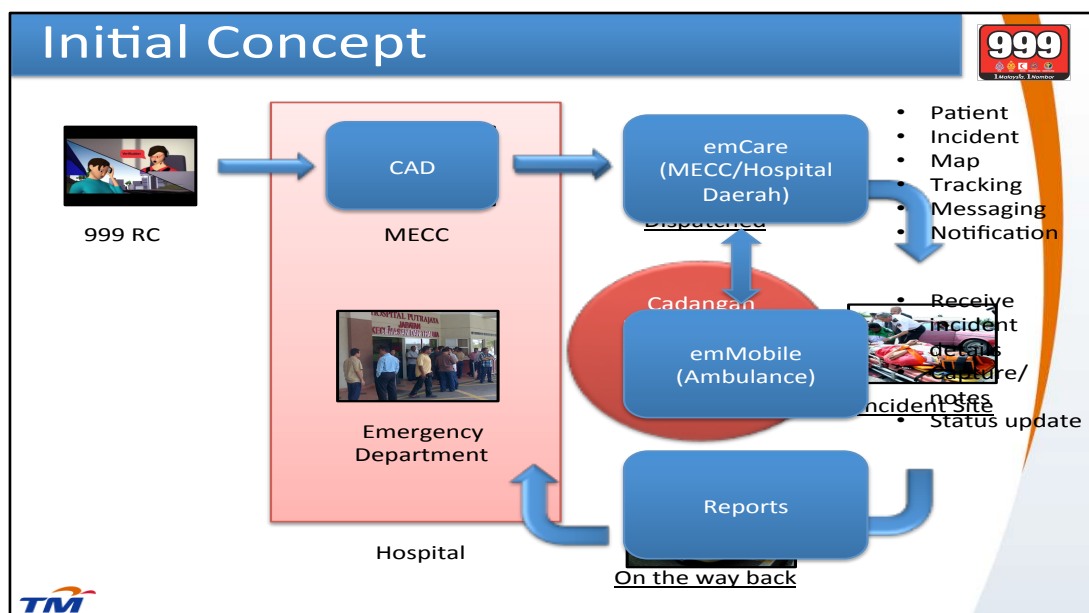


APPENDIX B

B.1.1 Visuals of Latest Prototypes for 2014

The Firm continues with its prototyping approach in developing new products and solutions beyond the strategic planning period from 2010 to 2013. This proves that the DT practices and innovation capability of The Firm are now part of its working style and culture.

The 'Pre-Hospital Care System' is a co-creation effort involving The Firm, TM as the telecommunications provider and a major government hospital. The pictures below briefly describe the features and functions of the system.



emMobile Features



1. Integrates data from CAD system eg: CallCardID, lokasi (lat,long), maklumat Caller, comments (of ProQA) etc via webservice
2. Captures all basic and necessary information that takes place in any incidents, eg: photo of sites, patient situation (ecg, pulse), glasgow coma scale etc
3. Communicates with MECC (at hospital) by sending critical information captured at sites
4. Alerts MECC about location of ambulance & status
5. Allows paramedic to chat with doctor(s) if required
6. Able to view past records of patient or incidents based on location



emCARE Features




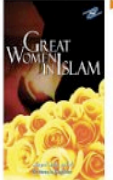


1. Helps doctor(s) to receive early information about incoming patient's condition via images/photos
2. Able to trace ambulance of their whereabouts. This allows, early necessary preparation could be done since ambulance arrival time can be estimated via Google maps
3. Able to communicate with paramedic via chat (if required)
4. Integrates with MyHIX data
5. Produces incidents reporting (subject to discussion of what MOH would require)



B.1.2 Visuals of Book Titles in Amazon.com

Appendix A.4.2 shows the roadmap of the e-book project. The following picture is a snapshot from two titles in amazon.com. The current version uses Amazon's on demand print technology. This is further proof that the initial e-book idea is leading The Firm to newer opportunities and markets.

1.		Stories of the Prophets in Al-Quran (Book 1) (Volume 1) by Dr Tareq Al-Suwaïdan (May 27, 2013) Formats Paperback Order in the next 15 hours to get it by Wednesday, Jul 10. Eligible for FREE Super Saver Shipping.	<table border="1"> <thead> <tr> <th>Price</th> <th>New</th> <th>Used</th> </tr> </thead> <tbody> <tr> <td>\$6.00 \$5.77 ✓Prime</td> <td>\$5.67</td> <td></td> </tr> </tbody> </table>	Price	New	Used	\$6.00 \$5.77 ✓Prime	\$5.67	
Price	New	Used							
\$6.00 \$5.77 ✓Prime	\$5.67								
2.		Stories of the Prophets in Al-Quran (Book 2) (Volume 2) by Dr Tareq Al-Suwaïdan (May 29, 2013) Formats Paperback Order in the next 15 hours to get it by Wednesday, Jul 10. Eligible for FREE Super Saver Shipping.	<table border="1"> <thead> <tr> <th>Price</th> <th>New</th> <th>Used</th> </tr> </thead> <tbody> <tr> <td>\$6.00 \$5.40 ✓Prime</td> <td>\$5.30</td> <td></td> </tr> </tbody> </table>	Price	New	Used	\$6.00 \$5.40 ✓Prime	\$5.30	
Price	New	Used							
\$6.00 \$5.40 ✓Prime	\$5.30								
3.		Stories of the Prophets in Al-Quran (Book 3) (Volume 3) by Dr Tareq Al-Suwaïdan (Jun 26, 2013) Formats Paperback Order in the next 15 hours to get it by Wednesday, Jul 10. Eligible for FREE Super Saver Shipping.	<table border="1"> <thead> <tr> <th>Price</th> <th>New</th> <th>Used</th> </tr> </thead> <tbody> <tr> <td>\$6.50 \$5.85 ✓Prime</td> <td></td> <td></td> </tr> </tbody> </table>	Price	New	Used	\$6.50 \$5.85 ✓Prime		
Price	New	Used							
\$6.50 \$5.85 ✓Prime									
4.		Great Women in Islam by Dr Tareq Al-Suwaïdan (Jun 25, 2013) Formats Paperback Order in the next 15 hours to get it by Wednesday, Jul 10. Eligible for FREE Super Saver Shipping.	<table border="1"> <thead> <tr> <th>Price</th> <th>New</th> <th>Used</th> </tr> </thead> <tbody> <tr> <td>\$15.00 \$14.25 ✓Prime</td> <td></td> <td></td> </tr> </tbody> </table>	Price	New	Used	\$15.00 \$14.25 ✓Prime		
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