

FOSTERING SUSTAINABLE COMPETITIVE ADVANTAGE
THROUGH BUSINESS PROCESS MANAGEMENT

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FACULTY OF BUSINESS AND ACCOUNTANCY
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ORIGINAL LITERARY WORK DECLARATION

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ABSTRAK

Organisasi kian berdepan dengan pelbagai cabaran dalam menangani operasi harian dan berjuang untuk mendahului pesaing-pesaing yang lain. Pengurusan proses perniagaan atau *BPM* boleh membantu dalam membina dan menggalakkan ketahanan daya saing atau *SCA*. Kajian ini menyelidik *BPM* dengan menggunakan *dynamic capability theory*, *contingency theory* dan *task-technology fit theory* sambil menggunakan kaedah penyelidikan *qualitative* dan *quantitative*. Tesis ini menyelidik hubungan antara *BPM* dan *SCA*. Tesis ini juga mengkaji penentu-penentu *BPM* ke atas *SCA*. Antara penentu yang dimaksudkan adalah *structural alignment*, *strategic alignment*, *IT capability* dan *process flexibility*. Kaedah *focus group discussion* digunakan untuk membina instrument kajian untuk *process flexibility* manakala kaedah soal selidik digunakan untuk mengumpul data daripada organisasi-organisasi di Malaysia. Analisis data dilakukan dengan menggunakan kaedah *Structural Equation Modelling (SEM)*. Keputusan daripada kajian ini mendedahkan bahawa *BPM* berhubungkait dengan *SCA* dan *structural alignment*, *strategic alignment* dan *process flexibility* adalah penentu-penentu *BPM* untuk *SCA*. *IT investment* pula berfungsi sebagai *moderator* dalam hubungan *BPM* dan *SCA*. Akhir kata, tesis ini memberi sumbangan dari segi teori, penkaedahan dan praktik.

ABSTRACT

Organisations are faced with high levels of complexity in running their day-to-day operations while striving to stay ahead of competition. Business Process Management (BPM) is regarded as the key in building and maintaining Sustainable Competitive Advantage (SCA). This study explores BPM based on dynamic capabilities theory, contingency theory and task-technology fit theory while employing both qualitative and quantitative research methods. This thesis investigates the relationship between BPM and SCA. In addition, the determinants of BPM on SCA are also explored. The determinants are structural alignment, strategic alignment, IT capability and process flexibility. Focus group discussion was used to develop the measurement instrument for process flexibility and survey research method was used to collect data from organisations in Malaysia. Data analysis was carried out using Structural Equation Modelling (SEM). The findings from this thesis reveal that BPM influences SCA and mediates the relationships between structural alignment, strategic alignment and process flexibility with SCA. Lastly this study also reveals that IT investment moderates the relationship between BPM and SCA. This thesis provides theoretical, methodological and practical contributions for BPM.

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LIST OF SYMBOLS AND ABBREVIATIONS

AMOS	Analysis of Moment Structure
BPM	Business Process Management
BPO	Business Process Orientation
BPR	Business Process Re-engineering
CEO	Chief Executive Officer
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CFO	Chief Financial Officer
cmin/df	Normed Chi-Square
df	Degree of Freedom
EFA	Exploratory Factor Analysis
FGD	Focus Group Discussion
GM	General Manager
IS	Information Services
IT	Information Technology
KMO	Kaiser-Meyer-Olkin
NFI	Normed Fit Index
PII	Process Improvement Initiative
PNFI	Parsimony Normed Fit Index
RMR	Root Mean Square Residual
RMSEA	Root Mean Square of Approximation

SCA	Sustainable Competitive Advantage
s.e.	Standard Error
SEM	Structural Equation Modelling
SM	Senior Manager
SPSS	Statistical Package for Social Science
STD DEV	Standard Deviation
TQM	Total Quality Management
VIF	Variance Inflating Factor
VP	Vice President

CHAPTER 1 INTRODUCTION

1.1. Overview

More than a decade has passed since the entry of the 21st century. The digital revolution since the 1980s and globalisation have brought about immense changes in the way businesses operate. The rate of change and level of complexity has brought about a general realisation that just maintaining current strategy or improving from last year's performance is no longer the remedy for excellence (Jeston, 2008). In addition, threats from internal factors equally affect organisational performance as external environmental factors. Organisations intending to enhance their competitive position need to transform to become more process-centric as it is through operational excellence that strategic outcomes can be realised (Jeston, 2008; Richardson, 2007).

A process-centric organisation takes concerted efforts to document, manage and monitor performance of process outcomes. Total Quality Management (TQM) philosophy and Business Process Reengineering (BPR) principles allowed organisations to put in place what was necessary to create operational excellence with business processes playing the central theme. Although TQM and BPR are perceived as two very different philosophies by academicians; practitioners however did not observe any difference and often referred their initiatives as BPR or TQM interchangeably (Burdett, 1994).

When researchers delved deep into the implementation of BPR and TQM, they concluded that both complement one and another (Burdett, 1994; Choi & Chan, 1997; Paim, Caulliraux, & Cardoso, 2008). BPR involved radical change while TQM was focused on continuous incremental improvement. Researchers suggest implementing BPR followed by TQM to ensure that the radical change can be sustained over a longer period of time (Altinkemer, Chaturvedi, & Kondareddy, 1998; Choi & Chan, 1997; Paim et al., 2008). As such, the elements of TQM and BPR were integrated together and renamed as Business Process Management (BPM).

This study primarily focuses on BPM and its relationship with Sustainable Competitive Advantage (SCA). SCA is the modern extension of organisational performance and competitive advantage. SCA is about the ability of organisations to build their resources and capabilities to create competencies such that competitors are unable to replicate (J. Barney, 1991; Chaharbaghi & Lynch, 1999; Rijamampianina, Abratt, & February, 2003). Other key organisational factors are also included in the study to investigate the inter relationships among the variables. Overall this study is unique not only in its blend of variables under study, but on the context in which the study is carried out. This study focuses on organisations in Malaysia, including both manufacturing and services industry since BPM is equally important to both industries and the behaviour of BPM should be independent of the nature of the industry.

The subsequent sections within this chapter are aimed at providing some background information, introducing the main concepts and the theory of interest, defining the problem statement, identifying the research questions, outlining the research objectives and presenting the significance of this study. Finally the outline of this thesis is presented.

1.2. Background of the Study

TQM and BPR were extensively researched against organisational performance based on various theories. The sub-sections below explain how TQM and BPR eventually evolved into BPM. Similarly the perspective of SCA is introduced and its extension from organisational performance is explained.

1.2.1. Evolution of Business Process Management (BPM) from Total Quality Management (TQM) and Business Process Reengineering (BPR)

The scientific management theory gave birth to the Total Quality Management (TQM) movement in the 1970s. TQM advocates meeting or exceeding customer needs through continuous improvements until ultimately achieving customer satisfaction (Ghobadian & Gallear, 2001; Joiner, 2007). Numerous researches over the years were conducted to determine the implications of TQM on organisational performance (Sousa & Voss, 2002) spanning across a number of theories including market-based theory of competitive advantage, resource-based theory of the firm and systems theory (Reed, Lemak, & Mero, 2000).

TQM was also studied within the context of management theory (Jr. & Bowen, 1994) as an attempt to understand the mechanisms of how organisations operate. In the study, the context of management theory was compared in terms of leadership, human resource activities, strategic quality planning, information and analysis, management of process quality, customer focus and customer satisfaction. The study concluded that

TQM is consistent with management theory and can potentially set new directions for management theory.

In addition to that, Anderson, Rungtusanatham & Schroeder (1994) proposed the theory of quality management, developed from Deming's management method as a potential new theory. Despite the theoretical developments, in terms of practice, TQM was measured based on its impact on organisational performance. The nature of TQM principle which is based on incremental continuous improvement results in slow recognition of its effects within the organisation. The slow or inconclusive results from TQM movement contributed towards the emergence of Business Process Reengineering (BPR) that raised hopes of radical improvements with quick realisation of results.

BPR gained momentum in the 1990s to drive home the concept of process focused organisations (Kambil, 2008). It produced mixed results on organisation performance due to poor understanding of how best to approach its implementation. Many researches were conducted to gain better understanding of the critical success factors of BPR implementation and the importance of change management in steering the outcome of BPR in a positive direction (Grover, Jeong, Kettinger, & Teng, 1995).

An important realisation is that although the outcome of BPR is reengineered business processes; however, the end result is process management (Lok, Hung, Walsh, Wang, & Crawford, 2005; Perrin, 1995). It is about implementing cross-functional processes with appropriate tracking mechanisms for establishing process performance, improving process for greater efficiency and auditing for process compliance (Fisher, 1996). However, the concept of BPR was frequently misunderstood to be related to downsizing or automation but in reality IT was applied as a "breakthrough" for

increasing efficiency (Burdett, 1994; Choi & Chan, 1997; Teng, Grover, & Fiedler, 1996).

Burdett (1994) believed that organisations should adopt BPR and TQM together, first to implement BPR for achieving fast results followed by TQM to sustain the performance over a long period of time. This suggestion proved very logical especially when the study by Altinkemer et al. (1998) revealed that BPR had a positive impact on organisational performance in the first year of implementation, however, it was difficult to sustain the performance in the long run. Besides, the distinction between BPR and TQM in practise was also reported as blurred. There was no conflict in this unison as both TQM and BPR focuses on process improvements and organisational performance (Doss & Kamery, 2006). Thus, the evolution of BPM in the new millennia (Paim et al., 2008). BPM brings together the winning attributes of both TQM and BPR. BPM consist of radical improvements using scientific methods and continuous improvements to sustain the performance. The concept of BPM is aptly illustrated by the researchers in Figure 1.1.

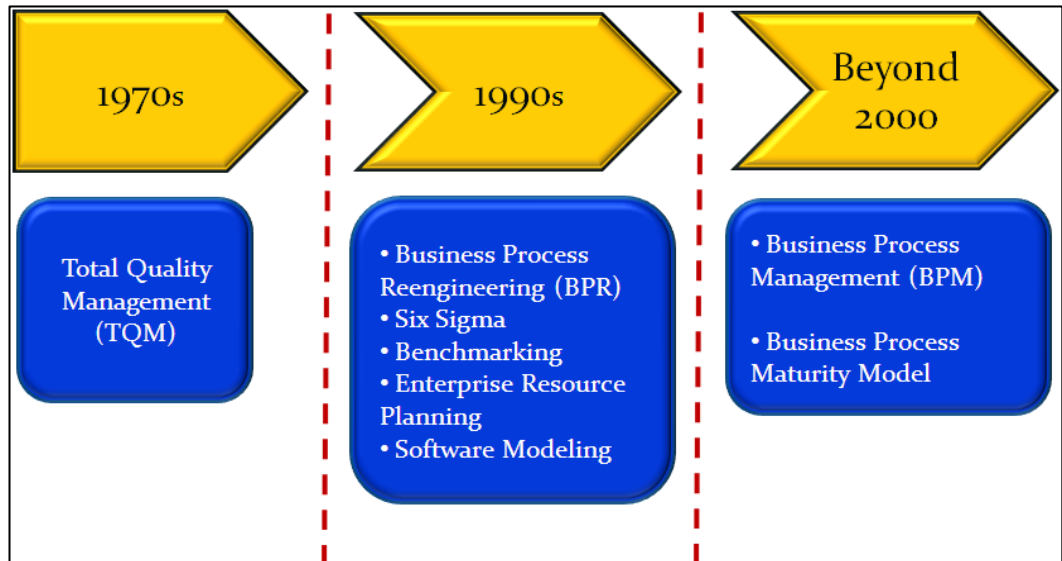


Figure 1.1: Evolution of BPM

Source: (Paim et al., 2008)

Hung (2006) supported Burdett (1994) that in uniting the efficiency aspect of TQM and the effectiveness aspect of BPR, it can be expected that BPM's mission would be to enable critical processes affecting customers to be executed efficiently and effectively. The move to process orientation is important for organisations keen on breaking down barriers within the structure, improving communications for problem solving and increasing customer value (Sever, 2007). The main difference between a process-driven organisation and a functionally-driven organisation is that the process-driven organisation is geared towards meeting and satisfying customer needs while a functionally-driven organisation is one that is geared towards meeting its targets.

The key elements to BPM are as follows (Goldkuhl & Lind, 2008; Lee & Dale, 1998; Zairi, 1997):

- Documented processes.
- Horizontal linkages across organisation structure.
- Availability of systems and procedures to ensure consistency or performance.
- Implementation of tracking and measurement of performance.
- Continuous improvement through problem solving.
- Cultural change geared towards process orientation.

BPM strives to establish, maintain and improve the key drivers for increasing business performance since BPM is the logical platform that links the people and systems in an organisation (Vergidis, Turner, & Tiwari, 2008). In addition to business performance, staying ahead of competition and creating competitive advantage have been the trend observed among practitioners in recent years.

1.2.2. Organisational Performance versus Sustainable Competitive Advantage (SCA)

Organisations in the past have been concerned with short term goals such as increased revenue and profits. However, organisations who spend concerted efforts in strategic planning understand the importance of not only achieving short term objectives but also long term objectives (Porter, 1985). Long term objectives can be observed in objectives which focus on attaining certain market position or market share. It is also related to the ability to out-compete rivals. Sustainable Competitive Advantage (SCA)

provides such a perspective as it is concerned with the unique proposition the organisation delivers to customers while business performance is usually monetary related. The importance of customers are amplified by acknowledging that it is the customer's decision to engage with an organisation as such the value chain of the organisation needs to be able to meet with the demands of their customer.

Extensive studies on the impact of BPR, TQM and BPM on organisational performance have been observed (Lok, et al., 2005; Hung, 2006; Lepmets, et al., 2012). The studies usually examine the context of organisational performance in terms of revenue, sales, profits, return on assets and return on investments or market position. SCA is relatively a new study compared to organisational performance. However, the later provides a different perspective by gauging the ability and capability of organisations to articulate and deliver strategies. The elements of SCA focus on creating differentiation to customers that are unique to the organisation and cannot be easily acquired by competitors. This is an important distinction of SCA.

1.3. Problem Statement

From a theoretical perspective, the purpose of examining BPM and SCA is based on dynamic capabilities theory. This theory is an extension of resource-based theory. Since dynamic capabilities theories looks into the modern concepts of SCA, agility and flexibility, it is gaining momentum in the research areas of business and management. Dynamic capabilities theory advocates that it is through building internal capabilities that organisations can create products or render services that is difficult for their competition to imitate or duplicate (Gowen & Tallon, 2005). One such internal

capability is BPM. Processes are blueprints of how work is carried out in any organisation. When processes and information technology are harnessed well, it can create an internal capability that will position organisations with greater competitiveness (Porter, 1985). This is because SCA can only be achieved when current or future competitors are unable to duplicate the organisations efforts (J. Barney, 1991; Chaharbaghi & Lynch, 1999; Rijamampianina et al., 2003).

When BPM is harnessed into an internal capability that can deliver a unique proposition, then it can be an element that provides competitive advantage. If such a relationship exists and can be demonstrated, then practitioners will be convinced of the value of BPM and this would result in a wider level of acceptance to the field of knowledge of BPM (Vergidis et al., 2008).

Despite its existence for over two decades, most researches on BPM were conceptual using case studies and lacks in empirical validation. Due to this reason, the area of BPM is still very much regarded as atheoretical (Trkman, 2010). Past researches have examined BPM based on case study and conceptual views. Although this was very helpful with the practical aspects of BPM implementation, however, the ontology and epistemology of BPM remained vague. The ontology and epistemology can only be strengthened based on theory and research rigor. Therefore, the purpose of this research is to view BPM using dynamic capabilities theory, contingency theory and task-technology fit theory based on Trkman's (2010) study. Past researches on BPM have been based on systems theory, resource based view theory and contingency theory, among others. However, dynamic capabilities theory places BPM as an internal capability that may have the potential to create competitive advantage. Since dynamic capabilities theory examines SCA, hence the relationship between BPM and SCA is

explored because such a relationship has yet to be discovered. This is an important area to be investigated since BPM can provide practitioners with unique internal capability that cannot be easily duplicated by their competitors.

In addition to exploring the influence of BPM over SCA, this study also attempts to gauge the determinants of BPM on SCA, namely structural alignment, strategic alignment, IT capability and process flexibility. Since this study also examines the interplay between dynamic capabilities theory, contingency theory and task-technology fit theory, thus the antecedents' mentioned earlier were selected. Based on the understanding of BPM, it is believed that BPM may enhance structural alignment towards SCA. A properly aligned organization may be a contributing factor towards building competitive advantage. Likewise, any organization that has strategic alignment towards its operational activities may be able to create competitive advantage. IT capability too if integrated well within the operational activities can deliver superior competitive advantage (Bharadwaj, 2000). Finally, it is believed that when process flexibility exists within an organization that too can enhance SCA through BPM. Structural alignment and strategic alignment are two aspects included in this study to represent the link between contingency theory and dynamic capabilities theory. While IT capability views the relationship between task-technology fit theory and dynamic capabilities theory.

Next, this study also attempts to examine IT investment's moderating effect on the relationship between BPM and SCA. Although numerous studies are available on IT investment, there is a lack of documented evidence on the moderating effects of IT investment between BPM and SCA. IT investment is categorized under task-technology fit theory. Liu, Lu & Hu (2008) study on IT investment looks at the moderating and

mediating relationship between IT capability and IT investment. Bharadwaj (2000) suggests investigating if IT investment on BPM yields greater SCA. BPM is believed to influence SCA and the relationship could be strengthened with appropriate investments in IT to increase the efficiency of BPM either through automation or superior workflow.

Apart from that, the measurement instrument for process flexibility is inadequate as the existing instruments focus on manufacturing industry. This study on the other hand attempts to include both manufacturing and services industries, therefore warrants the need for a common measurement instrument for process flexibility. This is to ensure that respondents from either industry can understand and respond to the instrument in a similar fashion. Hence this study also attempts to develop common instrument to measure process flexibility for both manufacturing and services industries.

1.4. Research Questions

This study aims at investigating the problem as outlined in the previous section. The problem that needs to be investigated revolves around BPM and SCA. This study aims to explore the relationship between BPM and SCA. In addition, there are certain organisational factors that act as enablers of BPM. As such, this study sets out to determine those organisational factors and understand if BPM mediates the relationship between those organisational factors to SCA. Lastly, the study also aims to determine if IT investments on BPM can enhance the influence over SCA. Therefore, this research seeks to answer the following research questions:

1. What are the factors that enable BPM?
2. What is the relationship between BPM and SCA?
3. How does BPM mediate the relationship between the four determinants, namely structural alignment, strategic alignment, IT capability and process flexibility to SCA?
4. What is the level of moderation by IT investment on the relationship between BPM and SCA?

1.5. Research Objectives

BPM is important to organisations. It not only has the potential to increase organisational performance but also enhance its competitive advantage. Moreover, BPM can also influence other organisational factors in creating competitive advantage. These are the compelling statements that motivated this study. Based on that, the problem statement and research questions were defined. In order to address the problem statement and answer the research questions, the objectives of this study can be outlined as follows:

- To determine the enablers of BPM in achieving SCA.
- To determine the impact of BPM on SCA.
- To empirically test a framework with BPM as the mediator and IT investment as the moderator, for the purpose of generalisability.

It is important that the research objectives answer the research questions outlined in Section 1.4. Table 1.1 below links the research objectives to the research questions.

Table 1.1: Research Questions and Research Objectives

Research Questions	Research Objectives
1. What are the factors that enable BPM?	To determine the enablers of BPM in achieving SCA.
2. What is the relationship between BPM and SCA?	To determine the impact of BPM on SCA.
3. How does BPM mediate the relationship between the four determinants, namely structural alignment, strategic alignment, IT capability and process flexibility to SCA?	To empirically test a framework with BPM as the mediator and IT investment as the moderator, for the purpose of generalisability.
4. What is the level of moderation by IT investment on the relationship between BPM and SCA?	

1.6. Significance of the Study

This study aims to provide theoretical and empirical evidence towards theory building for BPM specifically dynamic capabilities theory, contingency theory and task-technology fit theory. This would result in enriching the epistemology of BPM. Key organisational factors are explored to gauge the level of influence in enabling BPM to function effectively in the organisational environment. This study also introduces process flexibility to determine its impact on BPM by developing an appropriate measurement instrument for the use of both manufacturing and services industries.

The significance of this study can be viewed within the perspectives of both academicians and practitioners. From the academicians' perspective, this study would be able to contribute a model with theoretical underpinnings to understand the antecedents of BPM and its impact on SCA. This study would also be able to provide empirical support for the mechanisms through which BPM impacts SCA.

The scope of the study covers both organisations from the manufacturing and services industry. As such, the outcome of the study would benefit both these industries. Every organisation has its own unique BPM. However, the level of practice and the results enjoyed by organisations implementing BPM can be analysed holistically and compared for knowledge building.

From the practitioners' perspective, this study would contribute towards understanding how BPM can impact SCA; thus increase the present level of awareness and importance associated with effectively managing processes. This would enable practitioners to justify the need to allocate resources towards improving their organisational processes and the management of those processes. In the long run, organisations would be in a better position in facing the volatile and dynamic conditions of the market.

Finally, significance of this study would be in the development of an instrument to measure process flexibility. As explained earlier, the available instruments to measure process flexibility was inadequate because it was geared towards the manufacturing industry. This study covers both manufacturing and services industry. As such, with the development of a common measurement instrument for process

flexibility that can be applied to both industries, it is believed that the instrument can be used by future researchers with similar scope of studies.

1.7. Thesis Outline

This thesis contains five chapters. The first chapter introduces the research by providing background information about the study. Chapter 1 also introduces the problem statement while explaining why the problem is a genuine area worthy to be investigated. Subsequently, the corresponding research questions and research objectives are outlined. Last but not least, the significance of this study and the contributions arising from this study is presented. In summary, chapter 1 attempts to provide strong conviction for this research.

Chapter 2 provides existing literature pertaining to the research. The literature review encompasses all the variables involved in the research and the impacted theories. This chapter attempts to provide adequate critique to the existing body of knowledge and ultimately support the problem statement and research questions with existing gaps identified through the literature review.

Chapter 3 covers the research methodology covering both qualitative and quantitative approach. In this chapter, the most suitable methods for empirically investigating the problem statement and research questions are outlined. This chapter also documents the rigour in research that would be applied to the research such as the sampling technique and tools for analysis.

Next, chapter 4 reports the data analysis and findings. In this chapter the outcome of all tests carried out will be reported and mapped against the hypotheses concluding whether the hypothesis was supported or not supported by the findings.

Chapter 5 discusses the findings and attempts to answer the research questions and address the problem statement. This chapter draws on the linkage between theory and practice. It is through this chapter that the behaviour of the data collected against the problem statement will be clearly understood. Finally this chapter brings the thesis to a closure with conclusion, limitations and suggestions for future research.

1.8. Chapter Summary

This introductory chapter sets the tone for the thesis by outlining the background of the study and introducing the main areas of interest which is BPM and SCA. BPM evolved from TQM and BPR while SCA evolved from organisational performance. The aim of this study is to investigate the influence of BPM on SCA. In addition, the study also explores the mediating effects of BPM between identified organisational factors and SCA. This study advocates that BPM is key in delivering unique propositions to organisations, to the extent that it serves as competitive advantage over the organisations rivals. BPM also has the potential to harness other organisational factors to create SCA.

The main purpose of this chapter is to introduce the problem statement, pose the research questions and highlight the research objectives. This chapter also addresses the significance of the study and the potential benefits the outcome of the study would deliver to the academic and practitioner communities. The chapter concludes with an outline of the thesis.

CHAPTER 2 REVIEW OF LITERATURE

2.1 Introduction

In Chapter 1, the problem statement, research questions and research objectives were articulated. The sections within this chapter presents the existing literature on the underpinning theories - dynamic capabilities theory, contingency theory and task-technology fit theory along with the variables involved in the study. Subsequently, relationships among the variables are discussed along with the current gaps in the literature.

2.2 Governing Theories

The concept of quality management and process management initially was examined using systems theory. This view seemed sufficient as the nature of processes, its inputs, activities and outputs were able to be explored with systems theory (Cusins, 1994). Over time, with the accumulation of knowledge and evolution into a full management practise, quality management theories were proposed (Anderson, Rungtusanatham, & Schroeder, 1994; Jr. & Bowen, 1994). However, quality and process management was also studied using other theories such as strategic theory, agency theory, resource-based theory, etc.

This study is based on three fundamental theories; dynamic capabilities theory, contingency theory and task-technology fit theory. The novel idea to combine these three theories under one study as proposed by Trkman (2010) form the basis of this study in determining the influence of BPM on SCA.

2.2.1 Dynamic Capabilities Theory

Dynamic capabilities theory is an expansion of resource-based theory and is gaining significant importance in the study of business and management. Barney (2001) explains that sources of SCA cannot be solely derived from resource-based view. This line of argument is supported by Chaharbaghi & Lynch (1999) who believe that the concept of SCA through resource-based view creates the following limitations:

- Element of dynamism is not present. Since it is accepted that SCA is a journey and not destination, then the element of dynamism needs to be factored in the perspective.
- Examining existing resources, however, SCA and the dynamic environment calls for exploring new resources as well.

Hence the need to extend the examination of SCA within the perspective of dynamic capabilities.

Dynamic capabilities theory extends the resource-based theory to view the competitive advantage rather than business performance. With dynamic capabilities theory, the external forces that impact the organisation are taken into consideration. The organisational learning capability is equally regarded as a critical element in enabling organisations to achieve competitive advantage. It is believed that an organisation has

achieved sustainable competitive advantage when its internal capabilities and agility deliver products or services to customers that cannot be duplicated by their competitors (Gowen & Tallon, 2005).

The notion of capabilities as a separate entity to resources came about in the early 1990s to understand the difference between value creating resources that can be regarded as capability (Weerawardena & Mavondo, 2011). It is believed that it is through these capabilities that organisations can enjoy competitive advantage. As pointed out earlier, the initial perspective of capability and competitive advantage strategy were based on resource based view. However, it soon became apparent that the environmental conditions are by no means static and as such the value of capabilities needs to sustain during volatile market conditions. This paved the way to the view of dynamic capabilities theory that center around flexibility and agility (Weerawardena & Mavondo, 2011).

Weerawardena & Mavondo (2011) believe that management innovation, be it technical or non-technical is a source of capabilities that can become competitive advantage. Central to their argument is that management innovation is the driving force behind sensing and shaping opportunities, weaknesses and threats while enhancing and honing intangible and tangible assets in building organisational strengths. Another aspect put forward by them is that dynamic capabilities are not operational capabilities; rather it is how the operational capabilities are working together in synergy that generates a certain dynamic capability. Although this perspective is well received within the academic community, it is still not extensively tested empirically.

Dynamic capabilities theory exerts equal emphasis on BPM which is the driving force in maximizing the internal capabilities of any organisation. Furthermore, process improvement initiatives are given due recognition in driving the required changes throughout the organisations processes and systems. Dynamic capabilities theory also stress the importance of effective feedback loops (Gowen & Tallon, 2005).

In addition, Trkman (2010) articulates the importance of strategic and structural alignments of the organisations in respect to the competitive environment. Achieving SCA can be explained through dynamic capabilities theory in which BPM is regarded as a best practise management principle. The following as critical success factors based on dynamic capabilities theory was revealed:

- A culture of continuous change.
- Appointment of process owners.
- Implementation of process changes or improvements.
- Adoption of change management for a continuous improvement system.

Trkman (2010) also suggests further research to gauge the role of process orientation in attaining a competitive position and determining the criteria for measuring success.

Kearns & Lederer (2003) believe that based on dynamic capabilities theory, BPM is the enabler to SCA by harnessing strategy, IT capability and IT investment to produce distinctive competency that can address the dynamic environment. The researchers view BPM as a capability on its own and should be riding on the existing IT capability since IT capability on its own would exist in all organisations. However, BPM on IT capability will be unique to an organisation per se. This covers one dimension of dynamic capabilities theory which is flexibility.

The other dimension to dynamic capabilities theory is agility. Agility can be viewed within the perspective of sensing capability and responding capability. In addition to that, proper alignment between sensing and responding is also important (Roberts & Grover, 2012). The outcome of their study on U.S. organisations indicated that there appears significant influence of agility on organisational performance and proper alignment of agility increases the organisational performance outcomes. Their findings in a nutshell reveal that greater organisational performance can be achieved by organisations who know customer needs, understand when the needs have changed and quickly respond in addressing those needs.

Dynamic capabilities theory in summary views the influence of capability and agility on sustainable competitive advantage. Within the context of this research on BPM, capability is measured through BPO while agility is measured through process improvement initiatives. Process flexibility is regarded under the aspect of capability (Soffer, 2004) and is explored within the context of dynamic capabilities theory as well to determine the level of influence of BPM. This formulates the overall link between dynamic capabilities theory with process flexibility, BPM and its components comprising of BPO and process improvement initiatives; and SCA.

2.2.2 Contingency Theory

The fit between business environment and BPM is explained within the context of contingency theory. Contingency theory articulates that there is no standard best practise within the management framework that can be applied across the board and that the optimal organisational style is highly dependent on various internal and external

constraints (Weill & Olson, 1989). The study of contingency theory revolved around organisational structure. Organisational structure was examined against organisational performance, influence of external environment, influence of technology and influences of organisational factors on structure. Contingency theory advocates that when a fit exist among the contingency variables, then the organisation can enjoy greater levels of performance. Among the contingency variables listed by Weill & Olson (1989) in their study are strategy, structure, organisation size, environment, technology, task and individual characteristics.

Empirical studies examining contingency theory typically involves cross-sectional surveys to determine the influence of contingency variables on organisational performance. Contingency theory centers around the need to discover a proper fit between strategy, structure, technology, organisation size and environment (Kearns & Lederer, 2004). The researchers noted that past studies on strategy and organisational performance based on contingency theory revealed a positive relationship among the variables. When technology is applied appropriately on key business strategies, then the outcome of organisational performance can be significantly higher. In addition, Kearns & Grover (2004) also suggest that IT investments on unique capabilities of the organisation can render to SCA.

This study follows Trkman (2010) with the perspective that articulates the two key attributes within contingency theory are strategic and structural alignments of the organisations in respect to the competitive environment against BPM programmes.

2.2.3 Task-Technology Fit Theory

The role of technology in enabling BPM programmes can best be explained within the context of task-technology fit theory. Task-technology fit theory explains that Information Technology (IT) has a higher probability of creating a positive impact on individual performance when matched correctly against the users tasks (Goodhue & Thompson, 1995). The researchers explain that past researches were focusing heavily on comparing the fit between the impact of graphs versus tables, while there were related studies that suggested that mismatch between data and its representations would slow-down the decision making process. In their study, the researchers attempted to explore the relationship between information systems (IS) covering systems, policies and IS employees with performance, suggesting that the performance will be significantly higher when matched correctly with tasks and requirements of users. Their proposed model has close interactions with task, technology and individual. Their study compared 2 different companies. Based on their findings, it was discovered that task-technology fit does have an impact on performance. The study by Goodhue & Thompson (1995) has been widely modified and expanded to cover beyond the individual level to the organisational level.

Trkman (2010) explains that task-technology fit theory and dynamic capabilities theory are close-knit. It is argued that IT investments and IT capability can be seen as effective when in alignment with BPM programmes. In addition to that, IT investments are also perceived as an enabler for process change or improvement initiatives (Teng et al., 1996).

2.3 Variables under Study

The variables involved in this study are categorised into four groups. There are four independent variables, one mediating variable, one moderating variable and one dependent variable. The following table depicts the variables according the above mentioned categories:

Table 2.1: List of Variables under Study

Independent Variables	Mediating Variable	Moderating Variable	Dependent Variable
Structural Alignment	Business Process Management	IT Investment	Sustainable Competitive Advantage
Strategic Alignment			
IT Capability			
Process Flexibility			

2.3.1 Organisational Factors

In addition to determining the relationship between BPM and SCA, existing research also suggests examining the effects of organisational factors on BPM in driving sustainable competitive advantage. This study focuses on four organisational factors, structural alignment, strategic alignment, IT capability and process flexibility.

Structural Alignment

In recent years, organisations have shifted the structure of their organisation from vertical to horizontal. The change in focus allows the employees to be more empowered and facilitates teamwork across departments. This move coincides with BPM which propagates cross-functional teams. Structural alignment advocates that the structure and style revolve around the core processes. It is agreed that structure and processes come together to support the strategic direction of any organisation in meeting customer demands (Hung, 2006). In addition to that, process improvement initiatives are also believed to be closely related with organisational structural alignment (Kettinger & Grover, 1995).

One type of organisational structure is the matrix structure. Matrix management is about layering one or more levels of departments on top of an existing form, hence the name matrix structure (L. R. Burns & Wholey, 1993). The researchers explain the matrix structure based on information-processing theory and network and institutional theories of innovation. They argue that organisations create structure and strategies to match the information processing capability. The results of the study conducted on 1375 hospitals in U.S., suggests that matrix structures work well with organisations aiming at continuous quality improvement indicating that improvement teams is a matrix to the existing department structure. However, the researchers also cautioned that further studies are required to determine if matrix structure contributes towards greater business performance.

Although BPM has the potential to overcome departmental barriers and drive the organisation to focus on customer needs (Sever, 2007), it can only be effectively executed when the structure allows for process management and improvements to run horizontal across the departmental structures. Therefore, it is necessary to have alignment of BPM with the structure and to ensure that the structure of the organisation is capable of supporting BPM activities.

Structural alignment can be explained as the level of synergy between organisations design, strategy and culture in achieving the desired objectives. Any misalignment is believed to result in inefficiencies and ineffectiveness. Structural alignment interrelates very closely with BPM in respect to enable organisation's system, process and people to function in harmony (Semler, 1997). The researcher stresses that based on the theory of organisational alignment, it is crucial for purpose, objectives, strategy, structure and culture to work in harmony in order to increase organisational effectiveness. He also explains that quality and process movements are closely related with the element of alignment since it is considered as the means to achieve the desired business outcomes. Structural alignment is believed to be an enabler to drive greater impact of BPM and BPO. Semler (1997) suggests future researchers to explore the relationship between structural alignment on organisations success or in the context of this research, its competitive advantage position.

Strategic Alignment

There are many activities that are required to be carried out by organisations in order to survive and remain competitive. In order for BPM to be effective, there has to be top management commitment that are clearly defined and linked with the organisations strategy (Jeston & Nelis, 2006). Strategic alignment requires organisations to deploy all resources to execute the crafted strategies in a manner that delivers results.

In order for strategies to be executed successfully, the employees need to understand the business strategic objectives and translate them to operational objectives. Once this is done, then the structure, processes and systems must be adjusted to deliver the required results (Rondinelli, Rosen, & Drori, 2001). Neubauer (2009) and Trkman (2010) advocate that there needs to be systematic alignment of BPM with strategy. Both researchers further suggest research to be carried out to empirically determine the effects of strategy on BPM and technology.

In order to stay relevant and competitive in the market, organisations are expected to align their strategies along their capabilities, leadership skills and changing environmental conditions (Beer, Voelpel, Leibold, & Tekie, 2005). In order for well-crafted strategies to be executed effectively, it is recommended that organisations constantly align and fit the crafted strategies to cater for the changes that are taking place surrounding the organisation. Although the idea of alignment and fit is not new, the researchers have acknowledged that misalignment still occurs. They propose organisations to follow through a Strategic Fitness Process (SFP). Based on their study conducted on 23 organisations that practiced SFP, they pointed out that it is not only important to craft winning strategies, it is also important to ensure that the organisations

possess the required capabilities that fit with the crafted strategy. Only then can organisations have a fair chance to successfully implement the strategy. The researchers cautioned that many failed implementations for organisational efficiency is due to the lack of an integrated approach across all the key elements in an organisation, namely people, processes and systems while not forgetting other important elements such as communications, culture, coordination and leadership.

A recent study was conducted by Joyce & Slocum (2012) to determine the relationship between strategic alignment, senior management capabilities and financial performance of organisations. The study put forth the argument that financial performance can be achieved when there are good strategy, proper strategy execution, horizontal structure, positive culture and talented senior management team (Joyce & Slocum, 2012). A key take away from their study is that successful organisations institutionalise their strategic capabilities through people, processes and systems of their organisation.

Crafting a distinctive strategy is the first crucial step in achieving organisational success and creating competitive advantage (Porter, 1985). Next step to success would be the implementation of the well-crafted strategy. However the plans that are formulated to achieve the strategies should not be cast in stone. It is a living document that undergoes constant reviews and changes by responding to environmental changes that is reviewed by top management with feedback from the middle management who govern the operational activities of the organisation (Beer et al., 2005).

The decisions for exporting to foreign countries and global expansions make strategic alignment activities more challenging than it already is for organisations (Rondinelli et al., 2001). The researchers conducted extensive interviews with multinational companies on the challenges with maintaining strategic alignment under international conditions. Their findings reveal that there is a constant need to review and adjust business strategies, organisational structure and processes according to the business conditions, cultural diversity and economies of countries in which businesses are operating. It is evident that even strategic alignment can be highly complex when business operates in a complex platform. Even organisations operating in local markets must realise that strategic alignment is a continuous effort and not a one-time exercise to develop strategies. The researchers aptly conclude that strategic alignment is a continuous process that requires top to bottom buy-in from employees, driven by strong leadership and executed in a platform that is flexible to accommodate the required changes to structure, systems and processes.

IT Capability

Bharadwaj (2000) define IT capability as the ability to operationalize the organisation's IT resources in synergy with other resources and capabilities. Organisations with sound IT capability are believed to enjoy greater performances as opposed to organisations with lesser IT capability (Bharadwaj, 2000). At the same time, she cautions that studies also reveal that high IT investment does not necessarily bring significant benefits. This implies that while IT capability can be a service differentiator, it does not warrant huge amounts of investment. It concerns the organisation's ability to create core competency from IT.

The study conducted by Bharadwaj (2000) examines the relationship between IT capability and organisational performance by applying resource-based view theory. It was revealed that IT capability is very much organisation specific, thus difficult to imitate or substitute. Hence, IT capability can be a strong contributor towards SCA. The study indicates that there is significant relationship between IT capability and organisational performance. She suggests future researchers to improve the measurement instrument of IT capability since her study focuses on rankings of IT leaders as an indicator of superior IT capability.

Porter (1985) point out that IT capability can only be considered important if it can create value in developing the organisations competitive advantage. He believes that IT capability and IT investments needs to be focused along the key value chain activities of the organisation in order to drive cost differentiation or product differentiation to create a unique driver for the organisation. The following situations may create a positive outcome for SCA using IT capability when:

- IT capability lowers costs or enhances differentiation.
- The enhancement creates uniqueness.
- The IT capability pioneers the organisation to enjoy first mover advantages.
- The IT capability transcends on to the industry playing field and alters the industry structure.

Pondering over the above points, Porter correctly points out that IT can potentially improve or erode the overall industry attractiveness and competitiveness, since IT can influence competitors' entry barriers, buyer power, supplier power, substitution, rivalry, entry or even exit boundaries.

A recent study conducted in Taiwan explored the effects of IT capability and service process innovation on organisational performance through superior customer service with resource-based view as the underpinning theory (J.-S. Chen & Tsou, 2012). Their findings brought to light that IT capability does impact service process innovation and customer service and customer service mediates the relationship between IT capability and organisational performance.

Prior to the above, another study was conducted to examine the context of IT capability more closely – internally and externally focused to determine which had greater influence over organisational performance when moderated by environmental conditions (Stoel & Muhanna, 2009). They concluded that there were instances when internally focused IT capability rendered greater influence over organisational performance. There were also other instances when it was externally focused, IT capability rendered greater influences. It appeared that when the environmental conditions were highly dynamic, externally focused IT capability was more significant. The main contribution from the study indicated that demands of the environment influenced the impact of IT capability.

Law & Ngai (2007) strongly believe that IT capability can render greater competitive advantage in organisations whereby the top management consists of senior IT executives since it is the top management that can ensure the continuous renewal and relevance of IT capability within the organisation. In an extension to the study, another study on Taiwan companies revealed that IT-enabled resources, be it people or otherwise renders greater organisational capabilities in order to achieve greater organisation performance with resource-based view as the underlying theory (J.-L. Chen, 2012).

The relationship between IT capability and IT investment on organisational performance was examined in another study, specifically the moderating effectiveness of IT capability between IT investment and organisational performance (Liu, Lu, & Hu, 2008). The study on organisations in China was based on resource-based view revealed that IT investment affects organisational performance indirectly when moderated by IT capability.

IT capability can also be viewed as an enabler for improving access and coordination across organisations (Attaran, 2004). IT capability should be designed and implemented to support business processes since it has the potential to deliver a host of benefits in effecting process change and improvements. However, there has to be visionary strategy in order for IT capability to be successful, otherwise, transformational change may not be materialised due to lack of allowances of innovative practices.

In a study conducted in Israel, it was observed that IT capability was not significant in influencing strategic alignment and competitive advantage (Fink & Neumann, 2009). The explanation provided was the possibility of lacking business skills of the IT personnel in creating business value out of IT capabilities. Their contribution towards the body of knowledge on IT capability brought to surface the crucial aspect of business skills among the IT employees.

A relatively recent study set out to determine the relationship between competitive strategies and organisational performance and the moderating effects of IT capability based on Spanish organisations (Ortega, 2010). Her results revealed that competitive strategies and IT capability have positive influences on organisational performance and IT capability does moderate the relationship between competitive

strategies and organisational performance. Her study applied market orientation as the control variable. It appears that IT capability is greater enjoyed by organisations operating in a highly competitive and dynamic environments.

Aral & Weill (2007) developed an extensive measurement instrument for IT capability and examined the moderating effects of IT capability on organisational performance. Their study too concurs with Bhardwaj (2000) that IT capability enhances IT investment and organisational performance. Bharadwaj (2000) also recommended identifying the full connection between IT capability to performance and how IT capability can be leveraged to increase competitiveness. As such, this study examines how IT capability through BPM can increase sustainable competitive advantage.

Process Flexibility

The concept of flexibility came about in response to organisations slacking due to traditional bureaucratic and rigid structures. Flexibility can be regarded as the ability of organisations to respond swiftly to unplanned events around the business environment covering many dimensions namely market responsiveness, resilience, agility, versatility and adaptiveness while cutting across different components of an organisation such as strategy, process, structure and systems (Tienari & Tainio, 1999). The volatile environment called for changes in the management paradigm and forced organisations to re-evaluate their systems, processes and structures. Tienari & Tainio (1999) examined a Finnish Bank's effort in transforming to become a flexible organisation. Based on their findings, top management regarded flexibility in relation to organisation structure while the middle management regarded flexibility within the

context of business processes so that disturbances can be absorbed into operational activities.

Process flexibility can exist along the dimension of time and can be categorised as short-term flexibility or long-term flexibility (Soffer, 2004). Short-term flexibility is the ability to handle exceptions while long-term flexibility is about the ability to change or improve existing processes or introduce new processes.

Process flexibility within an organisational environment exists when current processes can be adapted or changed to cater to new environmental conditions or to achieve better competitive advantage (Soffer, 2004; Stohr & Muehlen, 2008). Soffer (2004) also articulates that process flexibility can be associated with exception handling. Though process flexibility originated from the manufacturing sector for addressing production capacity, it is now a phenomenon observed in the services industries too (Chou, Chua, & Teo, 2010). The researchers regard flexibility within the context of range and response. Range can be explained as the extent to which the organisation can accept the required change while response can be explained as the speed in which the organisation can adapt to the changes. Range indicates that not all organisations can fully absorb into their operational activities the change which is required. There may be many forms of limitations that hinders organisations such as technology, product development, market focus and most importantly cost. Response on the other hand indicates that organisations need time to adapt to the changes even if the organisation is able to fully comply with the changes that are required.

Another view of process flexibility is the ability to strike a balance between continuous change while maintaining stability without the risk of compromising on losing the organisations identity (Regev, Bider, & Wegmann, 2007). The researchers also explain that one of the causes for process inflexibility is the people aspect and resistance to change. Process flexibility is closely associated with BPR as both these concepts advocate change and the efforts in managing those changes for the greater benefit of the organisation (Aggarwal, 1995; Yung & Chan, 2003). Aggarwal (1995) stresses that BPR and other improvement initiatives are simply mechanisms in enhancing the flexibility of processes in an organisation. Flexibility is attained when BPR and other PII activities are performed without incurring too much cost, time, effort and disruption to the organisations performance (Sanchez & Perez, 2005).

Hong & Kim (2002) examined process flexibility within the scope of process adaption level and reported that organisational fit on ERP was not moderated by the level of process adaption on ERP implementation success. Their study focused on technological aspects of ERP implementation and its relationships with organisational factors and ERP success. It was observed that ERP implementation was likely to be independent of process flexibility (Hong & Kim, 2002). However, in this study, the view of Trkman (2010) is taken into consideration whereby it is believed that process flexibility is very much needed and influences the outcomes of effectiveness of BPM.

Trkman (2010) regards process flexibility as a necessity to ensure process changes or improvements can be adapted to business processes based on the demands of the business environment. Process flexibility is a widely researched phenomenon under the supply chain paradigm. However, process flexibility is gaining relevance and popularity in recent BPM related articles. To-date, there is no suitable measurement

instrument available to research process flexibility that can be applied to both manufacturing and services industries. This study aims to develop a suitable measurement instrument for process flexibility and further examine its influence over process improvement initiatives.

IT Investment

Practitioners have capitalised on IT in sustaining their competitive advantage by practising the “create-capture-keep” paradigm that has received equal support from academicians (Mata, Fuerst, & Barney, 1995). The study was based on strategic management theory to determine if IT can influence the creation of SCA. The researchers believe that sources of IT using resource-based view are access to capital, proprietary technology and managerial IT skills. It is observed that in order to gain superior results from their IT investment, the role play of IT managerial skills is an important component. In the sense, they believe that it is the IT managerial skills that can influence the IT capability to create competitive advantage for the organisation. The importance of IT in accelerating competitive advantage is believed to be more effective when driven strategically whereby technology can be applied to product or process enhancements (Porter, 1985).

As mentioned earlier, IT investments would be considered successful in an organisation when the organisation has managed to reap increased levels of efficiency and flexibility from the investments (Kim, Jang, Lee, & Cho, 2000). The researchers quickly point out that another critical aspect is the proper alignment to business strategy explaining that in reality organisations have limited financial resources at their disposal,

hence it is advisable to invest on areas that yield the greatest impact to business strategy. Although this line of reasoning is logical, however, many organisations fail to make IT investment decisions in this manner. Therefore, the researchers proposed a decision path analysis by cleverly applying the Quality Function Deployment (QFD) framework into the decision making process.

An interesting examination of the impact on IT investment on organisational performance was conducted in a research on the impact of previous year's IT investment on current year's organisation performance (Hu & Plant, 2001). This was indeed an interesting study as the researchers argued that previous studies of IT investment on organisation performance was flawed as the impact of IT investments can only be realised in the future and not immediately within the same fiscal year. They correctly point out a fundamental statistical concept that correlation does not necessarily imply causation. The researchers put forth their research gap that previous year's IT investment can increase current year's sales, reduce current year's operating cost and current year's productivity however current year's IT investment can only impact current year's productivity but not sales and operating cost. In addition to that, it is believed that productivity is improved through IT investments on process improvements. The findings from their research indicated no evidence to support the claim that IT investment (whether previous or current year) have significant impact on organisational performance, be it sales, operating cost or productivity.

In addition, Walsh et al. (2010) argue that IT investment can be regarded as a critical resource component based on resource based view theory, implying the size of IT investment can yield competitive advantage. From the point of view of dynamic capability theory and task technology fit theory, IT investment can be regarded as the

ability to allow firms to link differentiated functions together for increased efficiency and quicker response to market changes. Therefore, the greater size of IT investment, the greater the coordination of resources through economies of scope and economies of scale (Walsh, Schubert, & Jones, 2010). Interestingly, a contrasting view was observed by Bharadwaj (2000) who points out that IT investment yields mixed results on organisational performance since regardless of the size of investment, it is the organisation's capability to manage its resources effectively that translates into a competitive advantage.

IT investments can be categorised as transactional, informational, strategic and infrastructure (Weill & Aral, 2006). The researchers in their study explain that in order to reap the maximum benefit of IT investments, all categories need to be balanced and constantly reviewed for relevance. The study conducted a year later proved that organisations with stronger IT capabilities tend to enjoy maximum benefits of their IT investments (Aral & Weill, 2007).

In addition to that, Trkman (2010) and Neubauer (2009) believe that IT investment on its own may not be sufficient in creating the expected impact if not properly aligned with its BPM programmes. The processes also are expected to undergo necessary changes or improvements to meet the demands of strategic decisions and IT investments.

Finally, Walsh et.al (2010) suggests future research to examine the mechanisms that link between IT investment and performance outcomes. Within the context of this study, the role of IT investment in enhancing the influence of BPM on SCA is explored.

2.3.2 Business Process Management (BPM)

BPM can be categorised under the umbrella of modern management (Goldkuhl & Lind, 2008; Lee & Dale, 1998; Zairi, 1997). Central theme to the concept of BPM is the management and improvement of processes as organisations have accepted that a process-based approach in executing operational activities can bring about a certain degree of consistency and create a common language across the organisation. Adopting the customer focus element from TQM can be applied to BPM in such that processes are executed to ensure customer needs are met and satisfied. In addition, improvements to processes are also carried out for the same reason.

Zairi (1997) explains that there are four key features to any process as outlined below:

- Inputs that are defined and predictable such that the inputs are consistent.
- A flow of activities that are linear and arranged in a logical sequence.
- Activities along the flow that are clearly defined.
- Outputs that are predictable and in accordance to customer needs.

As such, the objective of BPM is to put in place the necessary platform for ensuring processes are functioning at its optimum and there are avenues for improvements along the activities as required by the customer or the internal stakeholders. BPM ensures that operational activities are carried out in a structured manner, improvements are based on scientific approach by collecting data and applying analytical tools, appropriate investments in technology, innovative approach to managing customer needs and cross functional across departments for integrating the management of an entire organisation (Lee & Dale, 1998). The researchers further describe BPM as the “business

architecture” of organisations to function effectively. Again, it can be observed the adoption of winning features of TQM and BPR.

As the management of processes is embedded into daily operational activities of organisation, the importance of linking processes with people and systems became evident (Davenport & Beers, 1995). In addition, the importance of process information surfaced as a potential area of interest since the TQM movement. The importance of process information is carried through to BPM as well as the most effective way to instil improvement lies within the information about the process either in terms of performance or lessons learnt. The information needs to be fed back to the start of the process in order to facilitate process improvements. Davenport & Beers (1995) also admit that organisational culture plays an important role in the effectiveness of process information management.

There are many benefits in moving from beyond a functional organisation to a process-driven organisation as outlined by Sever (2007). Among them are:

- Improved communications across the organisation.
- Clearly defined inputs, outputs and work activities.
- Better understanding of the end-to-end flow of activities until the product or service reaches the customers.
- Informed decisions made through tracking of process performance.
- Improved people management as the process culture focuses on raising the bar on performance.

In creating a process driven organisation, the following key attributes need to be available (Neubauer, 2009):

- Processes aligned to strategy.
- Measurement controls to measure support and measure the alignment.
- Implementation of process improvement activities.
- Documented processes with clearly defined process owners.
- Adequate allocation of IT resources in terms of investments, capabilities and resources.

BPM advocates bringing together the three main elements of any organisation – people, process and technology. Management level within any organisation is focused on improving operational efficiency in order to control business outcomes to ensure it achieves the business objectives and customer needs. BPM aims at ensuring processes are streamlined and improved to address the organisations strategies. In order for BPM initiatives to be effective, there has to be top management commitment and clearly defined link towards strategic objectives of the organisation (Jeston & Nelis, 2006). In addition to that, IT capability can be infused to BPM in order to create greater efficiency and effectiveness (Vergidis et al., 2008).

In investigating the status of BPM among organisations moving towards a process-driven structure supported by strategy and IT capability and IT investments, Neubauer (2009) observes that organisations still have limited understanding on the potential of BPM and even lesser efforts are in place to fully implement BPM.

There are substantial amount of literature available with regards to process automation and workflow management systems. These research papers provide an array of analysis of BPM within the perspective of Business Process Management Systems (BPMS) in comparison with system flexibility, policy making, policy implementation, employee behaviour and operational performance (Gong & Janssen, 2012; Huang, Lu, & Duan, 2012; Lu, Sadiq, & Governatori, 2009; Niehaves, Plattfaut, & Becker, 2013; Shaw, Holland, Kawalek, Snowdon, & Warboys, 2007). However, these studies purely look into BPM as processes regardless if the processes are executed manually or automated.

BPM in Practice

Based on the study conducted by Vergidis et al. (2008) on the services industry, it is revealed that most services organisations had organisation structures that were very much based on the traditional structure. Departmental segmentation however, had cross functional teams based on business processes. Their study revealed that almost two-thirds of organisations practices matrix structures. In addition, their study also revealed that the level of automation of business processes were industry specific with banking and financial industries spending greater efforts on process automation as compared to public sector and education. The researchers strongly believe that in order to enjoy greater benefits of BPM, organisations need to move away from matrix structures and attempt to establish a process-centric structures. In addition to that, organisations also need to conduct process automation based on organisational business needs rather than availability of software suites on the market.

In a case study examining the impact of BPM on organisational performance, it is observed that BPM has to be viewed from a strategic level (Armistead, Pritchard, & Machin, 1999). The proposed organisational framework of BPM encompasses strategy, organisational design and coordination, market value chain, performance management and knowledge management. These elements are identified as the critical enablers that exist in companies that have successfully implemented BPM.

BPM is regarded as best practise management principle and an enabler for organisations in sustaining their competitive advantage (Hung, 2006). In his research, Hung examined BPM within two constructs – process alignment and people involvement and empirically tested the relationships between process alignment and people involvement on organisational performance. The research was based on several theories – systems theory, organisational theory, alignment theory and strategic theory. Process alignment consisted of horizontal structural alignment, IT alignment and strategic alignment. People involvement on the other hand consisted of executive commitment and employee empowerment. The outcome of the study demonstrated that process alignment and people involvement are positively associated with organisational performance. The study also indicates that when systems, processes and people come together in alignment, it can harness an organisation's performance.

When examining companies that had implemented TQM, BPR and Benchmarking, it was discovered that BPR initiatives produced the greatest impact on organisational performance (Lok et al., 2005). Strategy plays the most critical role in effective process improvement initiatives while structural and IT alignments did not statistically create any significant impact on process improvement initiatives. The

major contribution by Lok et al. (2005) was to view BPM within the perspective of process improvement initiatives covering TQM, BPR and Benchmarking.

A study on a Swiss bank indicated that the successful implementation of BPM and its impact on organisational performance was realised through process improvement efforts and IT implementation (Kung & Hagen, 2007). This resulted in dramatic improvements to performance and process quality. Similar results were observed in a case study of an Italian public sector responsible for issuing business licenses to entrepreneurs. BPM was adopted through process management, alignment with organisational structure and IT, process improvement and people empowerment and resulted in a significant improvement on delivery time (Ongaro, 2004). On the other hand, a case study on the implementation of BPM in a Brazilian public research centre highlighted culture and behavioural aspects as major challenges towards ensuring a successful implementation of BPM (Sentanin, Santos, & Jabbour, 2008).

The level of BPM implementation and practice within organisations can differ vastly. This variance may be due to internal or external factors. The level of BPM maturity in organisations can be low, medium or high and is very much influenced by the level of attention paid by the organisation on BPM (Bucher & Winter, 2009; Skrinjar & Trkman, 2013). In addition to that, the level of BPM maturity can also be distinguished through the process types, be it standards-based which can be considered on the lower end while custom-made which can be considered at the higher end of BPM maturity.

The methodologies of BPM can be assessed and evaluated using goal based approach or goal free approach that can be qualitative or quantitative (Filipowska, Kaczmarek, Kowalkiewicz, Zhou, & Born, 2009). The researchers outline an evaluation procedure for organisations to assess the various BPM methodologies to determine the best fit within their organisation.

In reviewing the critical success factors of BPM, Trkman (2010) summarised that in order for BPM initiatives to be successfully implemented, there has to be leadership commitment, effective project management, clear communications, teamwork across departments, adequate training for employees and the effective application of IT investment and capability. He also believes that the critical success factors of BPM can be explained through dynamic capabilities theory, contingency theory and task-technology fit theory.

Within the context of this study, BPM is viewed through two constructs which are Business Process Orientation (BPO) and Process Improvement Initiatives (PII). The reason this study takes on this view-point of BPM is because BPO looks into the management aspect of processes while PII looks into the improvement or changes of the processes. This provides a total view-point of BPM.

Business Process Orientation (BPO)

Over time, the level of BPM in organisations was evaluated by measuring the level of process orientation. Key attributes of process oriented organisations are the existence of end-to-end business process designs and the discipline to measure and

manage process outcomes that are geared towards customer goals rather than functional goals (Neubauer, 2009; Skrinjar & Trkman, 2013). The concept of process orientation was introduced by Michael Porter almost 25 years ago whereby he proposed a concept of interoperability across customer touch points as critical to organisations. Later, W. E. Deming enhanced the concept of process orientation with the Deming Flow Diagram (McCormack, 2001). Process orientation is crucial in organisations in order to break away from functional or departmental silos, improving communications among employees and reducing rework when many departments are involved in a process (Sever, 2007). Process orientation enables organisations to think collectively as one unit about increasing their efficiency in meeting customer needs. Process thinking is described as cross functional and outcome oriented with emphasis on business processes, jobs and structures, management and measurement systems and finally value and beliefs.

This forms the basis of BPO developed by McCormack (2001) which consists of the following:

- Process management and measurement – components that measure output quality, cycle time, process cost and variability.
- Process jobs – the identification of a process owner rather than functional manager.
- Process view – documentation of end to end processes.

Measurement instrument for BPO was developed by McCormack (2001) in his study on domestic and international manufacturing companies. The study revealed that organisations practising higher levels of BPO tend to enjoy better business performance. In addition, organisations practising higher levels of BPO tend to have employees who

display greater levels of teamwork and engagement. In conclusion, the study recommended future researchers to examine the behaviour and patterns of BPO in the services industry as well to determine if the situation was similar or different.

In addition to the study conducted in 2001, there were also two other studies conducted by McCormack in 2004 and 2005. In 2004, his study explored the relationship between BPO and supply chain maturity. The study collected data from 90 firms revealed that supply chain maturity was not significantly associated with organisational performance (Lockamy & McCormack, 2004). The study in 2005 extended the view of BPO into building high level business processes for organisations in order to achieve competitive advantage. A case study was conducted based on cognitive mapping technique and principles of modularity on Centex Rooney of Florida and was effective in creating a top down approach that links customer requirements to operational activities (McCormack & Rauseo, 2005).

The BPO measurement instrument developed by McCormack (2001) was further refined and applied to determine the impact on overall business performance by measuring the dimensions of financial indicators and non-financial indicators (Skrinjar, Bosilj-Vuksic, & Indihar-Stemberger, 2008). These researchers studied the impact of BPO specifically in a transition economy. The study was conducted in Slovenia and Croatia on organisations with more than 50 employees. Their study revealed that BPO has a direct impact on non-financial performance and an indirect impact on financial performance. The indirect impact to financial performance was observed through non-financial performance. As such, it was concluded that organisations practising higher levels of BPO tend to enjoy greater financial and non-financial performance.

From the literature, it can be observed that BPO has been discussed and empirically tested in past researches with emphasis towards its influence on organisation performance. The theoretical basis for past researches was based on systems theory, contingency theory and resource-based theory. However, BPO within the context of dynamic capabilities theory and its impact on sustainable competitive advantage has not been researched before, hence forms an appropriate area of research.

Process Improvement Initiatives (PII)

Organisations implement process improvement initiatives for the purpose of addressing the shortcomings identified in their overall performance and to fulfil the need to sustain their competitive advantage. Common process improvement initiatives adopted by organisations can be identified as TQM, BPR or Benchmarking (Lok et al., 2005). It is believed that process improvement initiatives conducted in a continuous and consistent manner can result in higher levels of process maturity and transcend the focus of processes for inward-looking to outward-looking such that the focus becomes more on customer needs and requirements (Lockamy & McCormack, 2004).

Regardless of the tools and methods applied to improve processes, the effort is always steering the process in the right direction in order to satisfy customers. The nature of process typically entails simplification, improvement, re-engineering or redesign in the quest to increase productivity, product quality and operations. Zairi (1997) outlined the following critical steps in process improvement initiatives:

- Identification of process customers.
- Identification and understanding of customer requirements.
- Clearly defined output that is based on customer needs.
- Translation of customer requirements into supplier specifications i.e. defining the input requirements.
- Defining step by step approach as to how the output will be achieved
- Identification of appropriate measurements to measure process performance for the use of continuous improvement and control.
- Determination of process capability to meet customer requirements.
- Track performance through collection of process results and relate back with the process objective in meeting the customer requirements.
- Documenting lessons learnt to ensure that mistakes are not repeated in the future.

In addition to that, it is also crucial to identify and understand the business needs through competitor analysis, internal and external environmental analysis, SWOT analysis and stakeholder analysis (Adesola & Baines, 2005). This step is necessary to ensure that resources channelled for process improvements are within the business and industry context.

It is observed that process improvements are best carried out once thorough analysis of the process is completed. This is done primarily to understand the strength and weaknesses of the processes to narrow down on the critical weak points that need to be improved (Coskun, Basligil, & Baracli, 2008). It is believed that process analysis can

be enhanced by IT, however the ideas and mechanisms for improvements are still derived from the employees that actually execute the process.

One of the biggest challenge both in BPM and PII is that the improvements if not linked to strategic outcomes can be plagued as a burden (Lepmets, McBride, & Ras, 2012). The researchers discovered that it is difficult to question a long established system since it is so deeply integrated within the organisation that any change or improvement can be difficult to impose. Likewise with regards to IT capability, the researchers note that the systems may have become so large, complex and interconnected that imposing radical improvements are difficult to implement. Another major area of concern is the organisational structure which was seen as operating from departmental perspective but slowly moving in the matrix direction. However, many organisations have admitted the move to process-based structure may be inevitable.

Another approach to PII is based on task activity analysis, bottleneck analysis, cycle cost analysis and resource utilisation analysis (S. Lee & Ahn, 2008). This process improvement put forth is based on an assessment model capitalising on the available IT resources within the organisation to drive organisational change. The model was applied to a telecommunications company in South Korea in a successful manner. The organisation reported clearer understanding of processes, significantly lower costs, mild resistance to change and fast implementation of change activities. This implies that organisations keen on driving organisational change through process improvements can succeed if they are willing to apply consistent tools and methods. Weber, Markovic & Drumm (2007) conducted similar researches in developing web-based solutions for BPM.

There were few researches carried out that brought to surface that while process improvement initiatives delivered significant improvements to processes, however did not result in significant improvements in organisational performance (Siha & Saad, 2008). Based on their study, the researchers outlined the following as critical success factors to the outcome of process improvement initiatives:

- Top management involvement and commitment in driving the initiatives.
- Strategic alignment such that the outcomes must be tied back to corporate level strategic objectives.
- Process improvement project that encompass the major activities of the business.
- Communication and change management for employees to understand the impact of the change to the work processes.
- Tracking and evaluation of performance through measurements.
- Sustainability of the improvements such that the performance of the process does not regress back to the old ways and to ensure that the improvements were not by chance but real in delivering improvements.

A study conducted in Singapore by Ranganathan & Dhaliwal (2001) on the implementation of BPR initiatives revealed the most common problems associated with BPR implementation were as follows:

- Inadequate human and financial resources.
- Inadequate IT capabilities or expertise in the firms.
- Lack of support of organisational members for BPR efforts.
- Lack of champion for BPR effort.
- Challenges in gaining cross-functional cooperation.
- Challenges in identifying the right processes.
- Inadequate organisational structure that facilitates change.
- Lack of strategic plan or vision.

Lee & Dale (1998) in their study recommended that BPM can be effective by integrating continuous improvement, BPR and benchmarking through cross functional process oriented management. This forms the basis of including process improvement initiatives as a component within BPM. PII can be regarded as a dynamic capability (Anand, Ward, Tatikonda, & Schilling, 2009). Their study is based on organisational learning theory and proposed a conceptual framework that links purpose of improvements to people and process elements of the organisation.

The importance of linking people to BPM or PII is not new. Ranganathan & Dhaliwal (2001) conducted a study in Singapore. It was evident among the respondents in the survey that the take up rate and level of awareness of improvement activities were high (Ranganathan & Dhaliwal, 2001). The dynamic changes in the external environment is forcing organisations to forge through BPR and other improvement initiatives despite mounting challenges in order to defend or capture greater market share.

2.3.3 Sustainable Competitive Advantage (SCA)

SCA has its roots from dynamic capabilities theory and resource-based theory. The underpinning notion of SCA and dynamic capabilities theory suggests that organisations can create competitive advantage based on its distinctive or core capability (Kearns & Lederer, 2003; Weerawardena & O'Cass, 2004). It is believed that every organisation is capable of acquiring and cultivating resources that is difficult to replicate (Kearns & Lederer, 2003). Hence, each organisation has the potential to build SCA.

SCA is important as it enables organisations to develop distinctive capabilities to deliver products or services to its customers that are unique to their competitors (Leskovar-Spacapan & Bastic, 2007). The researchers go on to illustrate that maintaining SCA is a continuous effort. In an effort to build core or distinctive capabilities, organisations can utilise its technology, complementary assets, resources or organisational work processes that is fundamental to the organisations core business or delivery to customers.

SCA can be regarded as the mechanism that fully maximises the organisations resources in exploiting the current business opportunities while exploring other resources in ensuring sustainability of its competitive position for the future based on durability, mobility and replicability (Chaharbaghi & Lynch, 1999). Hence, sustainability is considered to be a dynamic process rather than static and requires organisations to embrace change positively.

SCA allows organisations to reach out or secure a better market share. In another words, capabilities done extremely well, to the extend, better than competitors are consciously developed and improved such that it creates a competitive advantage that is valuable, rare, difficult for competitors to duplicate or substitute with another capability. These capabilities could be in the form of people, processes, systems or even strategy formulation. Organisations that have successfully gained SCA tend to adopt specific strategies such as innovation, improved processes, superior quality or lower cost (Rijamampianina et al., 2003). However, what is even more difficult is sustaining the competitive advantage that has been created. This requires constant test of fit and reconfiguration to key work activities to beat the rivals. When competitive advantage is created, organisations can strive to move for sustainable competitive advantage and after that organisations can enjoy greater or improved business performance.

In the past, physical assets were closely linked to SCA, however in today's level of market liberalisation, it is knowledge assets that are linked to SCA. The very nature of knowledge assets is that it cannot be procured rather is something that has to be developed within the organisation and prevails within the structure and processes (Teece, 2000). With that realisation comes the concern of effective knowledge transfer to ensure that organisations can increase effectiveness and core competence. Knowledge that is trapped in employees or systems and not made available at the right time to the right people is of minimal value. This has cost implications which organisations have yet to be able to fully quantify. This is where the importance of correctly applying IT capability and making the appropriate investments to ensure knowledge is readily available when required.

Barney (1991) believes that firm resources are a source for achieving sustainable competitive advantage and suggests four attributes to be acquired by any organisation intending on gaining sustainable competitive advantage. The first attribute is value with the capacity to exploit opportunities and neutralise threats. The second attribute is the element of rareness amongst current and potential competitors. The third attribute is inimitability whereby it poses extreme difficulty for current and future competition to duplicate their strategy either due to high cost or complexity. The last attribute is nonsubstitutability which illustrates that even if the competition manages to imitate a strategy, it will not be possible to substitute the resources with similar resources. Barney explains firm resources as rare and valuable resources that potentially deliver competitive advantage. After a decade had passed, a revisit of the article published in 1991 still proved relevant and worthy in measuring sustainable competitive advantage (J. B. Barney, 2001). These attributes forms the dimensions that will be used in this study to measure SCA.

SCA in Practice

The outcome of a study on Australian organisations revealed that firm resources play an important role in increasing organisational performance while industry structure failed to indicate any influencing factor over organisations competitiveness (Galbreath & Galvin, 2008). Based on the study, the importance of firm resources is fortified in explaining the strategic management focus of internal or external forces for competitive advantage.

Practitioners have capitalised on information technology in sustaining their competitive advantage by practising the “create-capture-keep” paradigm that has received equal support from academicians (Mata et al., 1995). The key to creating SCA is when organisations can create a competitive advantage such that it is difficult and pose disadvantages for competitors to duplicate or replicate. The importance of information technology in accelerating competitive advantage is believed to be more effective when driven strategically whereby technology can be applied to product or process enhancements (Porter, 1985).

Weerawardena & O’Cass (2004) reported that SCA is very closely linked with innovation capabilities of an organisation. The innovation capabilities can be classified as both technical and non-technical capabilities in order to gain competitive advantage. This brings awareness that SCA requires organisations leaders and implementers to be able to think innovatively of sharpening their core capabilities to become SCA. The outcome of the study supports the notion that SCA can be developed using decision-making based on superior entrepreneurial skills, nurturing market-focused learning capabilities and innovation.

For an organisations unique proposition to make an effective contribution to the organisational performance and create SCA, Johannessen & Olsen (2003) suggests that the unique proposition first needs to be moulded to become a competency and later a distinctive competency such that it is something their competitors do not possess. Apart from owning assets, organisations’ knowledge can also be transformed into a distinctive competency to contribute to SCA (Johannessen & Olsen, 2003). In order for knowledge assets to be effectively applied in the context of building distinctive competency, they proposed the application of effective training on employees. Their study is based on

efficiency-based approach rooted in Penrose's (1959) theory. The researchers argue that training is important as it ensures the future state of a current distinctive competence, since this is fundamental to SCA – such that even future competition cannot duplicate one's competency. However, their findings uncover that although the impact of training is recognised by organisations, nevertheless the application of training is still very conventional and highlights the importance of dynamic contextual training and the need to incorporate elements of knowledge-based theory on knowledge integration.

According to Peppard & Ward (2004), another aspect that is closely linked with creating and sustaining competitive advantage is the application of technology which includes IT capability and IT investments. The researchers explain that IT capability and investments can only deliver results when aligned with strategy. They found that among the common causes for ineffective IT investment were due to misalignment with strategy. It is noted that organisations may gain “first mover advantage” through IT investment and IT capability. However, if the competency can be quickly duplicated by rivals then it is not an SCA. Hence, the researchers advocate the IT capability and investments alone are unlikely to create SCA, however can create business value when linked with products, services, processes and business models.

A relatively recent study by Wu (2010) examined SCA based on resource-based view and dynamic capability theory in order to determine the relationship between dynamic capabilities and competitive advantages along with the moderating effect of environmental volatility. Based on Taiwanese organisations, the study revealed that dynamic capabilities influences competitive advantage and that higher environmental volatility reduces competitive advantage of organisations (L.-Y. Wu, 2010).

2.3.4 The Influence of Organisational Factors on BPM

Structural Alignment and BPM

Stemming from TQM, it was noted that in order for BPM to function in an optimum fashion, it has to be governed by an appropriate structure (Goldkuhl & Lind, 2008; Lee & Dale, 1998; Zairi, 1997). For a process-focused culture to operate effectively there needs to be alignment between structure and BPM. Zairi (1997) points out correctly that structure on its own is not capable of executing the desired change in the organisation. However, structure is an enabler for BPM to be effective. This notion was supported by other researchers and go on to explain that the right structure along with BPM efforts can drive further impact to organisational effectiveness and excellence (Sever, 2007).

However, Richardson (2007) raises concern that in many instances, the organisational structures do not support effective BPM as the organisations are still operated based on the traditional function-based structure. Hence, BPM cannot affect the highest level of impact because the structure of the organisation does not allow this to happen. In order for organisations to allow a process-driven approach is to move away from a function-driven approach or structure.

This notion is also observed by Vergidis et al. (2008) in their research on effectiveness of BPM in the services industry. The researchers highlight that BPM can bring about tremendous benefits to organisations and practitioners are aware of this yet practitioners do not seem to be providing the required support for BPM to be fully

implemented in their organisations. Their findings reveal that although business processes are well documented and managed yet the departmental structures remain the same and processes are treated as an external separate entity to the organisation structure. This creates a disjoint since the operational structure is not conducive in allowing operational activities to be executed effectively.

Goldkuhl & Lind (2008) questioned the relationship between BPM and structure which is of antagonistic rivals. This question aptly describes the contrast between BPM and organisational structure. The traditional view of organisational structure is vertical while BPM propagates a horizontal cross-sectional view. The researchers explain the rationale for BPM to move away from the traditional organisational structure is because it ignores the element of customers in executing the activities. The perspective of BPM viewed by the researchers was speech act theory since BPM is regarded as a communication and coordination tool to deliver results. Their study concludes that BPM can be integrated with organisation structure based on two perspectives – the transformative view and the coordinative view.

In order to perform effectively in competing markets, organisations must be able to align their structure with the external environment. This would then create a conducive platform for operational activities to deliver customer value and business value (Trkman, 2010). Although there are standard structures in place for organisations to choose from, nevertheless, the structure applied to an organisation must be aligned with BPM and the organisational culture in order to create the right synergy which then can create the right competitive advantage. As such, it is believed structural alignment through BPM can create competitive advantage that would be difficult for rivals to duplicate.

Strategic Alignment and BPM

In order for creating and sustaining a working culture that is process-focused, it is imperative that BPM needs to be aligned with the organisations' strategy and goals (Goldkuhl & Lind, 2008; Lee & Dale, 1998; Zairi, 1997). This has been advocated by the academic circle and concurred by the practitioner circle. BPM is at the heart of operational activities. It is important that operational activities are linked with strategic activities. Only then can the strategy be cascaded down to the operational level. This effort is also strongly emphasized in TQM and stressed by Deming in his 14 points.

Neubauer (2009) explains that in order to sustain the implementation of BPM, there needs to be alignment between strategy and BPM. He is also quick to point out that this task is seemingly easier said than done since it requires time, effort and capable leadership. His study revealed that close to 60% of respondents do not align their strategies with BPM.

Richardson (2007) points out that in order for strategic changes to take effect, there has to be changes to BPM. However, he also concurs with Neubauer (2009) and explains that in majority of cases, strategy is managed by top management while BPM is managed by the middle management and what is further alarming is that the assumption top management makes that the strategies are later aligned to BPM by the middle management. Sadly, in most cases, this does not happen, causing misalignment between strategy and BPM.

Ideally, the executive management level need to spend time to understand the business processes and ensure that appropriate support is rendered to employees to change their processes to support the new strategic direction (Jeston, 2008). This may help set the alignment between strategy and BPM in the right direction to deliver business results.

Strategy is closely related to SCA. Strategies need to be formulated and executed such that it creates competitive advantage for organisations. Strategies are to be formulated taking into consideration the internal and external environment in which the organisation operates. However, as pointed out by Jeston (2008), strategy on its own without proper execution cannot deliver the desired outcome. Good strategy coupled with good execution is required to steer an organisation to enjoy greater market share. While leadership is looked upon for setting winning strategies, it is the same leadership that is also looked upon for enabling the strategies to be cascaded down to the operational level whereby the execution takes place.

In addition to leadership, the importance of innovative strategy can also be a source for superior SCA (Weerawardena & O'Cass, 2004). The researchers explain that strategy can be regarded as a source of superior SCA, similar to people, process and systems. However, the ability to craft a winning strategy that is difficult for competitors to duplicate requires innovation along the entire value chain.

In a study carried out by Leskovar-Spacapan & Bastic (2007), strategic orientation of organisations is mediated through innovation capability in order to achieve SCA. Their study revealed that innovative strategies tend to produce slightly better outcomes as opposed to cost or quality driven strategies. It was observed that

Slovenian organisations tend to exhibit lower levels of innovation capabilities. The study also reveals the importance of proper strategic development in order to create SCA. The researchers suggest that lack of winning strategy and innovation to create SCA among Slovenian companies could be because of the nature of the transition economic condition of the country. This is because, out of the sample of organisations participated in the study, only companies who were in competition with the Western organisations tended to exhibit higher levels of strategic planning and innovation capabilities.

It is also empirically demonstrated that IT capability and IT investment when in alignment with organisational strategies tend to delivery greater organisational performance and induce the development of capabilities for competitive advantage (Kearns & Lederer, 2000, 2003). Based on the findings from both the studies, it was observed that when IT executives involved and integrated business planning and IT planning, that synergy when linked back to the organisations strategy delivered greater competitive advantage.

IT Capability and BPM

It is believed that the full potential of BPM can be realised through IT capability (Vergidis et al., 2008). IT capability can be used to automate business processes and create workflow systems that enable organisations to function more efficiently. There are numerous articles available supporting the positive impact of IT capability on BPM. However, Vergidis et al., (2008) cautions that when the right structure is not in place for BPM, then IT capability may not be able to deliver maximum results on BPM.

IT capability also largely depends on IT investments. Though numerous studies have explored the relationship between IT capability and IT investment, however, studies have yet to explore the relationship through BPM (Trkman, 2010). The researcher explains that the right amount of IT investment on BPM in areas needing for enhanced IT capability can result in greater efficiency of the organisation.

Similar study by Neubauer (2009) also highlights the potential of IT capability in delivering effective BPM. He recommends leadership with a mix of IT and business skills in order to sustain the implementation of BPM and ensure continual relevance. This view is also supported by Kearns & Lederer (2003). Their study on 161 survey responses by US companies revealed that top leadership active involvement in both business and IT planning creates greater value along the value chain however does not contribute to creating competitive advantage. The implications documented by the researchers suggest that well-crafted strategy may have been poorly executed.

In order for IT capability to be effectively matched with BPM, there needs to be IT alignment with business objectives (Peak, Guynes, Prybutok, & Xu, 2011). The researchers believe there are antecedents to IT capability and alignment in order to ensure the end results to meet business objectives are met. The antecedents are intellectual dimensions and social dimensions. In their context, intellectual dimension is when there is cohesion between IT and business while social dimension exist when there business and IT employees understand the business and IT goals and plans and ensure that synergy exist between the two. The researchers believe that in order to exhibit IT capability, IT alignment needs to be developed and for IT alignment there requires establishment of the intellectual and social dimensions.

Recent articles have indicated that since IT capabilities are easily replicable, hence IT capability is no longer able to help organisations to create distinctive competence (Masli, Richardson, Sanchez, & Smith, 2011). Their study indicated that returns on investing in IT capabilities on organisational performance declined after the dot-com crash in 2000 and prior to 2000, the advantages brought about by IT capabilities on performance were very short term.

Organisations recognise the importance of IT in elevating the operational activities and believe that IT capability can be transformed into competitive advantage through BPM and knowledge management (Kearns & Lederer, 2003). However, they also acknowledge that alignment between IT capability and strategy with BPM can be costly and time-consuming. It is also noted that the results are by no means short term.

Building SCA can stem from IT capability, however it needs to be embedded within other elements of the organisation (Peppard & Ward, 2004). The researchers put forth the notion that organisations need to understand the impact of IT on business outcomes and determine how to integrate IT capability into the organisations operations in order to create SCA. Central to their argument is that IT capability cannot be a source of competitive advantage or SCA since competitors can easily duplicate the capability. However, when applied to other potential competencies, IT capability can transform the competency to a distinctive competency.

A study on IT capability and BPM, specifically process improvement initiatives revealed that both these variables are positively correlated (Law & Ngai, 2007). While it is true that organisations today rely heavily on IT capability in day-to-day business operations, nevertheless from the perspective on creating business value could be a

different story. It is difficult to ensure IT capability within organisations is implemented effectively due to the rapidly changing internal and external environments (Ullah & Lai, 2011). This situation grows more complicated when the employees who develop or implement IT solutions do not understand the business goals and directions, as such there may be a potential gap in the fulfilment of IT capability with the business outcomes in order to create SCA. Ullah & Lai (2011) assert IT capability is very closely linked with strategy and structure of the organisation, indicating that without clear links with strategy and structure and in-depth understanding of business goals, it would be a challenge to transform an IT capability into an SCA.

Proper implementation of IT capability along BPM activities requires innovative thinking to break away from the familiar ways of carrying out activities to adopting unfamiliar “breakthrough” ways (I.-L. Wu, 2003). Wu believes that IT capability is not merely automation rather has strategic significance and capable of creating competitive advantage. His study unfortunately reveals that practitioners maintain IT capability within the IT department and treat IT capability as automation and upgrade activities as such the full potential of investments on IT capability cannot be realised. Only when top management reviews and analyses the full capacity of IT can IT deliver strategic related results to organisations.

Process Flexibility and BPM

Aggarwal (1995) believe that all process improvement initiatives such as TQM, BPR and BPM are efforts to increase process flexibility. Process flexibility within the context of BPM can be regarded as range, mobility and uniformity. In this respect,

process flexibility must be able to allow differing volume, cater for differing capacity requirements and at the same time maintain consistency in quality of output. Aggarwal (1995) believe that there are aspects of process flexibility that can be measured while there are many others that cannot be measured as it is intangible. Nevertheless, process flexibility is closely related to strategy, structure and systems. The case study of 10 organisations revealed that flexibility is needs to be ingrained within all resources involved in the value chain activity.

The notion of process flexibility can be examined within the perspective of scope of change and rate of speed in addressing the change (Parthasarthy & Sethi, 1992). Although organisational structure, strategy and systems are independent of process flexibility, it is the right mix of all these elements that enable BPM to function effectively in delivering business outcomes.

In an attempt to provide a different perspective of process flexibility within the context of IT, the perspective of reusability and customizability of automated BPM was investigated against organisation's perceived competitive performance (Nidumolu & Knotts, 1998). Again within this study as well, the view of process flexibility was based on range and response. The study conducted on U.S. manufacturing companies, indicates that process flexibility influences perceived competitive performance and in return process flexibility is influenced by customizability but not reusability.

In a study that examined process flexibility and BPR, the researchers noted that organisations that do well tend to anticipate and act proactively even before the change had impacted their organisation or industry (Yung & Chan, 2003). In this respect, process flexibility and BPR created value because due diligence on market and

environmental conditions were regularly carried out. Their case study analysis outlined that process flexibility on BPM will be effective when there are transformational changes at three levels of the organisation – mindset, systems and continuous improvement.

In a study on the effectiveness of BPR implementation, it was observed that one of the reasons for high failure rate of BPR is that the BPR solution does not take into consideration the future needs of the organisation (Fitzgerald & Siddiqui, 2002). In that respect, it is believed that the strategy, process, systems and structure need to cater for certain level of process flexibility. Finally, the researchers cautioned that process flexibility needs to be the platform where process related initiatives are carried out to ensure that any new or improved processes can accommodate exceptions and changes in time to come.

Process flexibility and BPM revolves around process goals and coordination in handling short-term and long-term flexibility (Soffer, 2004). There are several constraints that inhibit that achievement of process flexibility in BPM, such as environmental constraints, goal reachability constraints, BPM system constraints and sharing dependency constraints. Process flexibility on BPM can be effective only when these constraints are properly addressed. In addition to that it is advocated that short-term and long-term process flexibility allows for greater innovation capabilities and prudent cost management (Athey & Schmutzler, 1995).

BPM can be effective in organisational situations whereby there are allowances for deviations. McCormack (2001) believes that organisations have little choice for the matter of being flexible and fast in responding to internal and external conditions. When

the organisation has flexibility in the process designs, then ad-hoc changes can be applied without major impact in terms of time or cost.

Process flexibility has been examined within the supply chain paradigm on organisations performance based on Spanish automotive suppliers (Sanchez & Perez, 2005). The dimensions of supply chain flexibility were examined within the concept of range and response. The findings of the study indicate that supply chain flexibility influences organisational performance thus contributing to the body of knowledge that flexibility is a necessity in the manufacturing industry.

Process flexibility can also be viewed from the perspective of stability. Process flexibility revolves around maintaining balance between change and stability (Regev et al., 2007). These researchers also identified organisational structure as a key component in the relationship between process flexibility and BPM indicating that it is the structure that facilitates the level of change than an organisation can afford to accommodate. The researchers cautioned that although process flexibility and the rate of change to respond to market conditions were important, too frequent changes can actually cripple an organisations performance. Hence the contention that process flexibility needs to have a certain degree of stability and balance. It is believed that just the right amount of process flexibility, even in small quantities may be more than sufficient to create increased performance (Chou, Teo, & Zheng, 2008).

Although Stohr & Muehlen (2008) believe that flexibility is a multi-faceted concept, nevertheless, the researchers also perceive flexibility within the scope of processes. The researchers argue that organisations strategic objectives can only be realised through BPM which requires process flexibility as its foundation. The scope of

BPM spans across automated workflows and manual processes that are executed by both employees and managers. Process flexibility is believed to have the potential to create competitive advantage since organisations with high levels of process flexibility tend to be proactive rather than reactive. As such, these organisations would be drivers of change not only in their organisation but within the industry that they operate in as well. Process flexibility through BPM provides organisation with the right mix to create competencies along the key value chain activities.

Process flexibility in relation to BPM requires organisations to have the capability to develop new processes and change existing processes swiftly without incurring too much cost. At the same time, process flexibility also requires that exception handling with the existing process must not deviate outside the design and purpose of the process. In another words, process flexibility requires that organisations can change or allow exceptions within the operational activities without compromising the organisations business purpose and outcomes (Stohr & Muehlen, 2008).

2.3.5 The Influence of BPM on SCA

BPM is believed to influence SCA since the latter is concerned with creating competitive advantage in which BPM can be harnessed to provide such an advantage. BPM is the blueprint of how organisations' deliver results to their customers (Goldkuhl & Lind, 2008; Lee & Dale, 1998; Zairi, 1997). A combination of TQM and BPR, BPM has the potential to deliver consistent outputs while leveraging on structure, strategy and systems. The manner in which an organisation carry out and manage their processes are very significantly different with another organisation, regardless the fact that both

organisations could be competing in the same market and offering similar products or services.

It is well established that organisations should spend a portion of their time, cost and effort in leveraging their BPM in order to create SCA (Kearns & Lederer, 2003). In order to carry out this effort efficiently, organisations can look into mobilising their structure, strategy, IT investments and capability to create such a distinctive capability that would ultimately yield to become an SCA. SCA is forward-looking that encourages management to look beyond daily operations to long-term development and deployment of resources (Chaharbaghi & Lynch, 1999).

Hung (2006) stresses the importance of BPM and how it can potentially increase SCA. In his study, he combined structural alignment, strategic alignment and IT alignment as the central view of process alignment and empirically tested the relationship with organisational performance. In addition, he tested the mediating effects of this process alignment with people involvement. People involvement which consists of executive commitment and employee empowerment was tested. His study was based on top organisations in Australia. The findings revealed that process alignment influences organisational performance and mediates the relationship between people involvement and organisational performance. To extend his study, the view of process alignment is expanded to include business process orientation and process improvement initiatives. At the same time, structural alignment and strategic alignment are separated as individual variables. Process flexibility is introduced as an organisational element that provides the platform for processes to be managed effectively and efficiently. It is the degree of change and the speed in which the change can be administered that allows BPM to be beneficial to the organisation. Finally, the

technological element is viewed through IT capability and IT investment. The aspect of organisational performance is enhanced to view as SCA.

2.3.6 The Effects of IT Investment on BPM

The advancement in leaps and bounds brought by IT has tremendously changed the way organisations work, however organisations are currently in the dilemma of “productivity paradox” (Dasgupta, Sarkis, & Talluri, 1999). What the researchers are attempting to convey is that the benefits from IT investments on to organisations productivity and cost effectiveness are almost negligible. Their study was conducted on manufacturing and services industries covering 162 organisations and concurs with the “productivity paradox” theory that investments in IT have negligible effects of organisations performance, productivity and cost effectiveness.

The appropriate investments in IT has the potential to heighten the level of impact of BPM on organisational outcomes (Lee & Dale, 1998). Within the context of BPM, the value of systems or IT is in the ability to increase efficiency and effectiveness. IT investments to automate workflows can increase the delivery for customers. Previous studies have studied IT investment on organisational performance and SCA, however the relationship between IT investment and BPM is yet to be clearly understood. Investing in IT for mission-critical processes can create competitive advantage for organisations.

IT investments are believed to have a positive impact on organisational outcomes through alignment with BPM (Trkman, 2010). Though BPM directly is related with SCA, nevertheless with the right amount of IT investment, the outcomes may be more significant. In addition, IT investments need to be channelled to the appropriate areas requiring improvements in IT capability.

Similar to IT capability, IT investment according to Peppard & Ward (2004), when channelled to the right competency, can harness the competency to become a distinctive competency that competitors cannot imitate or substitute with alternative solutions. Again, it is iterated that IT capability and investment directly cannot be a source of SCA, however the IT expertise within the employees and how the IT knowledge is applied can be a source of SCA.

Kearns & Lederer (2004) in their study revealed that there were significant relationship between IT focus and the ability to apply IT to create SCA. The findings indicate that organisations with higher levels of IT investments tend to exhibit higher levels of business performance. The findings shed a different perspective on the ability of IT investments in improving organisational performance when most researches tend to refute the relationship. The researchers recommend active involvement of IT leaders in business planning activities in order to ensure alignment of IT with the business plan which can finally result in competitive advantage for the organisation.

Similar study was conducted but in the relation between IT investment, strategic alignment and organisational performance. In recent years, IT has become very common and easily available to most organisations (Celuch, Murphy, & Callaway, 2007). Their study aimed at uncovering the relationship between IT investments, IT

capability, strategic alignment and organisational performance on 160 small to medium-sized organisations in US. Based on their findings, it was brought to light that IT investment delivers higher organisational performance when correctly applied through strategic alignment on IT capability.

7-Eleven Japan Co. Ltd has been recorded as one of the most profitable and successful organisations whose success and competitive advantage is linked to the ability to cleverly channel their IT investments in the appropriate IT capability requirements of the business areas (Weill & Aral, 2006). No doubt, the IT investments are made in line with business strategy as well. The researchers explain that based on their study of 147 companies over a span of five years, the organisations enjoying substantial profits and SCA are those that are IT savvy. The researchers define categories of IT investments as transactional, informational, strategic and infrastructure. Hence the ability of 7-Eleven Japan to do well over the years is that the IT investments are channelled to the appropriate categories. The researchers advocate that IT savvy organisations are those that are able to make IT investments along their business strategies, hence create a distinctive capability that is difficult for competitors to duplicate or substitute with other solutions.

Based on the case studies, Weill & Aral (2006) outline the following seven steps to enjoy competitive advantage and business value from IT investments:

1. Identify and analyse current and previous year's IT portfolios. This analysis will help to match the IT investments against the business strategy to determine the effectiveness of each investment.
2. Understand performance of each category of IT investment and compare against industry standards.
3. Evaluate and monitor organisations level of IT savvy.
4. Balance the investments on IT portfolios and track risk-return for each investment.
5. Conduct annual reviews on IT portfolios and make changes as required.
6. Include the IT portfolio into the IT governance framework to ensure that IT is applied in the correct manner with proper controls and measures.
7. Document lessons learnt and conduct post-implementation reviews to ensure previous mistakes are not repeated in the future.

Within the context of developing countries, IT investments are primarily channelled into BPM in order to increase productivity by improving process level efficiency and effectiveness (Prasad & Heales, 2010). Based on socio-technology theory, the researchers explain that IT investments can bring immense changes in organisational structure, people and processes. The fundamental believe that IT investment in developing countries is skewed towards want rather than need in order to create business value. Their study examined IT investments on organisational performance within the context of developing country, specifically Fiji. The outcome of their analysis indicated that well-directed and well-planned IT investment does in fact create positive business value for organisations.

2.4 Summary of Literature Review and Analysis

The literature on BPM, BPO or PII that were discussed in this chapter is summarised in the table below.

Table 2.2: Summary of Literature Review and Analysis of BPM

Variables Under Analysis	Researchers (Year)	Scales of Measurement	Industry	Sample Size	Country	Results
BPO and Business Performance	(McCormack, 2001)	McCormack (2001)	Manufacturing	100	USA	Tool for measuring level of BPO in organisations was developed.
	(Skrinjar et al., 2008)	Extension of McCormack (2001)	Mixed	405	Slovenia & Croatia	BPO directly impact non-financial performance however only indirectly impact financial performance.
Approach of BPM	(Goldkuhl & Lind, 2008; Lee & Dale, 1998; Zairi, 1997)	Not Presented	Mixed	3	UK	Highlights the important aspects of structure, systems and correct approach of BPM.
Structure and factors of BPM	(Paim et al., 2008)	(Paim et al., 2008)	Mixed	61	Sao Paulo City, Brazil	BPM can be categorised as designing processes, managing processes from day to day and fostering process related learning.
BPM in manufacturers	(Golann, 2006)	Not presented	Manufacturing	6	USA	BPM has a positive impact on market orientation.

Variables Under Analysis	Researchers (Year)	Scales of Measurement	Industry	Sample Size	Country	Results
Project types of BPM and BPM maturity	(Bucher & Winter, 2009)	Not Presented	Mixed	-	Switzerland	Established relationship between BPM maturity and process management design type.
Organisational Alignment, People Involvement and Process Improvement Programmes	(Lok et al., 2005)	(Lok et al., 2005)	Mixed	260	Australia	BPR, strategic alignment and people involvement influence organisational performance.
Process Alignment and People Involvement against Organisational Performance	(Hung, 2006)	(Hung, 2006)	Mixed	333	Australia	Process alignment and people involvement influence organisational performance.
Process information for managing and improving processes	(Davenport & Beers, 1995)	(Davenport & Beers, 1995)	Mixed	20	USA	Proper interpretation of process information results in accurate identification of improvement programmes.
Benefits of BPM	(Kung & Hagen, 2007)	Not Applicable	Bank	1	Switzerland	The benefits are reduction of cycle time, increase in output per employee and increase in quality of work products.
Status of BPM	(Neubauer, 2009)	(Neubauer, 2009)	Mixed	185	Germany, Austria & Switzerland	Majority of companies have not achieved the acceptable level of being recognised as a process-focused organisation.

Variables Under Analysis	Researchers (Year)	Scales of Measurement	Industry	Sample Size	Country	Results
Critical success factors of BPM	(Trkman, 2010)	Not presented	Services (Bank)	1	Slovenia	Critical success factors are culture, process owners, process change initiatives and adoption of change management.
Case Study on BPM Implementation	(Ongaro, 2004)	Not Applicable	Public Sector	1	Brazil	Factors enabling BPM in public sector are legal & cultural setting, reforms, executive leadership, organisational culture, ICT and implementation of BPM. This resulted in significant reduction of turn around time.
	(Sentanin et al., 2008)	Not Applicable	Public Sector	1	Brazil	BPM must be linked with strategy in order to be effective. While the key challenges were cultural and behavioural.
Strategic BPM for Organisational Effectiveness	(Armistead et al., 1999)	Not Applicable	Mixed	4	USA & UK	BPM characteristics lend improvements to achieving performance.
Process Orientation and People Management	(Sever, 2007)	Not Applicable	Not Applicable	None	Not Applicable	Process orientation has the power to create a positive environment for improvement, communications, change and people.
Theoretical and Practical Perspectives of BPM	(Vergidis et al., 2008)	Not Presented	Services	25	UK	<ul style="list-style-type: none"> IT capability can be infused to BPM in order to create greater efficiency and effectiveness.

Variables Under Analysis	Researchers (Year)	Scales of Measurement	Industry	Sample Size	Country	Results
						<ul style="list-style-type: none"> • Most companies still operate on departmental structure.
Integrated view of BPM	(Goldkuhl & Lind, 2008)	Not Presented	Manufacturing	1	Sweden	BPM can be integrated with organisation structure based on two perspectives – the transformative view and the coordinative view.
Review and Evaluation of BPM	(Lee & Dale, 1998)	Not Applicable	Not Applicable	None	Not Applicable	<ul style="list-style-type: none"> • BPM consists of pervasiveness, ownership, documentation, measurement and inspection. • BPM requires communications, feedback and continuous process improvement. • Improvement tools are re-engineering, continuous improvement and benchmarking.
	(Adesola & Baines, 2005)	Not Applicable	Not Applicable	None	Not Applicable	In order to ensure resources are channelled for the right process improvements, there is a need to identify and understand the business needs through competitor analysis, internal and external environmental analysis, SWOT analysis and stakeholder analysis.
	(Filipowska et al., 2009)	(Filipowska et al., 2009)	Mixed	N/A	Europe	Presented an assessment procedure to evaluate the various BPM methodologies to determine the best fit within an organisation.

Variables Under Analysis	Researchers (Year)	Scales of Measurement	Industry	Sample Size	Country	Results
High Performance Management	(Jeston, 2008)	Not Applicable	Not Applicable	None	Not Applicable	Organisations' need to transform to become more process-centric through linkages with strategic outcomes.
Elements of BPM system	(Gong & Janssen, 2012; Huang et al., 2012; Lu et al., 2009; Shaw et al., 2007)	Not Applicable	Not Applicable	None	Not Applicable	Introduction of a BPMS architecture pyramid with 13 building blocks which serves to manage both human and machine-based processes.
BPM Systems	(Gong & Janssen, 2012; Huang et al., 2012; Lu et al., 2009; Shaw et al., 2007)	Not Applicable	Services	1	China	Business Process Management Systems (BPMS) in comparison with system flexibility, policy making, policy implementation, employee behaviour and operational performance.
	(Gong & Janssen, 2012; Huang et al., 2012; Lu et al., 2009; Shaw et al., 2007)	Not Applicable	Services	1	Netherlands	
	(Gong & Janssen, 2012; Huang et al.,	Not Applicable	Not Applicable	None	Not Applicable	

Variables Under Analysis	Researchers (Year)	Scales of Measurement	Industry	Sample Size	Country	Results
	2012; Lu et al., 2009; Shaw et al., 2007)					
	(Weber, Markovic, & Drumm, 2007)	Not Applicable	Not Applicable	None	Not Applicable	Presentation of a model with composition components and validation techniques built in the algorithm.
Enterprise Process View using Cognitive Mapping	(McCormack & Rauseo, 2005)	Not Presented	Manufacturing	1	US	Enhance the view of BPO into building high level business processes for organisations in order to achieve competitive advantage and was effective in creating a top down approach that links customer requirements to operational activities.
Supply Chain Management Process Maturity Model using BPO	(Lockamy & McCormack, 2004)	Not Presented	Mixed	90	US	Supply chain maturity was not significantly associated with organisational performance.
Business Process Improvements	(Lepmets et al., 2012)	(Lepmets et al., 2012)	Mixed	63	Europe	<ul style="list-style-type: none"> • BPM and PII need to be linked to strategic outcomes. • Large and complex systems may face difficulty for radical improvements. • Organisational structure may move towards process-based structure.

Variables Under Analysis	Researchers (Year)	Scales of Measurement	Industry	Sample Size	Country	Results
	(Siha & Saad, 2008)	Not Applicable	Not Applicable	None	Not Applicable	Outlined critical success factors to the outcome of process improvement initiatives.
	(S. Lee & Ahn, 2008)	Not Presented	Manufacturing	1	South Korea	Proposed an assessment model capitalising on the available IT resources within the organisation to drive organisational change.
	(Coskun et al., 2008)	Not Applicable	Not Applicable	None	Not Applicable	PIIs' are best carried out after process analysis narrow down on the critical weak points that need to be improved.
	(Anand et al., 2009)	(Anand et al., 2009)	Mixed	29	US	Proposed a conceptual framework that links purpose of improvements to people and process elements of the organisation.
IT Capability and Business Process Improvements	(Law & Ngai, 2007)	Not Presented	Mixed	3,377	Hong Kong & China	IT capability and process improvement initiatives are positively correlated.
BPM and Flexibility	(Aggarwal, 1995; Yung & Chan, 2003)	Not Applicable	Mixed	10	US	BPM and PII are simply mechanisms in enhancing the process flexibility.
	(Nidumolu & Knotts, 1998)	(Nidumolu & Knotts, 1998)	Manufacturing	100	US	Process flexibility influences perceived competitive performance and in return process flexibility is influenced by customizability but not reusability.

Variables Under Analysis	Researchers (Year)	Scales of Measurement	Industry	Sample Size	Country	Results
	(Soffer, 2004)	Not Applicable	Not Applicable	None	Not Applicable	Process flexibility can exist along the dimension of time and can be categorised as short-term flexibility or long-term flexibility
	(Regev et al., 2007)	Not Applicable	Not Applicable	None	Not Applicable	The ability to strike a balance between continuous change while maintaining stability without the risk of compromising on losing the organisations identity.
	(Soffer, 2004; Stohr & Muehlen, 2008)	Not Applicable	Not Applicable	None	Not Applicable	Process flexibility has two fundamental requirements - capability for process management and flexibility.

2.5 Chapter Summary

This chapter introduces the underpinning theories which are dynamic capabilities theory, contingency theory and task-technology fit theory. The variables stemming from the theories are explained. BPM, process flexibility and SCA are derived from dynamic capabilities theory. Structural alignment and strategic alignment are derived from contingency theory. Finally, IT capability and IT investment are derived from task-technology fit theory. The variables are categorised as independent variables, mediating variable, moderating variable and dependant variable. Finally, the relationships among the variables are explained and the gaps from the literature are discussed to provide justifications for the problem statement and research questions.

CHAPTER 3 RESEARCH MODEL AND METHODOLOGY

3.1 Introduction

The importance of clearly understanding the problem statement and research questions is necessary to ensure that the research questions raised do in fact address the problem statement (Bickman & Rog, 1998). Subsequently, the suitable research model can be developed for empirical testing. This would then facilitate the selection of appropriate analytical tools for research.

Chapter 1 outlined the problem statement and research questions. Chapter 2 provided synthesis of literature to support the problem statement. This chapter on research model and methodology aims at presenting the research framework and hypotheses developed in addressing the problem statement and research questions.

Next, the research methodology used to empirically test the research model is outlined. This is followed by sub-sections explaining the qualitative and quantitative approaches used, sampling technique selected, scales development and measurement of constructs. Last but not least, the statistical analysis tool selected for testing the research model is discussed.

3.2 Research Stance and Approach

The study of various epistemologies namely positivism, conventionalism, postmodernism, critical theory and pragmatic-critical realism provides an array of theory of knowledge. However, it is recognised that there can be no single comprehensive epistemological standards covering all disciplines due to the problem of circularity. The problem of circularity occurs because any theory of knowledge presupposes knowledge of the conditions in which the knowledge takes place. The different epistemological positions have its own unique approach in executing research and the practice of reflexive thinking on the part of the researcher is the key differentiator in sustaining and maintaining the epistemological assumptions (Wren, 1994).

The word epistemology is derived from two Greek words – ‘episteme’ and ‘logos’. The two words put together means knowledge about knowledge. Epistemology is the study which involves challenging and reflecting on presupposed conventions and deeply rooted beliefs for the greater purpose of seeking true knowledge. Epistemological stances provide answers to questions regarding origins of scientific knowledge, the elements of scientific practice and the processes for the advancements of scientific knowledge (Sale, Lohfeld, & Brazil, 2002).

Epistemology consists of two views, objectivist and subjectivist. An objectivist view of epistemology presupposes that knowledge of the external world can be accessed objectively and advocates the possibility of theory neutral observational language. Whereas, a subjectivist view of epistemology denies the possibility of theory neutral

observational language and advocates the importance of language games in making knowledge claims (Wren, 1994).

The concept of ontology is a specification of a conceptualisation and is regarded in philosophy as the subject of existence with the aim of describing concepts and relationships that is in existence for an agent or a community of agents. Like epistemology, ontology also consists of two views, objectivist and subjectivist. An objectivist view of ontology assumes that social and natural reality has an independent existence prior to human cognition. Whereas, a subjectivist view of ontology assumes that reality is an output of human cognitive process (Wren, 1994).

Objectivist ontology with objectivist epistemology involves positivism and neopositivism. Both these orientations share the same empiricist commitment that sensory experience of reality is the basis for social scientific knowledge. Shared assumptions include availability of theory neutral observational language within the Cartesian dualism with the ability of the researcher to deductively test and inductively generate theory and correspondence of truth by the researcher's passive observation of the reality (Wren, 1994). The difference between positivism and neopositivism is that neopositivism advocates that in order to understand human behaviour, researchers must also gain access to the actors subjective interpretations of reality by means of deploying reputed qualitative methods of data collection. While in positivism, the researchers passive observation is construed as a subject-object dualism, while in the case of neopositivism it is construed as a subject-subject dualism. Nevertheless, both positivism and neopositivism deploy methodological reflexivity whereby researchers critically evaluate the techniques applied within their research domain (Sale et al., 2002; Wren, 1994).

This research adopts a neo-positivist stance, as such aims at combining both quantitative and qualitative methods. This approach to conducting research is referred as mixed-method approach. The study is based on quantitative methods but deploy qualitative methods to enrich the discussion and knowledge of the research (Sale et al., 2002).

3.3 Research Methodology

In a nutshell, the methodology adopted for the research comprises both qualitative and quantitative research methods. Qualitative research method is applied to complement the quantitative research method. Before commencing quantitative research, the measurement instrument for process flexibility needs to be developed. This is done using focus group discussion (FGD). Once the measurement instrument for process flexibility was developed, quantitative research method using survey instrument was administered to the targeted population. After commencement of data collection and analysis, qualitative research method using interview session was conducted to enrich the discussion on the findings from the study.

Since the study is grounded on neo-positivist approach, the elements of interpretative techniques are incorporated to substantiate the discussion and conclusion of the study in building the epistemology of BPM.

3.4 Research Model

Based on the review of past literatures in Chapter 2, the research model for this study revolves around dynamic capability theory, task-technology fit theory and contingency theory. The main concern of this study is to examine BPM and its relationship with SCA. Within the context of this study, the dimensions of BPM are measured by BPO and PII. In addition, structural alignment, strategic alignment, IT capability, process flexibility and IT investment variables are also examined.

The notion of this study following Semler (1997), Bharadwaj (2000), Jeston & Nelis (2006), Neubaer (2009) and Trkman (2010), is that structural alignment, strategic alignment, IT capability and process flexibility are elements of organisational factors that possibly enable BPM in delivering competencies to achieve SCA. As such, these variables function as the independent variables while BPM functions as the mediating variable. Next, as noted by Trkman (2010) and Walsh et al. (2010), it is believed that BPM influences SCA and IT investment have the potential to increase the level of influence. As such, IT investment functions as the moderating variable between BPM and SCA. BPM here plays the role of an independent variable. In all instances, the dependent variable in the study is SCA.

When contrasting with the theories under study, BPM, process flexibility and SCA are grouped under dynamic capability theory. On the other hand, structural alignment and strategic alignment are categorised under contingency theory. Finally, IT capability and IT investment are grouped under task-technology fit theory. The

categories of independent variables, dependent variable, mediating variable and moderating variable based on the underpinning theories are depicted in Figure 3.1:

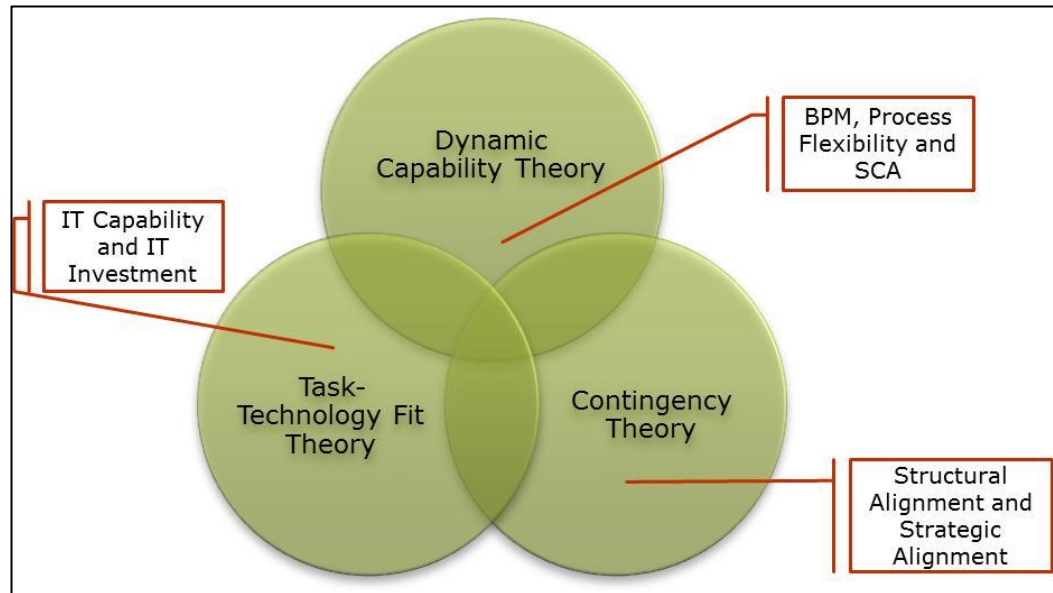


Figure 3.1: Variables Mapped Against Underpinning Theories

In addition to examining the variables within the context of the underpinning theories, the relationships between the variables need to be displayed. The relationships proposed are based on analysis of the literature reviewed in Chapter 2. The interactions among the variables are articulated and can be viewed through the research model. The research model would also serve as the point of reference in developing the hypotheses for the study. These hypotheses would then be empirically tested using the statistical analysis tools as explained in the subsequent sections. The variables are mapped into the research model as depicted in Figure 3.2:

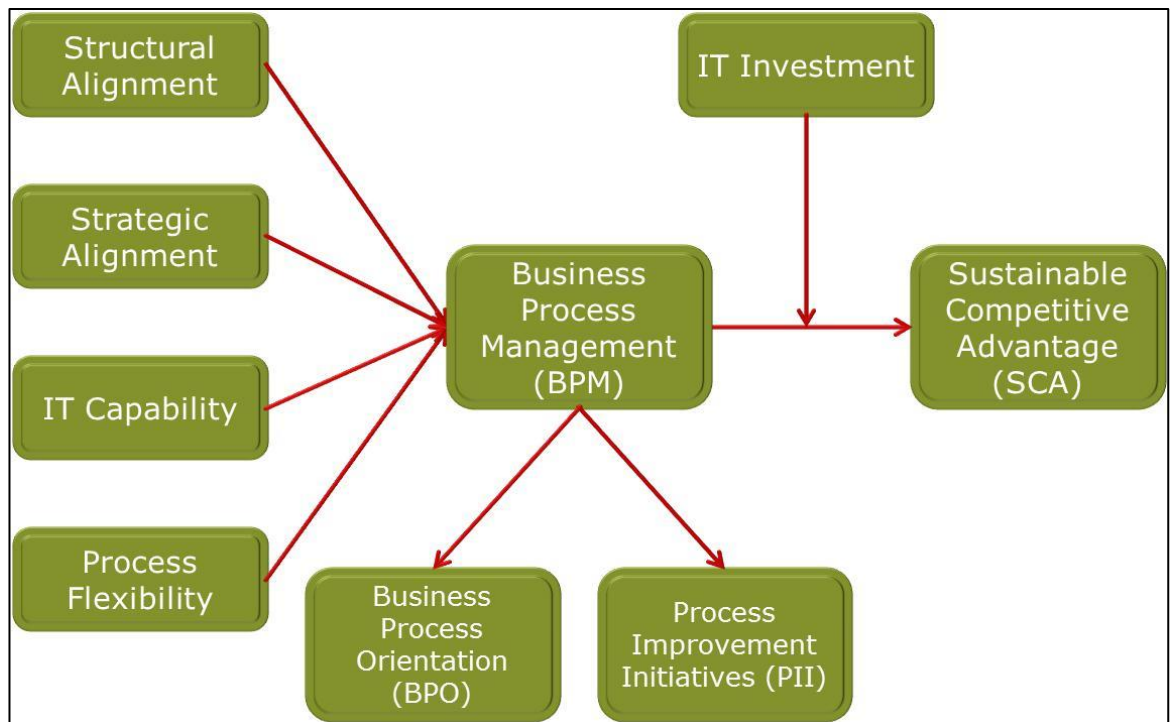


Figure 3.2: Research Model

3.5 Hypotheses Development

The variables and the relationships among the variables have yet to be empirically tested based on the combination of dynamic capability theory, task-technology fit theory and contingency theory. The research model can be empirically tested based on seven hypotheses. Figure 3.3 maps the research model with the seven hypotheses put forward in this research. The subsequent sections explain the seven hypotheses.

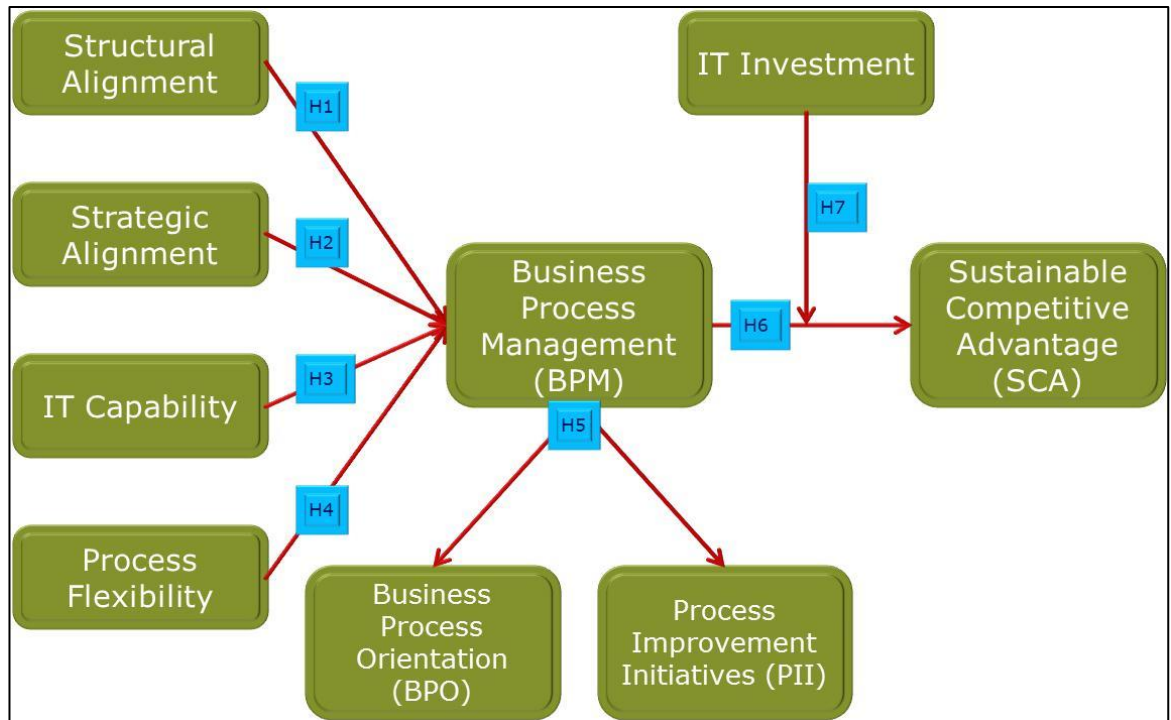


Figure 3.3: Research Model Mapped with Hypotheses

3.5.1 Relationship between Structural Alignment and BPM

Structural alignment focuses on the structure in which the organisation executes their processes in meeting customer demands while BPM promotes cross-functional teams. BPM is believed to be effective when the structure is aligned to support BPM activities. The management and improvements on processes can be carried out in greater efficiency and effectiveness is supported by properly aligned structure. Semler (1997) proposes future researchers to examine the relationship between structural alignment and organisation's competitive advantage position. Within the context of this study, it is believed that structural alignment influences BPM in creating SCA. Therefore, the first hypothesis is:

H1: Structural Alignment has positive impact on BPM.

3.5.2 Relationship between Strategic Alignment and BPM

Strategic alignment revolves around planning, mobilising resources and executing strategies in order to meet the organisational goals. In order for BPM to deliver results that matter to the organisation, alignment with the organisations' strategy is crucial. Strategies are crafted at the top management level while translation and execution of the strategies are carried out at the operational level where BPM resides. As such, rightfully, strategic alignment influences the landscape of BPM in an organisation. Neubauer (2009) and Trkman (2010) suggest examining the influence of strategic alignment on BPM. Within the context of this study, it is believed that strategic alignment influences BPM in creating SCA. Therefore, the second hypothesis is:

H2: Strategic Alignment has positive impact on BPM.

3.5.3 Relationship between IT Capability and BPM

BPM and IT capability are closely related with one and another. The IT capability in an organisation provides the platform for work processes and operational activities to be carried out efficiently and effectively. It is noted that IT capability on its own may not be a source of competitive advantage. IT capability on BPM however, may have the potential to create competency that can become an SCA. Aral and Weill (2007) suggests exploring the manner in which IT capability can be leveraged to create SCA. Within the context of this study, it is proposed that IT capability through BPM can create SCA. Therefore the third hypothesis is:

H3: IT Capability has positive impact on BPM.

3.5.4 Relationship between Process Flexibility and BPM

Process flexibility allows organisations to adapt processes to meet the changes in the volatile market without incurring too much cost, exhausting too much resources or taking too much time. Process flexibility is closely linked with BPR and is extended in this study to determine the relationship with BPM. The level of process flexibility influences the capability of BPM in organisations. Trkman (2010) suggests determining the influence of process flexibility on BPM. Within the context of this study, it is proposed that process flexibility enables BPM in creating SCA. Therefore, the fourth hypothesis is:

H4: Process Flexibility has positive impact on BPM.

3.5.5 Relationship between Organisational Factors, BPM and SCA

As outlined in sections 3.4.1 to 3.4.4, it is believed that organisational factors namely structural alignment, strategic alignment, IT capability and process flexibility are factors that on their own would not be able to yield any influence over SCA. However, these organisational factors could influence SCA through BPM. While hypotheses 1 to 4 are derived to test the relationship between the organisational factors and BPM, a fifth hypothesis is derived to test the mediating effect of BPM between the organisational factors and SCA. Hence, the fifth hypothesis is:

H5: BPM act as the mediation on the relationship between the four organisational factors (structural alignment, strategic alignment, IT capability and process flexibility) and SCA.

3.5.6 Relationship between BPM and SCA

SCA can be achieved by organisations that focus on building distinctive competencies that cannot be easily duplicated by competitors. At the same time, these distinctive competencies should be able to accelerate the performance of the organisation to stay ahead of the competition. BPM which comprises of process management, measurement and continuous improvement initiatives has the potential to be harnessed to become a distinctive competency. This is because BPM is the blueprint of an organisation that is unique to the organisation. As such, BPM is capable of exerting influence on SCA and the investigation of this relationship is suggested by Trkman (2010). Within the context of this study, it is proposed that BPM influences SCA. As a result, the sixth hypothesis is:

H6: BPM has positive impact on SCA.

3.5.7 Relationship between IT Investment, BPM and SCA

Similar with the other organisational factors, IT investment too on its own is not capable of influencing SCA. At the same time, BPM with the appropriate IT investment can potential accelerate the level of efficiency in creating distinctive competency which in return can create greater SCA. Trkman (2010) and Neubauer (2009) recommends to

examine the manner in which IT investment can be applied to leverage on by BPM to achieve SCA. Therefore, this study investigates the moderating effects of IT investment on BPM and SCA. As such, seventh and final hypothesis is:

H7: IT investment acts as the moderator on the relationship between BPM and SCA.

3.6 Research Design

The main purpose of this study is to examine the influence of BPM over SCA. In addition, this study also investigates the mechanism in which certain organisational factors are mediated through BPM to influence SCA. Finally the moderating effect of IT investment on BPM and SCA is also examined. Empirically testing the research framework requires careful design and selection of appropriate research methods. This is to ensure that the research rigour is not compromised. Referencing the specific questions this study aims to answer the appropriate methods and tools for conducting the study are outlined.

This research combines the usage of qualitative and quantitative research methods. Qualitative research method is used in two stages. The first stage of qualitative method is used for developing the measurement instrument for process flexibility. Although there are measurement instruments available for process flexibility, however they are inadequate for this study. The available measurement instruments for process flexibility are specific for manufacturing industry, while the scope of this study encompasses both manufacturing and services industry. As such, the instrument to

measure process flexibility needs to be developed. This task is carried out using qualitative research method called Focus Group Discussion (FGD). The outcome of the FGD is the measurement instrument for process flexibility.

Once the first stage of qualitative research method to develop the measurement instrument for process flexibility is concluded, the study will progress to applying quantitative research methods to empirically test the research framework. Cross-functional study using survey instrument is deployed to conduct the empirical testing. The design of this study is exploratory in nature. The survey instrument will include measurement instruments for all variables including the newly developed measurement instrument for process flexibility. The overall survey instrument will undergo content validity, pre-test and pilot test in an effort to purify and refine the survey instrument. Once the survey instrument is finalised, data collection activities will commence. Data will be collected from the distribution of the survey instrument to organisations in Malaysia. The data collected will be coded and analysed using statistical analytical tools.

The output from the quantitative analysis would be the findings of this study. The findings will indicate if the hypotheses were supported or not supported. At this juncture, the second stage of qualitative research method will take place. A series of interviews will be conducted on practitioners who responded to the survey. The interview sessions aids to follow up and understand further on the findings. The outcome of the interview sessions would be able to probe and explain the analysis of the survey. The findings from the quantitative and qualitative data analysis form the overall findings of this study. The overall findings assist in answering the problem statement

and research questions. Finally, the study is drawn to a closure with conclusion. The entire research process is depicted in Figure 3.4:

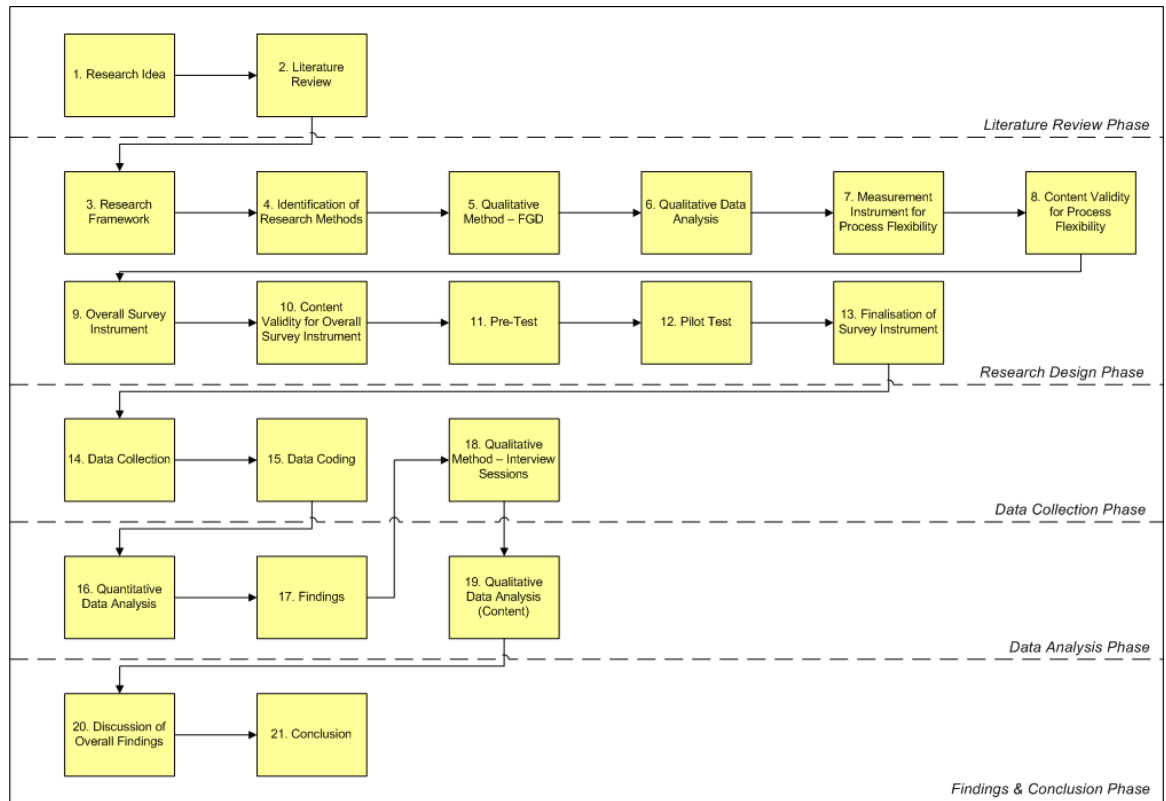


Figure 3.4: Research Process

3.7 Developing Measurement Instrument for Process Flexibility

Qualitative research method using FGD is recommended for this study in order to develop the measurement instrument for process flexibility. According to Churchill (1979), there are eight main steps involved in developing measurement instrument. The process starts with specifying the boundaries of the construct by outlining clearly what is in scope and what is out of scope. This step is also necessary to define the construct. This can be done through extensive literature review. The next stage would then be to craft the items that capture the essence of the construct. There are a multitude of

techniques for carrying this out such as exploratory research, critical incidents and FGD. The approach of FGD will be discussed in detail in the subsequent sub-section.

The next stage requires data to be collected for pre-testing in order to purify the measurement items. This stage is iterative and can revert back to refining the measurement items should the results of the reliability and content validity be poor. Once the reliability and consistency reaches an acceptable level, the next stage would be to proceed with the actual field work of collecting data and analysing the data. Once again reliability and factor analysis are carried out to ensure that the measurement items are reliable and consistent. If the results are poor, the entire process may require to be revisited. However, if the results are good, then the final step would be to develop the norms for the measurement instrument. The process flow as depicted in Figure 3.5 recommends the steps required in developing measurement instruments:

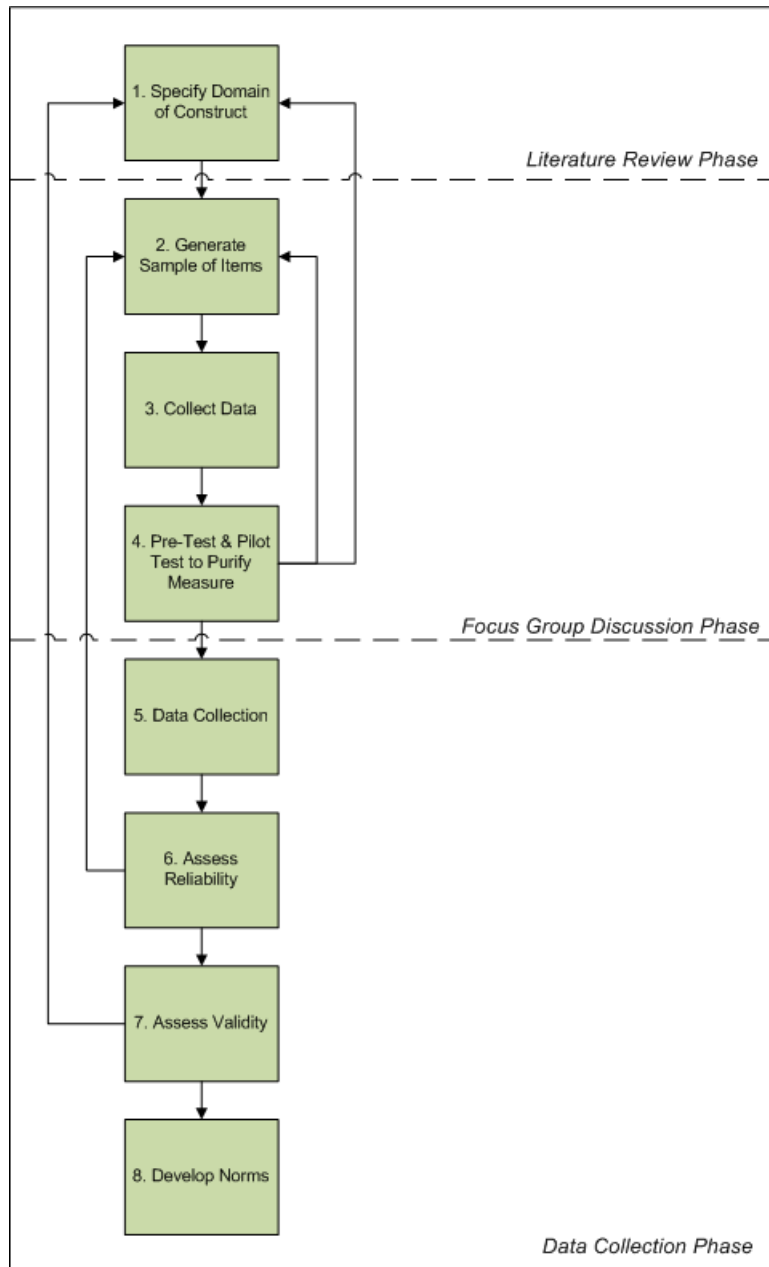


Figure 3.5: Process Flow for Developing Measurement Instrument

(Adapted from Churchill, 1979)

3.7.3 Focus Group Discussion (FGD)

FGD belong in the category of group interview as more than two people are interviewed at the same time (Myers & Newman, 2007). FGD provides an avenue for a group of homogenous individuals to have an intellectual discourse on a particular topic (Huston & Hobson, 2008). The origin of focus group is in the 1920s and used mainly in the psychology field. However, in recent times, this method has been accepted in the fields of education, management and public health (Wall, 2001). The benefits of FGD is that the quality of contents under investigation takes precedence over the number of respondents in the study (Massey, 2011). This facilitates greater knowledge sharing as opposed to individual interview sessions. Many ideas and information surface as a result of the group discussion. The platform not only benefits the researcher but also the participants in the discussion (Rose-Anderssen, Baldwin, & Ridgway, 2010). In addition, this exploratory study allows quick capture of information in an inexpensive manner. On the weakness aspect, like most qualitative methods, the outcome from the FGD cannot be generalised and subject to bias. Nevertheless, the results can be applied to quantitative research for generalizability (Huston & Hobson, 2008).

FGD can be broken down into three main phases – planning, execution and data analysis (Syed A. Kadir & Nadarajah, 2012). The planning phase requires engaging 6 to 12 experts in the area of Quality and Process Management and seeking their views on process flexibility. These experts were invited to attend a discussion. Their views would be used to develop the constructs and items to measure process flexibility. Prior to conducting the discussion, extensive literature review on process flexibility was carried out. This was to design the questions and set the boundaries for process flexibility. On the administrative part, suitable industry experts was identified and contacted to

participate as panel members. The selection process took into consideration various industries to ensure appropriate representation of manufacturing and services industry. A total of 11 industry experts were identified and contacted, however, finally only 6 experts agreed to participate in the FGD. The panel members came from financial, information technology, automobile, fast-moving consumer goods and consulting industries. The group was equally balanced in terms of gender, all of them with minimum 15 years of work experience in their respective areas.

The following are the 6 panel members for the FGD:

- Ms. Shuty Wong Shwu Tih, CSC Sdn Bhd.
- En. Krishna Kumar Jeganathan, Independent Consultant.
- Ms. Lee Suan Li, Nestle Group.
- Mr. Ahmad Nasrul Hakim Mohd Zaini, HeiTech Padu Berhad.
- Ms. Azlinda Mohd Ali, Optima Solutions Sdn Bhd.
- Mr. Zulkifli Senu, Proton Holdings Berhad.

The next phase in FGD is the execution phase. The FGD was carried out on Friday, 25th March 2011 in Hotel Singgahsana, Petaling Jaya from 3:00pm to 5:00pm. The researcher played the role of moderator to steer the discussion in the right direction and ensure all the questions are covered within the specified period of time. The following questions were raised to the panel members:

- What are the key elements associated with process flexibility? How is process flexibility practiced in your organization & daily operations?
- Is process flexibility equivalent to innovation?
- Looking back, what is the end product? Is it a product or is it a serviced product?
- How would you like to see process flexibility in your organization in the near future?

The last phase of FGD is the data analysis phase. The entire discourse was recorded to be transcribed with the verbal consent from the panel members. With the conclusion of the FGD, verbatim of the discourse was transcribed and circulated to the panel members for the review and feedback (refer to Appendix 1). Once all feedback was received, the verbatim was analysed to identify common threads through data reduction as stipulated by Huston & Hobson (2008). All irrelevant information was removed and the data was reduced to chunks of information and categorised until common threads surfaced which formed key themes of process flexibility (refer to Appendix 2). From the key themes, the instrument to measure process flexibility was derived. Finally, 3 out of the 6 panel members were interviewed to review the themes and instrument for the purpose of content validity. The instrument was refined based on their feedback. Table 3.1 documents the output from the data analysis.

Table 3.1: Measurement Instrument for Process Flexibility

Theme	Questions
Controllability while meeting shared objectives	<ul style="list-style-type: none"> • Processes are created or modified while still complying with key controls (meeting stakeholder requirements). • Processes are created or modified without any risk of deviating from the common goals.
Adaptability/ Responding to Change	<ul style="list-style-type: none"> • Processes are designed to detect and respond to changes in the business environment with little penalty in time, effort, cost or performance.
Continuous Improvement	<ul style="list-style-type: none"> • There are mechanisms in place to allow easy modifications to processes for improvements, based on lessons learnt from past or end of current efforts.
Creative & Innovative	<ul style="list-style-type: none"> • New processes are developed or existing processes are simplified rapidly and inexpensively to meet market needs.
Exception Handling	<ul style="list-style-type: none"> • Processes are designed to allow temporary deviation from the current norm/ standard.

The main findings from the focus group session are that key elements of process flexibility, regardless of industry are ability to adapt to changes, creative in adaptation, allow for exemptions and continuous improvements, while remaining within the shared objectives and controls of the organisation. This finding was in line with definition and explanation put forth by Regev et al. (2007) and Sanchez et al. (2005). Although Soffer (2004) explains that process flexibility can be associated with exception handling, findings from the session revealed that it was important to ensure that the exceptions while deviated from the current process norm should not be allowed to deviate from the key controls and objectives of the organisation. The reason was that this would increase the risk exposure of the organisation.

The panel members collectively agreed that process flexibility was necessary to meet and address customer needs. This extends further the argument put forth by Nidumolu et al. (2008) and Parthasarthy et al. (1992) whereby indicating process flexibility as the key driver in responding to market and technological changes. Findings from the discussion revealed that the ultimate aim to allow flexibility was to win new customers or retain the existing customers. This indicated that the end result is always about the customer.

Another interesting finding was that as far as practitioners were concerned, process flexibility allows important lessons learnt to be captured and triggered continuous improvements to the existing processes. The importance of adapting and managing change for the need to survive, operate profitably and satisfy customers were common among the organisations the panel members came from. This supports the arguments discussed by Aggarwal (1995), Yung et al. (2003) and Soffer (2004).

Availability of critical information in real-time surfaced as an important criterion in enabling quick response and aiding in decision-making. Thus implying that even if an organisation has very flexible processes, if information is not available in a timely manner, it may not trigger the response to change which occurred in the external environment. This finding is worthy of further research and analysis.

Once the measurement instrument for process flexibility was developed, the study was ready to move into the next phase which is the quantitative research phase.

3.8 Quantitative Research

The literature on BPM indicates the application of a wide variety of research techniques, ranging from qualitative to quantitative methods. Popular qualitative methods applied are case studies which have been beneficial in determining the key variables. Nevertheless, for this study, quantitative research techniques are preferred to enable the research framework to be empirically tested and generalised to the population at large.

Close-ended survey instrument is used as this allows the questions to be administered to a large number of organisations. The questions in the survey included constructs for BPM, SCA, structural alignment, strategic alignment, IT capability, process flexibility and IT investment. The constructs were measured using a 5-point scale with anchorage from strongly disagree (1) to strongly agree (5). The items for process flexibility were developed from the FGD while the items to measure the remaining variables were adopted and adapted from previously tested instruments.

The overall survey instrument was pre-tested to ensure that the questions in the survey instrument were clear. This exercise is to achieve content validity of the overall survey instrument. The overall survey instrument was finalised based on the feedback from the pre-test. Subsequently, the data collection phase commenced. The survey was administered to the organisations listed in the Malaysia 1000 Directory which consists of 1000 Malaysian organisations. The list of organisations spanned across all states in Malaysia, including Peninsular Malaysia and the eastern states.

The data collected is analysed using the Statistical Package for Social Sciences (SPSS) and Analysis of Moment Structure (AMOS). SPSS is used to churn the descriptive statistics of the data collected, testing of assumptions for normality, reliability analysis and Exploratory Factor Analysis (EFA). On the other hand, AMOS is used for Structural Equation Modelling (SEM) based on Confirmatory Factor Analysis (CFA) to test the measurement model and the structural model.

3.8.1 Survey Instrument

The survey instrument is used for data collection for quantitative research method. The survey is self-administered to the target organisations. Self-administered survey implies that the respondents reads, understands and responds to the questions on their own without the need of a trained interviewer. One of the main advantages of self-administered survey is that it can be spread across a wide geographical area at minimal cost. In addition, the respondents would have the luxury of filling out their responses at their most convenient time. However, it is also noted that one of the weakness of self-administered survey is that the respondents can choose not to participate in the survey or choose to leave the survey incomplete. In order to mitigate this potential drawback, a larger sample size is to be collected.

The survey instrument measures BPM, SCA, structural alignment, strategic alignment, IT capability, process flexibility and IT investment (refer to Appendix 3). The measurement scales for each of the variables are adopted and adapted from past researches with the exception of process flexibility. The measurement scales for process flexibility was developed within this study during FGD stage. Table 3.2 summarises the

variables, the sources of measurement scales and number of items involved for each variable:

Table 3.2: Measurement Instruments for all Variables

Variables	Sources	Number of Items
Structural Alignment	Lok et al. (2005)	6
Strategic Alignment	Lok et al. (2005)	7
IT Capability	Aral et al. (2007)	14
Process Flexibility	<i>Developed in this study</i>	6
BPM		
• BPO	• Skrinjar et al. (2008) and	11
• PII	McCormack (2001)	6
	• Lok et al. (2005)	
IT investment	Aral et al. (2007)	5
SCA	Gowen & Tallon (2005)	4

The constructs for all the variables (with an exception of IT investment) were measured using a 5-point scale with anchorage from strongly disagree (1) to strongly agree (5). This usage of Likert scale is easy to respond and takes considerably lesser time to complete when compared to open-ended questions (Churchill, 1979).

3.8.2 Pre-Test

In an effort to determine content validity, the survey instrument was provided to 4 industry experts and 1 academic expert for comments and suggestions for improving the structure and wordings of the questions. Content validity is important to ensure that the instrument indeed measures what it intends to measure. The pre-test phase was executed in September 2011. The persons selected to review the questions were all experts in the areas of process or quality management and included members from both manufacturing as well as services industry.

The following were the experts who reviewed the survey instrument:

- Ms. Azlinda Mohd Ali, Optima Solutions Sdn Bhd.
- Mr. Shanmuga Suntharan Manickam, Western Digital Sdn Bhd.
- Mr. Hew Chee Chung, NTT MSC Sdn Bhd.
- Mr. Siva Subramaniam, Affin Bank Berhad.
- Dr. Kanagi Kanapathy, Faculty of Business & Accountancy, University Malaya.

The experts reviewed the survey instrument and provided comments to the following variable and its corresponding items:

- Structural alignment – the current response time is highly satisfactory to customers.
- Structural alignment – horizontal communication is well practised within the organisation.
- Structural alignment – the organisation structure is relatively flat.
- Structural alignment – there are high barriers between departments.
- Strategic alignment – current strategic plan identifies the projects we actually undertake to improve the organisation’s business processes.
- IT capability – high degree of digitization in purchasing process.
- BPO – the average employee views the business as a series of linked processes.
- BPO – process terms such as input, output, process and process owners are used in conversation in the organisation.
- BPO – processes within the organisation are defined and documented using inputs and outputs to and from our customers.
- BPO – process measurements are clearly defined.
- IT investment – of the organisation wide IT expenditure identified in the above question, the estimated percentage classified as investments in IT to provide information is ...
- SCA – competition faces high cost disadvantage to duplicate the organisations programmes.

Refinements to the questions in the survey were carried out based on the feedback received from the experts. Once the survey instrument was finalised, it was ready to proceed to the next stage, which is pilot test.

3.8.3 Pilot Test

Pilot test was conducted for the purpose of determining the reliability of the survey instrument. Reliability is concerned with ensuring consistency of the measurement instrument. Pilot test is also similar to conducting a trial run to determine the potential problems that may arise during the actual data collection phase. Pilot test can also bring to surface fundamental design issues of the survey instrument. The pilot test phase was carried out in October 2011.

The survey instrument was pilot-tested among a mix of 60 working adults pursuing their MBA with the Faculty of Business and Accountancy, University of Malaya and practitioners of process or quality management. The responses from the survey were compiled and underwent reliability analysis testing.

The reliability analysis indicated that the overall survey instrument was reliable and displays consistency in measuring the instrument. From all the variables, only one item was required to be deleted from structural alignment in order to attain the level of Cronbach's Alpha (α) > 0.7. Table 3.3 below, summarises the outcome of the reliability analysis:

Table 3.3: Reliability Analysis from Pilot Test

Variables	Value of Cronbach's Alpha	Number of Items	Number of Items Deleted
Structural Alignment	0.611	6	1
Strategic Alignment	0.863	7	0
IT Capability	0.888	14	0
Process Flexibility	0.875	6	0
BPO	0.901	11	0
PII	0.912	6	0
IT investment	0.705	5	0
SCA	0.757	4	0

Based on the outcome of the reliability analysis, the item for structural alignment was removed from the overall survey instrument. The sub-sections below outlines the finalised measurement constructs for all variables based on the outcome from pre-test and pilot test.

Structural Alignment

The measurement constructs for structural alignment was adapted from Lok et al. (2005) and consists of the following, finalised 5 items:

- The current response time is highly satisfactory to customers.
- Horizontal communication is well practised within the organisation.
- The organisation structure is relatively flat (less hierarchical).
- Managerial tasks are delegated to front-line staff.
- There are high communication barriers between departments.

The item which was required to be removed based on the reliability analysis was as follows:

- Cross-functional teams have more authority than departmental managers in making day-today decisions.

Strategic Alignment

The measurement constructs for strategic alignment was adapted from Lok et al. (2005) and consists of the following 7 items:

- Strategies are developed based external factors (such as customer needs or competitors' moves).
- The management team has identified core processes.
- Core processes are important input to strategic planning.
- Operational improvements have a direct impact on the organisation's ability to compete.
- Sufficient measures are in place to track the organisation's performance.
- Current strategic plan identifies the projects we actually undertake to improve the organisation's business processes.
- Strategic planning process encourages information sharing and cross-functional cooperation.

IT Capability

The measurement constructs for IT capability was adapted from Aral et al. (2007) and consists of the following 14 items:

- Technical skills of IT staff in the organisation facilitates new technology investments.
- Business skills of IT staff in the organisation facilitates new technology investments.
- IT skills of end users in the organisation facilitates new technology investments.
- Ability to hire new IT staff in the organisation facilitates new technology investments.
- Senior management support for IT projects facilitates new technology investments.
- Business units involvements in IT projects facilitates new IT investments.
- Communication methods such as email, intranets and wireless devices are important for internal communications within the organisation.
- Communication methods such as email, intranets and wireless devices are important for communications with suppliers.
- The organisation has a high degree of digitization in purchasing process – electronic purchase orders/ total purchase orders.
- The organisation has a high degree of digitization in sales process – electronic sales/ total sales.
- The organisation has a high degree of Internet technology use to perform sales force management.

- The organisation has a high degree of Internet technology use to perform employee performance management.
- The organisation has a high degree of Internet technology use to perform employee training.
- The organisation has a high degree of Internet technology use to perform post-sales customer support.

Process Flexibility

The measurement constructs for process flexibility was developed in this study and consists of the following 6 items:

- Processes are created or modified while still complying with key controls.
- Processes are created or modified without compromising shared objectives.
- Processes are designed to detect and respond to changes in the business environment with minimal impact to time, effort, cost or performance.
- There are mechanisms in place to allow easy modifications to processes for improvements.
- New processes are developed or existing processes are simplified rapidly and inexpensively to meet market needs.
- Processes are designed to allow temporary deviation from the current norm/standard.

In addition to the above close-ended question, four open-ended questions were also posed to the respondents in an effort to better understand the level of process deviations allowed and the contributions the deviations make in process improvements.

The following are the open-ended questions posed in the questionnaire:

- Are there any incidents of deviation from current norm/ standard?
- Please elaborate an incident of deviation from current norm/ standard in your organisation (if any).
- Was the incident recorded for future reference?
- Was it taken into consideration for process improvements?

BPM

BPM was measured based on two dimensions – BPO and PII. The measurement constructs for the dimension of BPO was adapted from Skrinjar et al. (2008) and McCormack (2001) and consists of the following 11 items:

- The average employee views the business as a series of linked processes.
- Process terms such as input, output, process and process owners are used commonly in conversations in the organisation.
- Processes within the organisation are defined and documented using inputs and outputs to and from our customers.
- Implementation of information technology is based on the processes, not on functions.
- Jobs are usually multidimensional and not just simple tasks.
- Jobs include frequent problem solving.
- People are constantly learning new things on the job.

- Process measurements are clearly defined.
- Process performance is measured in the organisation.
- Resources are allocated based on process.
- Specific process performance goals are in place.

The measurement constructs for the dimension of PII was adapted from Lok et al. (2005) and consists of the following 6 items:

- There is an increase in the number of employees involved in process improvement initiatives in the last three years.
- The number of process improvement initiatives has increased annually in the last three years.
- The organisation has a formal methodology in place to guide the process improvement initiatives.
- The organisation will definitely continue with process improvement initiatives.
- The overall experience with process improvement initiatives has generally been positive.
- The process improvement initiatives contribute to bottom line improvement.

IT Investment

The measurement constructs for IT investment was adapted from Aral et al. (2007) and consists of the following 5 items:

- Estimated total expenditures on IT (in millions) for the entire organisation (including both internal and outsourced expenditures).
- Of the organisation wide IT expenditure identified above, the estimated percentage classified as IT infrastructure is ...
- Of the organisation wide IT expenditure identified above, the estimated percentage classified as investments in IT made to cut operating cost is ...
- Of the organisation wide IT expenditure identified above, the estimated percentage classified as investments in IT to provide internal information is ...
- Of the organisation wide IT expenditure identified above, the estimated percentage classified as investments in IT to increase sales or market share by providing improved customer service or products is ...

Although the questions for IT investment was based on range selection, it would later be converted to qualitative as low IT investment and high IT investment during data coding stage. This is carried out since IT investment is a moderating variable and used to determine the strength and direction between BPM and SCA (Baron & Kenny, 1986).

SCA

The measurement constructs for SCA was adapted from Gowen & Tallon (2005) and consists of the following 4 items:

- The available resources and capabilities enable effective response to external threats and opportunities.
- A large part of the organisations internal resources and capabilities are not possessed by competitors.
- Competitors are likely to face high cost disadvantage to duplicate the organisations programmes.
- There is vast difference between organisations strategic position and the competitors' strategic position.

3.8.4 Sampling Technique

The study is focused in Malaysia. It is proposed that the target population is based on the 1000 organisations in Malaysia listed in the Malaysia 1000 Directory. The book is a joint effort by Bernama and MATRADE, published under BASIS Publications House Sdn Bhd which is a subsidiary of Bernama. This annual publication is available both in hardcopy as well as softcopy. The book contains listing of 1000 organisations in Malaysia which includes organisations name, correspondence address, email address, capital, industry type and key contact persons. These are established companies that are believed to have BPM practices in their organisations. Similar approach to target 1000 organisations in the study of BPM was done by Hung (2006) and Lok et al. (2005).

All 1000 companies listed in the book were to be contacted and given the opportunity to participate in the survey. The reason for including all 1000 companies was to increase the response rate and address the potential issue of low response. It is known that many organisations refrain from participating in surveys for a number of reasons. Most common reasons are lack of interest, restriction on company policy and no benefit to the organisations participating in the survey.

3.8.5 Survey Medium

The survey instrument will be distributed via online medium and hardcopy booklets. The online medium is developed in a survey website called Survey Monkey. The key contact persons of the organisations in the listing will be contacted through telephone and requested to participate in the survey. They would be given the option to choose between online or hardcopy medium. Based on their preference, either the link will be e-mailed to their email address or the survey booklet will be posted to their company address. Those who were not reachable will be mailed the link to participate in the survey online.

Once the survey instrument is distributed, the respondents will be given two weeks to complete the survey. The respondents will be required to answer all the questions. Once the survey is completed online, the completed responses will be available in the website dedicated for the researcher to compile the data. While the responses from the survey booklet will be mailed back to the researcher. In an effort to improve the response rate, a reminder e-mail will be sent to the organisations yet to

respond to solicit their cooperation in completing the survey. This reminder e-mail will be sent two weeks after the closing date of the survey.

3.8.6 Unit of Analysis

The unit of analysis for this research is the senior management of the 1000 organisations in Malaysia. Senior management includes Chief Executive Officer (CEO), Vice President (VP), Chief Financial Officer (CFO), General Manager (GM) or Senior Manager (SM). According to Hung (2006), the top executive level are considered the most appropriate group to answer questions ranging from aspects of structure, strategy, IT, BPM and SCA. Similar justification was also provided by Lok et al. (2005) in their study.

3.8.7 Data Analysis Plan

The quantitative research aspect of this study will be empirically tested using various data analysis techniques. The various techniques have its specific purpose and will be discussed in the subsequent sub-sections. Data collected from the administration of the survey (either through online or hardcopy) will be captured in SPSS. All the statistical analysis will be carried out either using SPSS or AMOS. Specifically, SPSS is used to for analysing the descriptive statistics of the data collected, testing of assumptions for normality, reliability analysis and EFA while AMOS is used for CFA and to test the measurement model based on SEM.

The data analysis techniques to be used in this study include the following:

- Descriptive statistics of background information of the organisations.
- Descriptive statistics for all variables.
- Testing of assumptions for normality (which includes skewness and kurtosis), homoscedasticity, linearity and multicollinearity.
- Reliability analysis.
- EFA for process flexibility.
- CFA for independent variables which includes structural alignment, strategic alignment, IT capability and process flexibility.
- CFA for SCA which is the dependent variable.
- 2nd order assessment of model for BPM.
- Assessment of the structural model.
- Assessment of the structural model for moderating effect of IT investment.

Data Coding & Treatment of Missing Data

Once data collection phase is complete, the responses for the survey will be captured in SPSS. The data needs to be checked for correctness and completeness. This is to ensure that no error during data entry took place (Hair, Black, Babin, Anderson, & Tatham, 2006). Respondents who mailed back incomplete responses will be contacted and the questionnaire can be completed through telephone interview. However, this is not possible for those respondents who completed the questionnaire using the online medium. For incomplete questionnaires via the online medium, the data needs to be removed from the overall list of data. The final number of data after coding and treatment of missing data will be analysed.

Procedure for Descriptive Statistics

Descriptive statistical analysis is carried out to describe the basic statistics and distribution of the organisations. Basic statistics includes percentages and frequencies. This forms the respondent profile of the data collected for this study. The first section of the survey sought responses with regards to the background information of the organisation, such as the following:

- Nature of industry.
- Industry type.
- Age of the organisation.
- Number of employees in the organisation.
- Market share of the organisation.

Subsequently the mean and standard deviations for all variables are computed and presented. This outlines the descriptive statistics for the variables involved in this study.

Procedure for Testing for Normality

Skewness depicts the tendency of the distribution to deviation from the mean while kurtosis is the measure of relative peakedness or flatness of the distribution. Both skewness and kurtosis explores the curve of the distribution and compares to the normal distribution curve. It is noted that when the values of skewness and kurtosis are equal to zero, the distribution is a perfect match to a normal distribution (Hair et al., 2006; Tabachnick & Fidell, 2001). However, it is accepted that the distribution approximates

that of a normal distribution when the value of skewness is within ± 2.00 of their respective standard errors for significance of 95% and the value of kurtosis is within ± 3.00 of their respective standard errors of significance of 95% (Hair et al., 2006).

Nevertheless, a simpler form of determining distribution can be done through visual examination of the histogram (Hair et al., 2006; Tabachnick & Fidell, 2001). Skewness and kurtosis is to be tested on all variables for this study in order to determine the distribution curve.

Next, homoscedasticity is determined through Bartlett's test. The purpose to test homoscedasticity is to test the assumption that all variables have equal variances. This test is carried out to determine the level of departure from normality (Hair et al., 2006). Homoscedasticity can also be determined through correlation analysis. Correlation is carried out on all the variables. Correlation analysis examines the relationships between the variables. Correlation analysis describes the direction and level of strength of the relationship between the variables. The statistics for correlation is Pearson's correlation, ρ and tested based on statistical significance (Schumacker & Lomax, 2004; Sekaran, 2003).

Finally, testing for linearity is carried out on all the variables. Linearity is examined based on p-plot. The linearity among the variables is determined by the closeness the plots are to the linear line. Linearity also checks for multicollinearity. Multicollinearity can be a concern if it is discovered that there are high correlations among the variables. Multicollinearity is determined by the level of variance inflating factor (VIF) and tolerance. Ideally, the level of VIF should be less than 10 while the level of tolerance should be greater than 0.1, in order to exhibit low levels of

multicollinearity (A. C. Burns & Bush, 2002; Gujarati, 2003; Hair et al., 2006; Malhotra & Birks, 2007).

Procedure for Reliability Analysis

Reliability analysis is concerned with ensuring consistency of the measurement instrument. Reliability analysis is carried out for all the variables in this study. Reliability is measured by the value of Cronbach's Alpha (α) which is required to achieve a level of greater than 0.7 for the items of the variables to be accepted as reliable (Hair et al., 2006; Malhotra & Birks, 2007; Sekaran, 2003). Otherwise, the items of the variables needs to be deleted as suggested by the analysis until finally the value of α is accepted.

Even though the measurement instrument for the variables are adopted and adapted from past studies (with the exception of process flexibility), reliability analysis is still required to be carried out. This is because, the target population and scope of the study is different from past studies. As such, there could be items that may not be applicable or relevant within the context of this study.

Procedure for Exploratory Factor Analysis (EFA)

Factor analysis is an interdependence technique under the family of multivariate analysis with the purpose to identify from a large set of variables, the salient few that can be used for multivariate analysis (Malhotra & Birks, 2007). There are two types of factor analysis used within the scope of this study. The first is EFA which is carried out

for process flexibility. EFA is required for process flexibility as the measurement instrument was developed within this study. For this reason, EFA is not required for the remaining variables in this study as the measurement instruments were adopted and adapted from past studies. EFA is applied to analyse the scale items in order to prove their discriminant validity (Davis & Cosenza, 1993). EFA is measured based on Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and test of significance at 95%. The instrument is regarded as adequate when the value of KMO is between 0.5 to 1.0 (Hair et al., 2006).

Procedure for Confirmatory Factor Analysis (CFA)

CFA is a member of the factor analysis family with the objective of determining unidimensionality and construct validity of the variables. CFA is carried out for all the variables in this study. CFA covers two aspects. The first is as a measure for item purification while the second aspect is for assessing the measurement model. CFA needs to be carried out for item purification first before proceeding to assessing the measurement model. Items purification is based on maximum likelihood estimation whereby the unsuitable items are deleted and retested until the salient few items remain for the variable. This is an iterative process (Bagozzi, Yi, & Phillips, 1991).

Hair et al. (2006) recommends applying trial and error methods with reference to the modification indices until the modification indices reach a satisfactory level of goodness-of-fit for the measurement model to be acceptable. The modification index needs to be greater than 4 to achieve an acceptable level (Hair et al., 2006). CFA is carried out in three stages. The first stage is for the independent variable which includes

structural alignment, strategic alignment, IT capability and process flexibility. Subsequently, CFA is carried out for SCA which is the dependent variable. Finally the 2nd order model for BPM is carried out.

Next, the SEM assumptions are reviewed prior to the assessment of the model which is explained in the subsequent sub-sections.

SEM Assumptions

In order to successfully carry out test on SEM for model assessment, the sample size of the data has to be adequate. It is noted that sample size for SEM testing is required to be much larger as compared to other multivariate tests (Biemer, Groves, Lyberg, Mathiowetz, & Sudman, 1991; Chin, 1998; Hair et al., 2006). The researchers explain that this situation arises because statistical analysis by SEM may be subject to unreliable outcomes with smaller sample sizes. Although Hair et al. (2006) also recommends a minimal sample size of 100 in order to proceed with SEM testing, Iacobucci (2010) believes that a sample size of 100 to 150 is adequate. Therefore it is assumed that the sample size for this study would fulfil the requirements of SEM to assess the model.

Iacobucci (2010) also points out that another important factor for consideration for SEM testing is the number of items used to measure a construct. Ideally, there should be a minimum of three items per construct and last but not least, he also cautions not to be too concerned with fit indices. A good research model should be practically sound and provide good explanations to both academicians and practitioners.

The issue of normality is also a very important assumption when testing using SEM. This is because SEM is sensitive to the characteristics of the distribution of the data. Data that severely deviates from a normal distribution may result in inflating chi-square statistics which in return may cause bias in the outcomes of the coefficient significance and standard errors (Hair et al., 2006; Steenkamp & Baumgartner, 2000; Steenkamp & Trijp, 1991).

Procedure for Structural Model Assessment and Hypotheses Testing

Upon completion of the CFA, assessment for the structural model is carried out. The assessment is carried out on three models. The first model is the full model while the second model is the direct relationship model and finally the third model is the full model with the moderating effect of IT investment. The structural models are assessed based on overall model fit indices to assist in drawing to the conclusion of achieving satisfactory goodness-of-fit (Bentler & Bonnett, 1980; Hair et al., 2006). Although a variety of model fit indices are presented, this study will apply a few indices from three main types of measurements.

First type of index measure to be used in this study is the Absolute Fit Index. This type of index examines the level of effectiveness of the specified model in reproducing the observed data. In other words, this index determines how well the theory fits the sample data collected (Hair et al., 2006). The indices involved and selected for Absolute Fit Index in this study are Normed Chi-Square (CMIN/df) and Root Mean Square Residual (RMR).

The next type of index measure is the Incremental Fit Index. The purpose of this index is to assess how well the specified model fits relative to the baseline model, which typically is the null model where all the observed variables are assumed to be uncorrelated (Hair et al., 2006). The indices involved and selected for this study are Normed Fit Index (NFI) and Comparative Fit Index (CFI).

Last but not least type of index is the Parsimony Fit Index. This index determines the best model among a set of competing models by comparing its fit relative to the models complexity. Parsimony fit is achieved either through a better fit or a simpler model (Hair et al., 2006). The index involved is Parsimony Normed Fit Index (PNFI). The types of measures along with the fit indices are tabulated in Table 3.4:

Table 3.4: Model Fit Indices

(Adapted from Hair, et al. 2006)

Types of Measure	Fit Index	Acceptable Value
Absolute Fit Index – to examine the level of effectiveness the model reproduces data	Normed Chi-Square (CMIN/df)	≤ 3.0
	Root Mean Square of Approximation	≤ 0.08
Incremental Fit Index – model fit to relative baseline model	Normed Fit Index (NFI)	≥ 0.9
	Comparative Fit Index (CFI)	≥ 0.9
Parsimony Fit Index – best model comparing its fit relative to its complexity	Parsimony Normed Fit Index(PNFI)	≥ 0.9

3.9 Interview Sessions

With the completion of the quantitative analysis, the findings will be presented. The findings will be discussed and contrasted with the literature, data and interview sessions. Structured interviews will be conducted to understand further the findings of this study. According to Sekaran (2003), the appropriate numbers of interviews can be conducted until the researcher is satisfied with the outcomes of the interview. Interview sessions has its advantages as this form of data collection presents greater flexibility in adapting, adopting and changing the questions as the interview session progresses (Sekaran, 2003). This mode of soliciting feedback is ideal at this stage of the study as structured questions can be modified based on the flow of the discussion. For this study, interviews with 3 industry experts would be sufficient (Eisenhardt, 1989).

The industry experts will be selected from the list of respondents who had participated in the survey. In order to determine which industry the experts come from will be based on the data collected. If the data collected reveals higher number of respondents from the manufacturing industry, than 2 industry experts will be identified from the manufacturing industry and 1 expert will be identified from the services industry. If the data collected reveals otherwise the ratio will be reversed accordingly.

The purpose of the interviews will be to delve deeper to explain the findings of this study and gain insights on the empirical data collected. As such, visual aids in the form of presentation slides will be used to bring the interviewees up to speed with regards to the intent of the study and variables involved. The interview sessions will be recorded and transcribed for content analysis. The feedback from the 3 industry experts

will also be contrasted among themselves to determine similarity and differences. The analysis would be used to describe the phenomena observed through the empirical findings and help in answering the research questions.

Like all other methods for data collection, interview sessions are also not free from bias. Bias can occur due to lack of trust and rapport between the interviewer and interviewee. In addition, situational bias could also occur due to physical setting of the interview session (Sekaran, 2003). In an effort to reduce bias of interview sessions, the industry experts selected will be from those who had participated either in the FGD, content validity or pilot test. This would indirectly address the concern of bias due to lack of trust and rapport since the interviewees have been engaged in the same study. Situational bias due to physical setting can be overcome by providing the interviewee with the choice of date, time and venue for the interview session to convene. Therefore, the interviewees can have the liberty to select the most appropriate time and place that would be conducive for them to speak freely and be at ease with themselves.

3.10 Chapter Summary

This chapter presents the variables and its relationships in a research model. In order to test the relationships in the model, seven hypotheses were developed. Next, the research design of this study is explained. The research covers both qualitative and quantitative research methods. Qualitative research method using FGD is used for developing the measurement instrument for process flexibility. Subsequently, quantitative research methods using survey technique is employed for data collection.

Prior to actual data collection, pre-test was carried out for content validity followed by pilot test for reliability. The overall survey instrument was refined accordingly and ready data collection. Data collection plan was discussed covering sampling technique and survey medium. The target population for the data collection was 1000 companies listed in the Malaysia 1000 Directory. Online and hardcopy survey mediums are proposed to provide respondents with options to decide on the most convenient medium.

Next the data analysis plan was discussed. Data analysis will be carried out using SPSS and AMOS software. Among the data analysis techniques selected for this study are descriptive statistics, normality testing for multivariate analysis, reliability analysis, EFA for process flexibility, CFA for independent variables, dependent variable and 2nd order assessment for BPM. Finally assessments of the structural models are carried out.

This chapter concludes with the plan for series of interview sessions with industry experts in order to delve deeper on the findings from the study. The feedback from the industry experts will be used to answer the research questions.

CHAPTER 4 DATA ANALYSIS

4.1 Introduction

This chapter presents the data analysis for the data collected. The sub-sections cover the results of every test carried out. This chapter also reports the outcome for all the hypotheses. Data analysis chapter starts with data coding and treatment of missing data. Subsequently the respondent profile is reported followed by descriptive statistics of the variables. Next the variables are reported for conformance of normality. The data analysis proper commences with reliability analysis, EFA for process flexibility and CFA for all variables. Last but not least, hypotheses testing are carried out for full model analysis, mediation and moderation effects of the research model.

4.2 Administration of the Survey

Data collection was carried out using survey method. The medium of the survey included both hardcopy and online medium. The target population of respondents were the 1000 companies listed in the Malaysia 1000 Directory published by BASIS Publications House Sdn Bhd. The companies were contacted and given the option to choose between the online or hardcopy medium. Most companies preferred the online medium as opposed to the hardcopy document. However, in an effort to increase the response rate, hardcopy survey booklets were sent again to companies who did not participate in the survey.

All 1000 companies were invited to participate in the survey. For those who preferred the online medium, a follow-up mail was sent two weeks after the e-mail was sent to them. This was done as a reminder in an effort to increase the response rate for the survey. As for the hardcopy medium, the respondents who mailed incomplete questionnaires were contacted via telephone and the questions were completed through telephone interview.

Data collection period commenced from November 2011 till February 2012. The duration of the data collection took into consideration the year-end holidays and Chinese New Year. The survey instrument consisted of both close-ended questions and open-ended questions. The open-ended questions attempted to obtain some background information of the companies as well as understand further the process deviations and improvements carried out in the companies.

4.3 Response Rate

According to Sullivan (2001), the ideal sample size for a study with the target population of 1000 is 278. The ideal sample size is calculated based on the required confidence level, sampling error, population heterogeneity and population (Sullivan, 2001). The sample size of 278 is based on sampling error of $\pm 5\%$. This number also takes into consideration non-response and ineligibility of the responses received. However it is also noted that there are other schools of thought indicating that a sample size of 100 to 150 is sufficient for performing statistical analysis (Iacobucci, 2010) but in order to run SEM, a minimum sample size of 200 is required (Tabachnick & Fidell, 2001). A total of 274 responses were collected from the data collection phase resulting

in a response rate of 27.4%. A total of 99 responses were gathered through online medium while the remaining 175 responses were gathered through hardcopy medium. The number of responses was close to the desired sample size of 278.

4.4 Data Coding and Treatment of Missing Values

The responses received from data collection were entered in SPSS. Upon completion of data entry, the data was checked for error and completeness. This was done by performing frequency analysis on all the constructs to look for incorrect entries. Responses with more than 50% of unanswered questions were removed. The incomplete questionnaires were mainly from the online medium. The total number of incomplete questionnaires was 26, resulting in the final number of complete and usable responses of 248 or 24.8%.

Next, responses with less than 50% unanswered questions were defined in SPSS as missing values. All missing responses were captured with the value 9 to define as missing values. This was done to ensure that missing values were excluded when performing data analysis. Frequency analysis was again carried out to ensure that there were no more incomplete or missing values in the list of data.

4.5 Profile of Respondents

From the overall responses from the survey, 63 were from the manufacturing industry while the remaining 185 were from the services industry. It is observed that almost 75% of the respondents were from the services industry. In terms of years in

operation, 41.9% of the responses were from establishments that were more than 20 years in existence. The second highest category was those that were in operation between 15 to 20 years which contributed to 18.2%. This indicates that most organisations were very long established. Organisations with 10 to 15 years of operation were 12.5% while 15.7% of organisations were in operation for 5 to 10 years. Only 11.7% of organisations were in operation for less than 5 years.

Next, in terms of employee strength, 33.1% of organisations reported employing less than 100 employees while 21.4% report employing 100 to 300 employees. Organisations employing 300 to 500 employees were 14.5% while 31.0% of responses were from organisations with more than 500 employees. This implies that the profile of companies responding in this survey was spread across the range of very large to relatively small organisations.

Finally, in terms of market share, 38.0% of responses were from organisations with less than 25% market share while 31.0% were from those with 25% to 50% market share. Only 14.9% of responses were from organisations enjoying more than 75% market share. The remaining 16.1% were from organisations with market share from 50% to 75%. This indicates that two-thirds of responses came from organisations with less than 50% market share within their respective industries.

The profile of responses for this study in terms of industry type, years in operation, number of employees and market share is summarised in Table 4.1. Overall the profiles of responses were mainly from large, well established, services companies with average performance.

Table 4.1: Respondent Profile

Profile	Frequency	Percentage
Type of Industry		
Manufacturing	63	25.4%
Services	185	74.6%
Years in Operation		
Less than 5 years	29	11.7%
5 to 10 years	39	15.7%
10 to 15 years	31	12.5%
15 to 20 years	45	18.2%
More than 20 years	104	41.9%
Number of Employees		
Less than 100 employees	82	33.1%
100 to 300 employees	53	21.4%
300 to 500 employees	36	14.5%
More than 500 employees	77	31.0%
Market Share		
Above 75% market share	37	14.9%
50% to 75% market share	40	16.1%
25% to 50% market share	77	31.0%
Less than 25% market share	94	38.0%

4.6 Descriptive Statistics

This section presents the preliminary analysis of the data collected. The analysis covers calculating the mean and standard deviation scores for all items in the questionnaire. The mean scores ranged from 2.32 to 4.09 with the standard deviation scores ranged from 0.864 to 1.381. This indicates that there is a good variation with regards to the responses from the survey.

The structural alignment items had the lowest mean score observed of 3.02 (std dev = 1.020) while the highest mean score observed was 3.57 (std dev = 0.824). When examining the items for strategic alignment, the lowest mean score was 3.67 (std dev = 0.855) while the highest was 3.89 (std dev = 0.821). Moving on to items for IT capability, the lowest mean score was 3.29 (std dev = 1.006) while the highest mean score was 4.09 (std dev = 0.917). As for process flexibility, the highest item mean score was 3.53 (std dev = 0.862) and the lowest mean score was 3.31 (std dev = 0.890).

Moving on to the mediating items, the lowest mean score for BPM was 3.24 (std dev = 0.947) and the highest mean score was 3.70 (std dev = 0.856). For the moderating variable, IT investment items scored the lowest mean score of 2.01 (std dev = 0.989) and the highest mean score of 2.32 (std dev = 1.381). Finally, for the dependent variable, items for SCA observed the lowest mean score of 3.30 (std dev = 0.834) and the highest mean score of 3.48 (std dev = 0.828). Appendix 4 presents the detailed means and standard deviation scores for all items.

In addition, the mean and standard deviation scores for all items, the overall mean and standard deviation scores for all variables were also tabulated. The mean scores ranged from 2.14 to 3.76 while the standard deviation scores ranged from 0.559 to 0.874. IT investment scored the lowest mean with value of 2.14 (std dev = 0.874) while strategic alignment scored the highest mean with value of 3.76 (std dev = 0.669). Table 4.2 presents the mean and standard deviation scores for all seven variables.

Table 4.2: Descriptive Statistics for the Seven Variables

Variables	Mean	Standard Deviation
Structural Alignment	3.29	.559
Strategic Alignment	3.76	.669
IT Capability	3.52	.614
Process Flexibility	3.42	.777
BPM	3.48	.691
IT Investment	2.14	.874
SCA	3.37	.674

4.7 Testing for Normality, Homoscedasticity, Linearity & Multicollinearity

There are several ways to determine normality of the data. Normality is tested to determine whether the distribution of the data approximates that of a normal distribution. This is necessary to determine the next course of testing; using parametric or non-parametric techniques. The first test for normality is done by examining the

values of skewness and kurtosis. The second test is homoscedasticity which is tested by examining the correlation among the variables. Next is to test linearity by observing the p-plot graphs for all variables. Last but not least, multicollinearity is tested by examining the VIF and tolerance values for all variables.

4.7.1 Normality

Skewness examines the deviation of the data from the mean while kurtosis examines the relative peakedness of the distribution. For a distribution to be considered normal, the skewness value must be within ± 2.00 standard error of skewness and within ± 3.00 standard error of kurtosis (Hair et al., 2006). Statistics for skewness for structural alignment was -0.123 while kurtosis was 0.448. Strategic alignment had statistics for skewness of -0.772 and kurtosis was 1.591. IT capability observed statistics for skewness of -0.245 and kurtosis of 0.896. Next, process flexibility had statistics for skewness of -0.748 and kurtosis of 0.699. BPM had statistics for skewness of -0.642 and kurtosis of 0.610. IT investment on the other hand had statistics for skewness of 0.743 and kurtosis of 0.441. Finally, SCA had statistics for skewness of -0.387 and kurtosis of -0.025. Table 4.3 summarises the skewness and kurtosis for all variables.

Table 4.3: Testing for Normality using Skewness and Kurtosis

Variables	Skewness		Kurtosis	
	Statistics	Standard Error	Statistics	Standard Error
Structural Alignment	-.123	.155	.448	.309
Strategic Alignment	-.772	.156	1.591	.310
IT Capability	-.245	.157	.896	.313
Process Flexibility	-.748	.164	.699	.327
BPM	-.642	.164	.610	.326
IT Investment	.743	.160	.441	.320
SCA	-.387	.165	-.025	.329

Hence it can be concluded that structural alignment, IT capability and SCA are approximately normally distributed.

Strategic alignment, process flexibility, BPM and IT investment are not normally distributed but somehow do not have serious departure from normality, since the skewness values are less than ± 1.00 . Moreover, p-plots for these variables are also charted out to visually inspect for normality. Based on visual verification of the charts displayed in Appendix 5, the presence of linearity is observed across all variables. This further attests that the distribution of all the variables have no indication of severe departure from normality.

4.7.2 Linearity and Homoscedasticity

In terms of correlation analysis, it is observed that structural alignment had moderate strength of relationship with BPM ($\rho = 0.528$) but low strength of relationship with IT investment ($\rho = 0.185$). Strategic alignment had strong strength of relationship with BPM ($\rho = 0.737$) and low strength of relationship with IT investment ($\rho = 0.329$). IT capability on the other hand had moderate strength of relationship with process flexibility ($\rho = 0.668$) and low strength of relationship with IT investment ($\rho = 0.388$). Process flexibility observed similar correlation strength pattern as strategic alignment. Process flexibility had strong strength of relationship with BPM ($\rho = 0.798$) and low strength of relationship with IT investment ($\rho = 0.320$). BPM observed low strength of relationship with IT investment ($\rho = 0.392$). Finally SCA had moderate strength of relationship with BPM ($\rho = 0.529$) and low strength of relationship with IT investment ($\rho = 0.316$). Table 4.4 presents the correlation analysis for the purpose of determining homoscedasticity among the variables. The values of Pearson correlation coefficient are presented in matrix format across all variables.

Although all variables are significantly correlated to one and another, the correlation between them are low to moderate in strength, with the exception of correlation between process flexibility and BPM. Thus, it can be assumed that linearity and homoscedasticity between the items for the variables are achieved (since the variables are not too highly correlated).

Table 4.4: Analysis for Linearity and Homoscedasticity using Correlation

Variables	V1	V2	V3	V4	V5	V6	V7
Structural Alignment (V1)	1.000						
Strategic Alignment (V2)	.525	1.000					
IT Capability (V3)	.422	.631	1.000				
Process Flexibility (V4)	.457	.699	.668	1.000			
BPM (V5)	.528	.737	.663	.798	1.000		
IT Investment (V6)	.185	.329	.388	.320	.392	1.000	
SCA (V7)	.349	.424	.446	.522	.529	.316	1.000

4.7.3 Multicollinearity

Finally, in testing multicollinearity, with SCA as the dependant variable, it is observed that the VIF for all variables are less than 10 while the tolerance values are more than 0.1. Structural alignment observed VIF of 8.294 and tolerance of 0.121. Strategic alignment on the other hand observed VIF of 2.609 and tolerance of 0.383. Next, IT capability had VIF of 2.235 and tolerance value of 0.447. Process flexibility had VIF of 3.014 and tolerance value of 0.332. BPM had VIF of 3.311 and tolerance of 0.302. Finally, IT investment had VIF of 1.234 and tolerance of 0.810. The results are presented in Table 4.5.

Table 4.5: Analysis for Multicollinearity

Variables	VIF	Tolerance
Structural Alignment	8.294	.121
Strategic Alignment	2.609	.383
IT Capability	2.235	.447
Process Flexibility	3.014	.332
BPM	3.311	.302
IT Investment	1.234	.810

When summarising all the tests for normality, it can be concluded that the distribution of the data does not indicate any serious departure from normality. Hence, further statistical analysis can be performed using parametric techniques.

4.8 Reliability Analysis

Reliability analysis is carried out on all variables to determine if the measurement scale is indeed measuring what it is supposed to measure. Reliability is analysed to determine the adequacy of internal consistency based on Cronbach's Alpha (α) coefficient. When the value for α is greater than 0.7, then the item scales are regarded as reliable (Hair et al., 2006).

It is observed that all variables achieved the required level of α value without having to delete any items with the exception of structural alignment, which required one item to be deleted. After the item was deleted, structural alignment achieved α value

of 0.691. This value can be considered a close approximation to 0.7. Strategic alignment achieved α value of 0.905 while IT capability achieved α value of 0.914. Process flexibility on the other hand achieved α value of 0.928 while BPM and IT investment achieved α value of 0.957 and 0.823, respectively. Finally, SCA achieved α value of 0.823. Since all the variables achieved α value exceeding 0.7, hence, the overall survey instrument appears to have achieved the required level of internal consistency. The Cronbach's α for the variables are tabulated in Table 4.6.

Table 4.6: Reliability Analysis

Variables	Cronbach's Alpha (α)	Number of Items	Number of Items Deleted
Structural Alignment	.691	4	1
Strategic Alignment	.905	7	0
IT Capability	.914	14	0
Process Flexibility	.928	6	0
BPM	.957	17	0
IT Investment	.823	5	0
SCA	.823	4	0

4.9 Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis (EFA) was performed on process flexibility since this was the only variable whereby the items were developed in this study. EFA was carried out for the purpose of purifying and validating the items for process flexibility. As for the other variables, the items were adopted and adapted from past studies.

Therefore EFA was not necessary and those variables could be directly applied for CFA. EFA for process flexibility is measured using KMO measure of sampling adequacy using principal component analysis as the extraction method.

The value of KMO for process flexibility was 0.901 and the Bartlett's test of sphericity indicates p value as 0.000. Based on the results, it can be concluded that all items for process flexibility are salient since KMO was within the range of 0.5 to 1.0 while significance was less than α value of 0.05. Hence, all items for process flexibility can be retained and used in the multivariate analysis. In addition, the EFA also revealed only 1 component with eigenvalue of 4.421 which is greater than 1 with 73.7% of the variance explained. Table 4.7 charts out the results of EFA.

Table 4.7: EFA for Process Flexibility

KMO and Bartlett's Test				Results		
KMO Measure of Sampling Adequacy				.901		
Bartlett's Test of Sphericity – Chi Square				1005.159		
Df				15		
Significance				.000		

Total Variance Explained						
Initial Eigenvalues				Extraction Sum of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.421	73.681	73.681	4.421	73.681	73.681
2	.555	9.254	82.935			
3	.349	5.810	88.744			
4	.257	4.277	93.022			
5	.226	3.769	96.791			
6	.193	3.209	100.000			

4.10 Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) falls under the techniques used for determining discriminant validity (Davis & Cosenza, 1993). The purpose of CFA is to determine the salient items that represent a particular variable (Malhotra & Birks, 2007). AMOS software was used to perform CFA. Before the full model, mediation and moderation effects are explored, the independent variables and dependent variables

needs to be analysed. As such, CFA was first applied for the independent variables and dependent variables followed by second order model for BPM.

For the independent variables measurement model, dependent variable measurement model and second order measurement model for BPM, CFA was carried out to evaluate the unidimensionality and validity of the items. This was done through multiple iterations of CFA on the measurement models for item purification. Item purification involves identifying unsuitable items in the measurement model and deleting those items from the measurement models. CFA is then run again and again until the parameter estimates produces satisfactory goodness-of-fit of the measurement model.

The modified measurement model for the CFA for independent variables has satisfactory goodness-of-fit with relative chi-square value $CMIN/df$ of 2.486, RMSEA of 0.078, NFI of 0.857, CFI of 0.908 and PNFI of 0.679. The model summary as indicated in Table 4.8 show presence of absolute fit and incremental fit, however lacking of parsimony fit.

The satisfactory goodness-of-fit for the measurement model of the independent variables were achieved after two items were deleted from structural alignment variable, one item deleted from strategic alignment and seven items deleted from IT capability. In total, 10 items were deleted from the overall measurement model. There were no items required to be deleted from process flexibility. The reasons for deleting the 10 items were due to large error covariance among the items and standardized loadings (λ) values that were less than 0.5.

The standardized loadings (λ) for all remaining constructs were greater than 0.5 with significant corresponding t-values. Overall, these results indicate unidimensionality among the constructs for independent variables. Figure 4.1 contains the diagram and Table 4.8 presents the output of CFA for the independent variables.

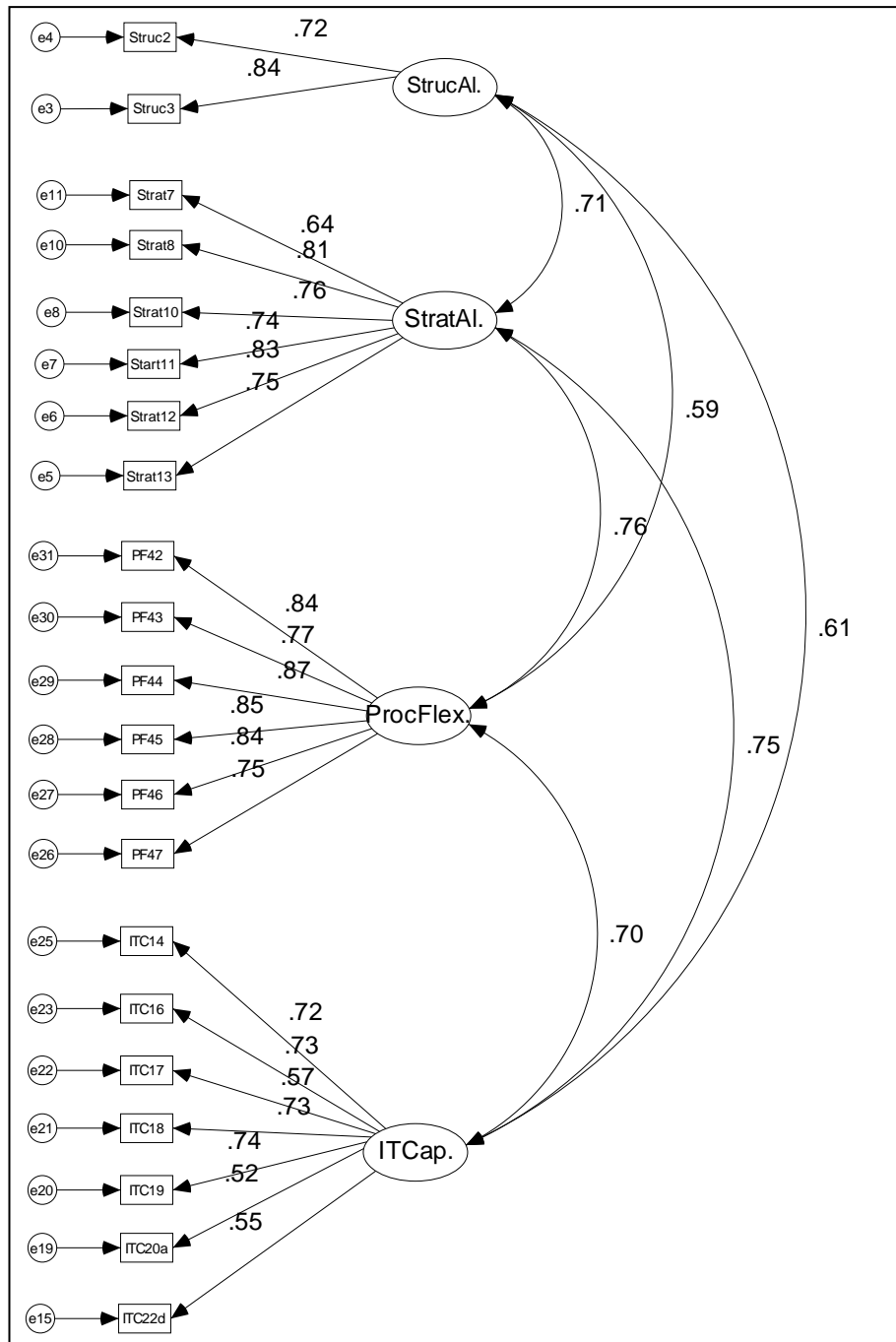


Figure 4.1: CFA Diagram for Independent Variables

Table 4.8: CFA Output for Independent Variables

Types of Measure	Fit Index	Acceptable Value	Observed Value
Absolute Fit Index – to examine the level of effectiveness the model reproduces data	CMIN/df	≤ 3.0	2.486
	RMSEA	≤ 0.08	.078
Incremental Fit Index – model fit to relative baseline model	NFI	≥ 0.9	.857
	CFI	≥ 0.9	.908
Parsimony Fit Index – best model comparing its fit relative to its complexity	PNFI	≥ 0.9	.679

Similarly CFA for the dependent variable, SCA, has satisfactory goodness-of-fit with relative chi-square value CMIN/df of 1.772, RMSEA of 0.056, NFI of 0.989, CFI of 0.995 and PNFI of 0.198. The model summary as indicated in Table 4.9 show presence of absolute fit and incremental fit, however lacking of parsimony fit. There were no items required to be deleted for the variable SCA.

Nevertheless, the standardized loadings (λ) for all constructs were greater than 0.5 with significant corresponding t-values. These results indicate unidimensionality among the constructs for the dependent variable. Figure 4.2 contains the diagram and Table 4.9 presents the output of CFA for the dependent variable.

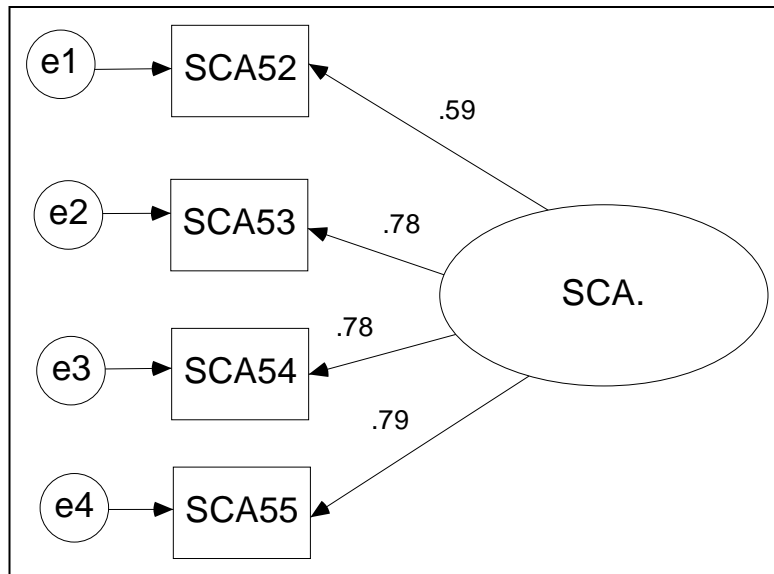


Figure 4.2: CFA Diagram for Dependent Variable (SCA)

Table 4.9: CFA Output for Dependent Variable (SCA)

Types of Measure	Fit Index	Acceptable Value	Observed Value
Absolute Fit Index – to examine the level of effectiveness the model reproduces data	CMIN/df	≤ 3.0	1.772
	RMSEA	≤ 0.08	.056
Incremental Fit Index – model fit to relative baseline model	NFI	≥ 0.9	.989
	CFI	≥ 0.9	.995
Parsimony Fit Index – best model comparing its fit relative to its complexity	PNFI	≥ 0.9	.198

4.11 Confirmation of 2nd Order Latent Variables

This study required second order latent variables testing since BPM was examined as the determinants to the independent variables to SCA. Second order model for BPM has satisfactory goodness-of-fit with relative chi-square value CMIN/df of 2.384, RMSEA of 0.075, NFI of 0.942, CFI of 0.965 and PNFI of 0.614. The second order model summary indicates presence of absolute fit and incremental fit, however lacking of parsimony fit.

This was achieved after five items were deleted from BPO and one item deleted from PII. The reasons for deleting the 6 items were due to large error covariance among the items and standardized loadings (λ) values that were less than 0.5.

The standardized loadings (λ) for all remaining constructs were greater than 0.5 with significant corresponding t-values. These results indicate unidimensionality among the constructs for the second order model. Figure 4.3 contains the diagram and Table 4.10 presents the output of CFA for the second order model for BPM.

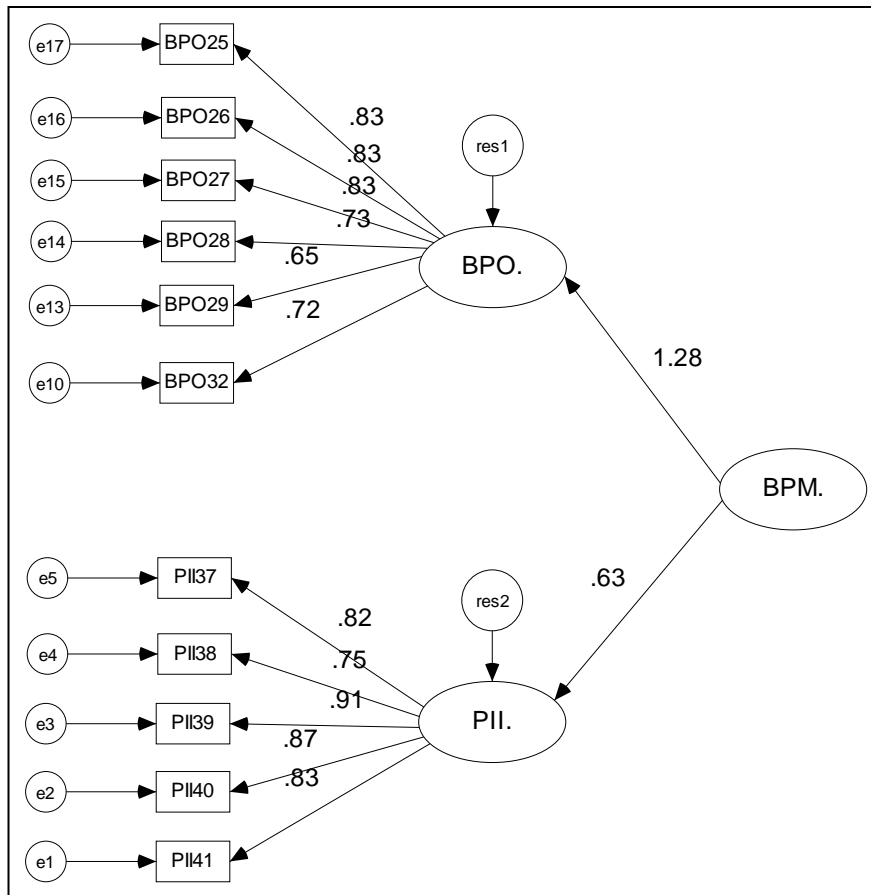


Figure 4.3: CFA Diagram for Second Order Model for BPM

Table 4.10: CFA Output for Second Order Model for BPM

Types of Measure	Fit Index	Acceptable Value	Observed Value
Absolute Fit Index – to examine the level of effectiveness the model reproduces data	CMIN/df	≤ 3.0	2.384
	RMSEA	≤ 0.08	.075
Incremental Fit Index – model fit to relative baseline model	NFI	≥ 0.9	.942
	CFI	≥ 0.9	.965
Parsimony Fit Index – best model comparing its fit relative to its complexity	PNFI	≥ 0.9	.614

4.12 Full Structured Model

In order to test the relationship between the variables, the independent variables, dependent variable and second order model for BPM were combined into a single model. This full structured model is a representation of the research model. The full structured model shows moderately satisfactory goodness-of-fit with relative chi-square value CMIN/df of 2.228, RMSEA of 0.071, NFI of 0.796, CFI of 0.874 and PNFI of 0.694. The full structured model summary indicates presence of absolute fit, however lacking of incremental fit and parsimony fit. Nevertheless, the standardized loadings (λ) for all constructs were greater than 0.5 with significant corresponding t-values.

Figure 4.4 contains the diagram and Table 4.11 presents the output for the full model including the estimates, standard errors (s.e.) and p-values. Based on Table 4.11, it is observed that there is significant relationship between structural alignment and BPM with $\beta = 0.169$ (s.e. = 0.077) and p-value = 0.023 which is less than $\alpha = 0.05$. Similarly, significant relationship between strategic alignment and BPM was observed with $\beta = 0.2119$ (s.e. = 0.099) and p-value = 0.024 which is less than 0.05. However, no significant relationship was observed between IT capability and BPM since $\beta = 0.002$ (s.e. = 0.104) and p-value = 0.974 exceeding $\alpha = 0.05$.

Next, highly significant relationship between process flexibility and BPM was observed with $\beta = 0.653$ (s.e. = 0.076) and p-value = 0.000. Last but not least, highly significant relationship was observed between BPM and SCA with $\beta = 0.587$ (s.e. = 0.066) and p-value = 0.000.

In addition, the R^2 for BPM was 89.6%, indicating that all the variables understudied contributed to about 90% of the variance explained in BPM. On the other hand, the R^2 for SCA was 34.5%, indicating that all the variables understudied contributed to about 35% of the variance explained in SCA.

Overall, it can be summarised that significant relationships were observed between structural alignment, strategic alignment and process flexibility with BPM and BPM with SCA, although no significant relationship was observed between IT capability and BPM.

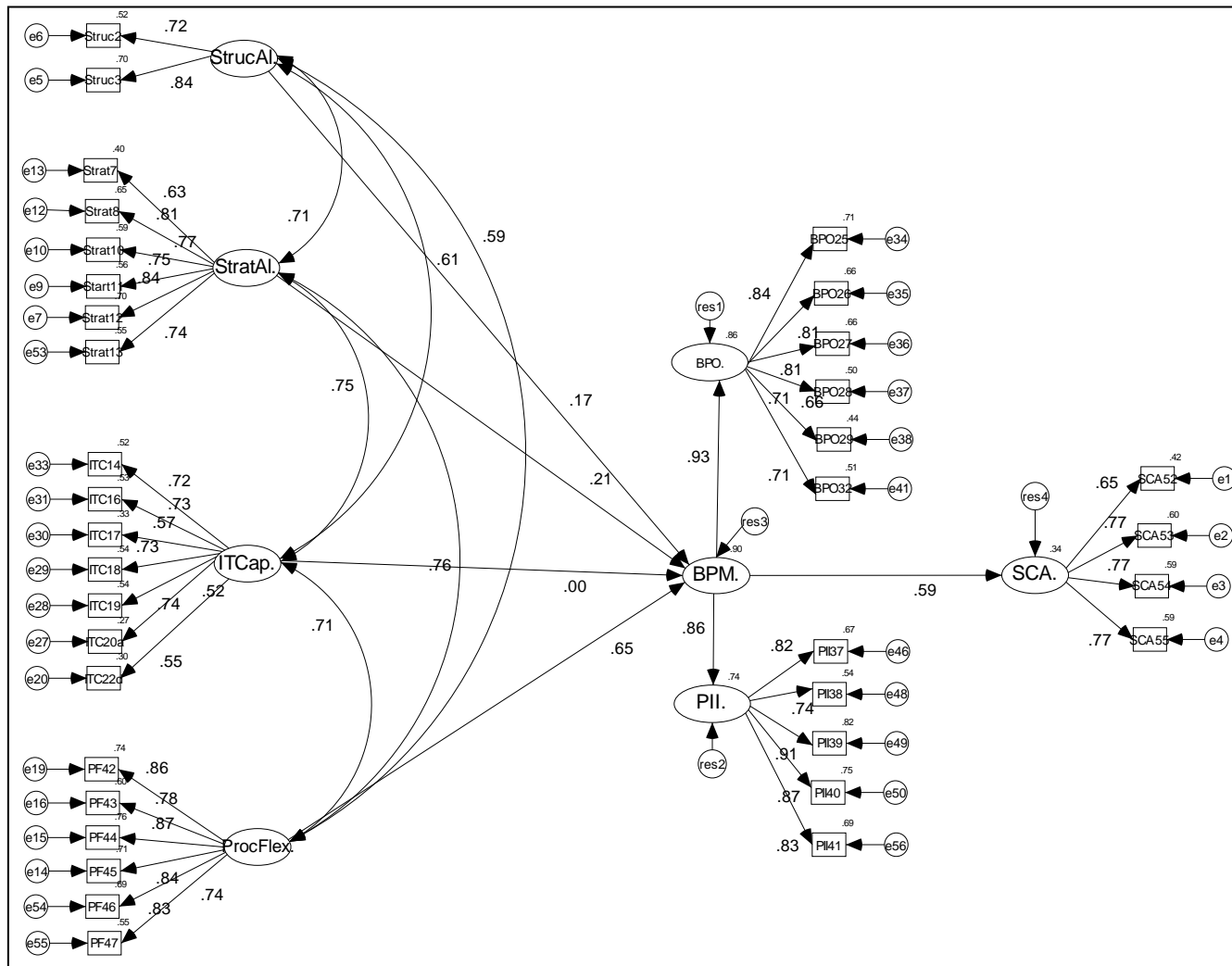


Figure 4.4: Full Model Analysis

Table 4.11: Output for Full Model

Model Fit Summary:			
Types of Measure	Fit Index	Acceptable Value	Observed Value
Absolute Fit Index – to examine the level of effectiveness the model reproduces data	CMIN/df	≤ 3.0	2.228
	RMSEA	≤ 0.08	.071
Incremental Fit Index – model fit to relative baseline model	NFI	≥ 0.9	.796
	CFI	≥ 0.9	.874
Parsimony Fit Index – best model comparing its fit relative to its complexity	PNFI	≥ 0.9	.694

Standardised Regression Analysis:			
Relationship	Estimates	s.e.	p-value
BPM \leftarrow Structural Alignment	.169	.077	.023
BPM \leftarrow Strategic Alignment	.211	.099	.024
BPM \leftarrow IT Capability	.002	.104	.974
BPM \leftarrow Process Flexibility	.653	.076	.000
SCA \leftarrow BPM	.587	.066	.000

4.13 Mediating Role of BPM

In order to test the mediating effect of BPM, the direct relationship between the independent variables to the dependent variable needs to be compared with the full model. Hence, the direct relationship between the independent variables and the dependent variable was analysed.

The direct relationship model has moderately satisfactory goodness-of-fit with relative chi-square value CMIN/df of 2.224, RMSEA of 0.070, NFI of 0.797, CFI of 0.875 and PNFI of 0.691. The direct relationship model summary indicates presence of absolute fit, however lacking of incremental fit and parsimony fit. Nevertheless, the standardized loadings (λ) for all constructs were greater than 0.5 with significant corresponding t-values.

Figure 4.5 contains the diagram and Table 4.12 presents the output for the direct relationship model including the estimates, s.e. and p-values. Based on Table 4.12, it is observed that there is no significant relationship between strategic alignment and SCA since $\beta = -0.278$ (s.e. = 0.139) with p-value = 0.113 exceeding 0.05. Similarly, there is no significant relationship between process flexibility and SCA since $\beta = 0.350$ (s.e. = 0.164) with p-value = 0.142 which is more than 0.05. From the above results, it can be summarised that BPM fully mediates the relationships between strategic alignment and process flexibility with SCA.

However, it is observed that there is a significant direct relationship between structural alignment and SCA since $\beta = 0.333$ (s.e. = 0.106) and p-value = 0.015 which is less than $\alpha = 0.05$. In this situation, when examining and comparing the λ values, it is observed that $\lambda = 0.333$ for the direct relationship between structural alignment and SCA while $\lambda = 0.099$ for the relationship between structural alignment and SCA when mediated by BPM ($0.169 \times 0.587 = 0.099$). Hence, it can be observed that BPM partially mediates the relationship between structural alignment and SCA. The relationship between IT capability and SCA was not explored as it was already established that IT capability did not influence BPM.

When examining the χ^2 values, it is observed that χ^2 for the full model was 1294.315 with degrees of freedom of 581, while the χ^2 for direct relationship model was 1283.381 with degrees of freedom of 577. Hence, the difference of χ^2 is as follows:

$$\begin{aligned} \Delta \chi^2 &= \chi^2 (\text{full model}) - \chi^2 (\text{direct relationship model}) \\ &= 1294.315 - 1283.381 \\ &= 10.934 \end{aligned}$$

In addition, when examining the change to CMIN/df, it is observed that the CMIN/df for the full model was 2.228 while the CMIN/df for the direct relationship model was 2.224.

Overall, it can be summarised that BPM fully mediates the relationship between strategic alignment and process flexibility to SCA. However BPM only partially mediates the relationship between structural alignment and SCA.

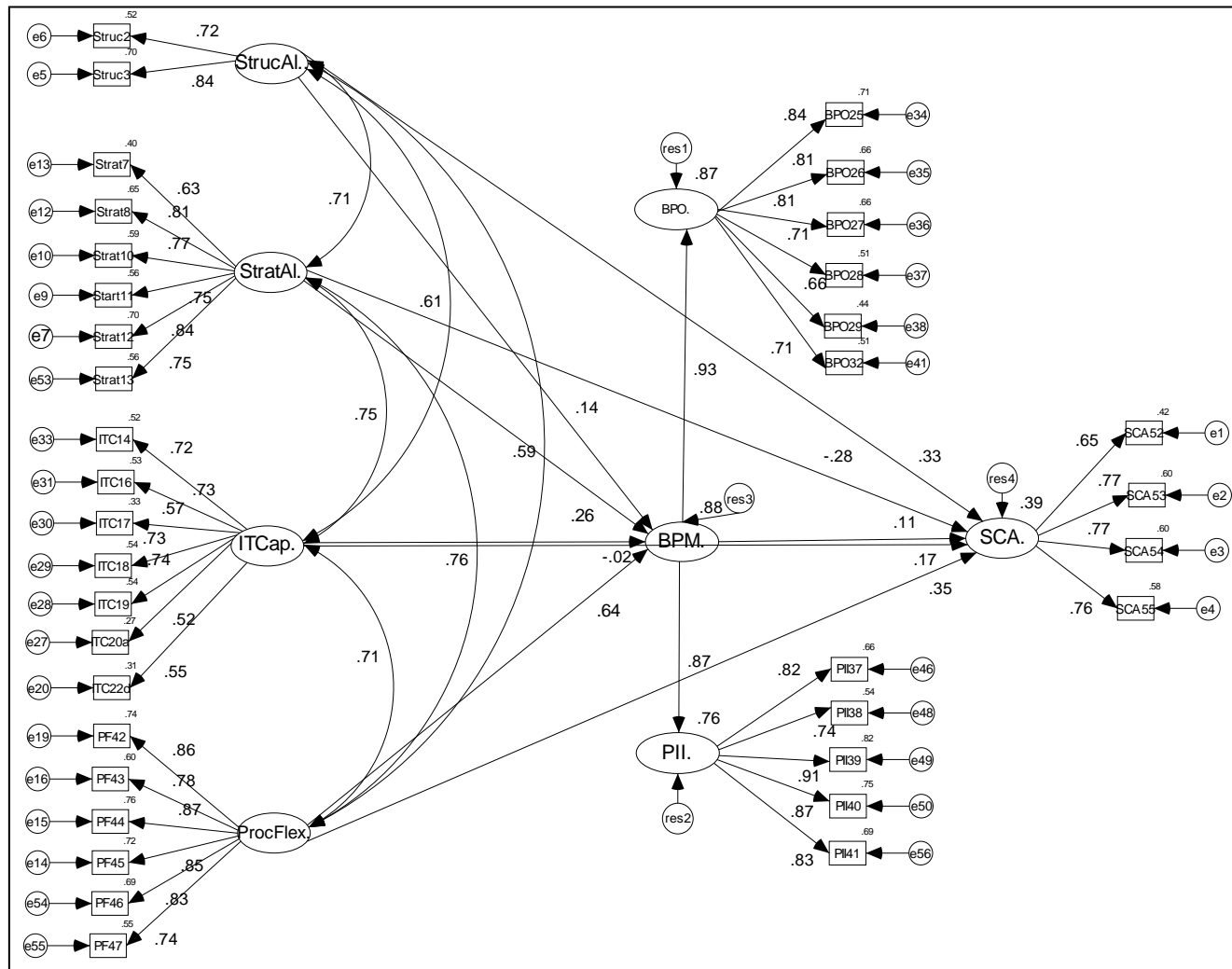


Figure 4.5: Direct Relationship Analysis

Table 4.12: Output for Direct Relationship

Model Fit Summary:			
Types of Measure	Fit Index	Acceptable Value	Observed Value
Absolute Fit Index – to examine the level of effectiveness the model reproduces data	CMIN/df	≤ 3.0	2.224
	RMSEA	≤ 0.08	.070
Incremental Fit Index – model fit to relative baseline model	NFI	≥ 0.9	.797
	CFI	≥ 0.9	.875
Parsimony Fit Index – best model comparing its fit relative to its complexity	PNFI	≥ 0.9	.691

Standardised Regression Analysis:			
Relationship	Estimates	s.e.	p-value
SCA ← Structural Alignment	.333	.106	.015
SCA ← Strategic Alignment	-.278	.139	.113
SCA ← IT Capability	.175	.131	.171
SCA ← Process Flexibility	.350	.164	.142

4.14 Moderating Effect of IT Investment

Finally the moderating effect of IT investment on the relationship between BPM and SCA was tested. This was done by creating a new variable by multiplying the values of BPM and IT Investment. The modified model for moderating effect has satisfactory goodness-of-fit with relative chi-square value CMIN/df of 2.333, RMSEA of 0.073, NFI of 0.848, CFI of 0.906 and PNFI of 0.740. The moderating relationship model summary indicates presence of absolute fit and incremental fit, however lacking of parsimony fit. Nevertheless, the standardized loadings (λ) for all constructs were greater than 0.5 with significant corresponding t-values.

The χ^2 for full model was 1294.315 with degrees of freedom of 581, while the χ^2 for full model with moderation was 1355.515 with degrees of freedom of 581. Hence, the difference of χ^2 is as follows:

$$\begin{aligned}\Delta \chi^2 &= \chi^2 (\text{full model}) - \chi^2 (\text{full model with moderation}) \\ &= 1294.315 - 1355.515 \\ &= - 61.2\end{aligned}$$

In addition, when examining the change to CMIN/df, it is observed that the CMIN/df for the full model was 2.228 while the CMIN/df for the moderating relationship model was 2.333.

Based on the difference of χ^2 values, significant relationship was observed between BPM and SCA when moderated by IT investment. In addition to that, based on the results from Table 4.13, it is observed that the relationship between BPM to SCA when moderated by IT investment is highly significant since $\beta = 0.440$ (s.e. = 0.011) with p-value = 0.000. Figure 4.6 contains the diagram and Table 4.13 presents the output for the moderating relationship model including the estimates, s.e. and p values. Therefore, it can be summarised that IT investment moderates the relationship between BPM and SCA.

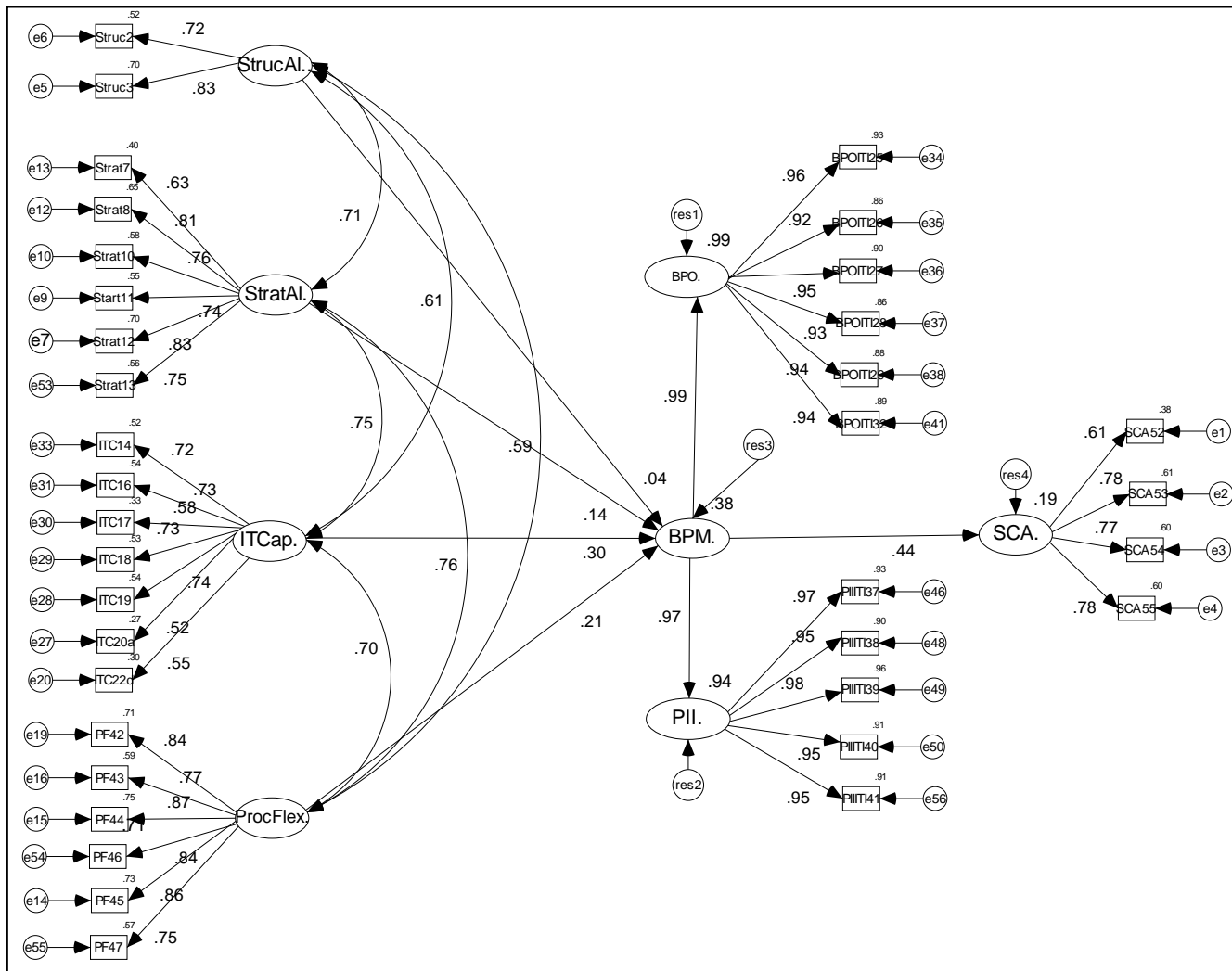


Figure 4.6: Moderating Relationship Analysis

Table 4.13: Output for Moderating Relationship

Model Fit Summary:			
Types of Measure	Fit Index	Acceptable Value	Observed Value
Absolute Fit Index – to examine the level of effectiveness the model reproduces data	CMIN/df	≤ 3.0	2.333
	RMSEA	≤ 0.08	.073
Incremental Fit Index – model fit to relative baseline model	NFI	≥ 0.9	.848
	CFI	≥ 0.9	.906
Parsimony Fit Index – best model comparing its fit relative to its complexity	PNFI	≥ 0.9	.740

Standardised Regression Analysis:			
Relationship	Estimates	s.e.	p-value
BPM*IT Investment \leftarrow Structural Alignment	.035	.591	.737
BPM*IT Investment \leftarrow Strategic Alignment	.140	.773	.301
BPM*IT Investment \leftarrow IT Capability	.296	.857	.010
BPM*IT Investment \leftarrow Process Flexibility	.214	.511	.039
SCA \leftarrow BPM*IT Investment	.440	.011	.000

4.15 Results of Hypotheses Testing

Based on the results from the SEM analysis, the hypotheses are examined to determine if the results rendered support to the hypotheses made in this study.

The relationship between structural alignment and BPM is examined based on Figure 4.4 and Table 4.11. The standardised estimate for the path connecting structural alignment to BPM is 0.169 with p-value of 0.023. The p-value is less than α value of 0.05. This indicates that the data collected provides significant evidence of the relationship between structural alignment and BPM. Hence, the hypothesis is supported.

H1: Structural alignment has positive impact on BPM.

Next, in examining the relationship between strategic alignment and BPM, Figure 4.4 and Table 4.11 are referenced again. The standardised estimate is 0.211 with p-value of 0.024. The p-value is less than α value of 0.05. This indicates that significant evidence of the relationship between strategic alignment and BPM is observed. Hence, H2 is supported.

H2: Strategic alignment has positive impact on BPM.

When examining the relationship between IT capability and BPM, the standardised estimate from Figure 4.4 and Table 4.11 indicate 0.002 with p-value of 0.974. Since the p-value is greater than α value of 0.05, it is concluded that the data

collected failed to observe significant relationship between IT capability and BPM. Hence, H3 is not supported.

H3: IT capability has positive impact on BPM.

Figure 4.4 and Table 4.11 indicate standardised estimate as 0.653 with p-value of 0.000 for the link between process flexibility and BPM. Since p-value is less than α value of 0.05, this indicates that there is evidence of significant relationship between process flexibility and BPM. Hence, H4 is supported.

H4: Process flexibility has positive impact on BPM.

In order to explain the outcome for H5, Figures 4.4 and 4.5 together with Tables 4.11 and 4.12 need to be referenced. The mediation effect of BPM to structural alignment, strategic alignment and process flexibility and SCA is examined. The mediating effect of BPM to IT capability and SCA is not examined since it has been established that IT capability is not influenced by BPM.

The hypotheses H1, H2 and H4 earlier indicated evidence of significant relationships between structural alignment, strategic alignment and process flexibility to BPM. Now, it is necessary to examine the existence of direct relationship between structural alignment, strategic alignment and process flexibility with SCA. Figure 4.5 and Table 4.12 is referenced to examine the standardised estimates and p-values.

The standardised estimate for the relationship between structural alignment to SCA is 0.333 with p-value of 0.015 which is less than α value of 0.05. It is hence concluded that significant relationship exist between structural alignment to SCA. The next step then would be to compare the strength of the relationships, i.e. the mediating relationship with the direct relationship. The mediating relationship has strength of 0.099 while the strength of the direct relationship is 0.333. Therefore, it can be concluded that BPM partially mediates the relationship between structural alignment to SCA.

As for the relationship between strategic alignment to SCA, the standardised estimate is -0.278 with p-value of 0.113, which is greater than α value of 0.05. Hence, this study failed to find any significant direct relationship between strategic alignment and SCA. Therefore, it can be concluded that BPM fully mediates the relationship between strategic alignment and SCA.

Similarly, the standardised estimate for the relationship between process flexibility and SCA is 0.350 with p-value of 0.142, which is greater than α value of 0.05. This study failed to find any significant direct relationship between process flexibility and SCA, therefore, it can be concluded that BPM fully mediates the relationship between process flexibility and SCA.

Overall, BPM fully mediates the relationships between strategic alignment and process flexibility with SCA while partially mediating the relationship between structural alignment and SCA. Hence, this indicates that H5 is supported.

H5: BPM act as the mediation on the relationship between the four organisational factors (structural alignment, strategic alignment, IT capability and process flexibility) and SCA.

The relationship between BPM and SCA is examined based on Figure 4.4 and Table 4.11. The standardised estimate for the path connecting BPM to SCA is 0.587 with p-value of 0.000 which is less than α value of 0.05. This indicates that the data collected reveals highly significant relationship between BPM and SCA. Hence, H6 is supported.

H6: BPM has positive impact on SCA.

The relationship between BPM and SCA that is moderated by IT investment is examined based on Figure 4.6 and Table 4.13. The standardised estimate for the path connecting BPM to SCA is 0.440 with p-value of 0.000. The p-value is less than α value of 0.05 indicating that the data collected reveals highly significant relationship between BPM and SCA that is moderated by IT investment. In addition, when comparing the difference between χ^2 for full model and full model with moderation, the difference in χ^2 is 61.2. Since the χ^2 difference is greater than 10, it further supports that BPM that is moderated by IT investment has significant relationship to SCA. Hence, H7 is supported.

H7: IT investment acts as the moderator on the relationship between BPM and SCA.

In summary, the results from the statistical analysis reveal that Hypotheses 1, 2, 4, 5, 6 and 7 are supported while Hypothesis 3 is not supported. Table 4.14 summarises the outcome of the hypotheses testing.

Table 4.14: Outcomes of Hypotheses Testing

Hypotheses	Outcomes
H1: Structural Alignment has positive impact on BPM.	Supported
H2: Strategic Alignment has positive impact on BPM.	Supported
H3: IT Capability has positive impact on BPM.	Not Supported
H4: Process Flexibility has positive impact on BPM.	Supported
H5: BPM act as the mediation on the relationship between the four organisational factors (structural alignment, strategic alignment, IT capability and process flexibility) and SCA.	Supported
H6: BPM has positive impact on SCA.	Supported
H7: IT investment acts as the moderator on the relationship between BPM and SCA.	Supported

4.16 Open-Ended Questions Analysis for Process Flexibility

In addition to the analyses of the close-ended questions, there were several questions posed to the respondents to understand further the level of process flexibility adopted in their organisations. The questions primarily aimed at understanding the level of deviations absorbed by the organisation and the necessary steps that were taken to inculcate the deviation into the process improvement activities. From the 248 usable responses, only 223 respondents answered at least one open-ended question.

The first question sought to understand if there were any incidents of deviation from the current norm or practice. For this question, 33% of the respondents answered 'yes' while 66% answered 'no' and the remaining 1% did not respond to this question. This reveals that majority of the organisations do not allow situations whereby deviations are allowed to take place.

Those that answered 'yes' to the first question, were requested to proceed to the subsequent question. The next question asked if the incidents of deviations were recorded for future reference. To this question, 44% answered 'yes' while 43% answered 'no' and the remaining 13% did not respond. This reveals that from those organisations that allowed deviations to take place, only half took the necessary steps to record the incident for reference.

However, the third question asked if the incident of deviation was taken into consideration for process improvement. To this question, 50% answered 'yes' while 37% answered 'no' and the remaining 13% did not respond. This reveals that at the very least, incidents of deviations are examined in organisations during process improvement initiatives. Table 4.15 below presents the breakdown of responses for all the three open-ended questions for process flexibility.

Table 4.15: Responses to Open-Ended Questions

Variables	Percentage of Respondents Answering “Yes”	Percentage of Respondents Answering “No”	Percentage of Respondents Not Providing Any Answer
Are there any incidents of deviation from current norm/standard?	33%	66%	1%
Was the incident recorded for future reference?	44%	43%	13%
Was it taken into consideration for process improvements?	50%	37%	13%

Overall, the responses to the open-ended questions revealed that the general processes within the organisations are stable and are not subject to major deviations from the norm. It was revealed that while some organisations take the necessary steps to document the changes to their processes, there were also many organisations that do not make the attempt to document the deviations to their processes. However, a substantial number of organisations do consider the deviations experienced for future process improvements. This indicates that the level of process flexibility within the Malaysian context is relatively mature with most organisations displaying a sense of maturity in facing market uncertainties and changing customer requirements.

4.17 Analysis of Interview Sessions

Interviews were conducted on three respondents who participated in the survey. They were individuals from the services and manufacturing industries with two representing the services industry while one interviewee representing the manufacturing industry. The ratio of 2:1 for services and manufacturing industries were determined to match the respondent profile of the survey, whereby more than two-thirds were from the services industry. The interview sessions took place from 17th to 25th July 2012 at the interviewees' office premises. The interviewees were contacted and were asked to spare 30 minutes of their time for an interview session in an effort to understand further the data collected from the survey.

The following are the 3 interviewees who agreed to be interviewed:

- Mr. Wan Mohd Nazmi bin Wan Ahmad Najid, JARING Communications Sdn Bhd.
- Mr. Shanmuga Suntharan Manickam, Western Digital Malaysia.
- Mr. Hasnul Fadhly Hasan, former employee of Extol MSC Berhad.

The data analysis did not uncover significant relationship between IT capability and BPM. In addition to that, no significant relationship was also observed between IT capability and SCA. Therefore, the interview questions were designed to understand the potential reasons behind this phenomenon. The interview form is available in Appendix 6 while the questions posed to the interviewees were as follows:

- Is IT capability crucial in your organisation?
- In what way is IT capability related to your organisations SCA?
- In what way is IT capability related to your business processes?
- In my study on the Malaysian companies, it was observed that IT capability was not related to SCA. What is your opinion of this finding about IT capability within the Malaysian context?
- In my study on the Malaysian companies, IT capability was not related to BPM. What is your opinion of this finding about IT capability within the Malaysian context?

The interview sessions were fruitful in providing potential reasons to explain the nature of IT capability in Malaysian organisations. Before the interview session commenced, the interviewees were briefed on the purpose of the interview and was allowed a few minutes to review the interview questions. The sessions were interactive and the interviewees were allowed to ask questions to clarify their understanding before attempting to answer the questions. The interview sessions were recorded with the consent of interviewees. The interview sessions were later transcribed and the verbatim is included in Appendix 7.

The first interviewee was Mr. Wan Nazmi of JARING Communications Sdn Bhd. The interview was held on 17th July 2012. JARING Communications Sdn Bhd is a telecommunications service provider and was established since 1992. Mr. Wan Nazmi holds the position of General Manager for Corporate Development and Services Division. During the interview session, Mr. Wan Nazmi shared his experience in JARING Communications Sdn Bhd. He believed that IT capability was not only

important but was a necessity in ensuring smooth operations of business activities. Referring to the business context of JARING Communications Sdn Bhd, he believed that top management assumes that IT capability is developed to help in executing the strategies and as such should be able to create SCA. However, he does acknowledge that top management usually do not monitor the effectiveness of the IT capability. There could be a multitude of reasons for this but in his opinion the main factors could be due to time constraint and other priorities that would require their urgent attention.

Similarly, IT capability is the tool that organisations use to ensure processes are executed efficiently. When reflecting the telecommunications industry, he further explains that organisations are so consumed in reacting to the market changes and the need to be able to move quickly that may result in poor execution of IT capability to develop SCA.

In explaining the insignificant relationship between IT capability and BPM, Mr. Wan Nazmi believes that the possible reasons for procuring IT capability was to adopt best practice processes but in reality what happens is that the software undergoes tremendous changes to match the current processes in the organisation. As such, organisations fail to realise the true benefit and potential of IT capability. Another possible explanation is the level underutilisation of IT capability which may not contribute to the ability to increase the efficiency and effectiveness of BPM.

Last but not least, Mr. Wan Nazmi believes that people and their skills are an important factor in realising IT capability along with adequate change management activities. These four factors could be the potential failing of IT capability in Malaysian organisations.

Mr. Shanmuga of Western Digital Malaysia was interviewed on 19th July 2012. Western Digital is a manufacturing company and has its presence in Malaysia since 1973. Western Digital started out as a custom semiconductor packaging company before moving on to manufacturing hard disk drives. Mr. Shanmuga holds the position of Project Manager in Western Digital. During the interview session, Mr. Shanmuga shared that IT capability was very minimal in the manufacturing line but was more relevant in the sales and marketing and support divisions. The reason for less emphasis of IT capability in the manufacturing line was because it would result in huge investments and impact to production time and employee training time. This would inevitably impact production volume.

He elaborated further that for Western Digital, their structure and processes are very lean and efficient. Their BPM practices are proven to cater to the market conditions and customer needs effectively. IT capability is not believed to bring about SCA as speed to market and superior supply chain is the driver for SCA. Mr. Shanmuga concurs with the findings of the study that IT capability does not have any positive influence on BPM or SCA. In Western Digital, IT capability can involve huge impact on cost as the machines and software are very expensive. It also involves major disruptions to the production line. The impact of the change itself can be costly since it would result in production downtime.

The third interview with Mr. Hasnul (who chose to share his experience as the Deputy Director at Extol MSC Berhad) took place on 25th July 2012. The company was established since 1984 and is involved in providing ICT security services. Mr. Hasnul shares his experience that IT capability is crucial in their industry whereby their services are to cater to address ICT security issues. The top management are usually aware and

understand the importance of IT capability in realising organisational strategic objectives and SCA. However, what is lacking is the enforcement to ensure the action plans are executed effectively. IT capability is the key driver in creating SCA for his organisation.

Mr. Hasnul does agree with the results of the study which indicates IT capability does not have significant relationship with BPM. He believes it is due to top management direction and alignment. He adds that how IT capability is translated to BPM activities are not explicitly communicated and cascaded down. This results in mismatch between objectives and implementation. He strongly believes that communication cannot be assumed to have taken place or one cannot assume that the communication is effective by mere announcements. Explicit, to him refers to breaking down the information to actual activities that can be clearly understood by all levels of employees.

Another possible explanation provided by Mr. Hasnul is that management's objectives are too idealistic. This could be due to their level of experience or pressures from stakeholder demands. However, the organisation and the employees tend to suffer trying to achieve the set objectives which in the onset is not possible to be achieved by the organisation. In the absence of realignment, the failed implementation is not realised until it is too late.

Lastly Mr. Hasnul shares that in his experience, he has observed that the business divisions of the organisation lacks the clarity in setting clear requirements. When the business requirements are unclear, it is challenging to develop suitable IT

capability. As such, the IT capability procured or developed may not be suitable with the BPM activities of the business divisions.

The experiences shared by the three interviewees were compiled and documented. The feedback would be used in the discussion of findings and conclusion chapter to aid in answering the research questions and addressing the problem statement.

4.18 Chapter Summary

This chapter on data analysis commences with the actual administration of the survey and response rate. Subsequently, the data coding and treatment of missing data are explained. This is followed by the analysis of the respondents in terms of industry type, years in operation, number of employees and market share.

Descriptive statistics on all the seven variables follow suit. Next, testing of normality is carried out. Since all the data conforms to a normal distribution, the data collected is then ready for multivariate analysis. Reliability analysis is carried out to determine the internal consistency of the items. This is followed by EFA for process flexibility. EFA was only carried out for process flexibility since the instrument for this variable alone was developed in this study. As for the remaining variables, they were obtained from past studies. CFA was then conducted on the independent variables and dependent variable. This was followed by validation of the CFA for the second order model for BPM. Once satisfactory goodness-of-fit was observed in all instances, the overall structural models were assessed.

Full model analysis, direct relationship analysis and moderating effects analysis were carried out in order to test the seven hypotheses. The outcomes of the hypotheses testing were briefly discussed. Six out of the seven hypotheses were supported. This chapter concluded with the outcome of the interview sessions with the 3 industry experts in an effort to understand the hypothesis that was not supported.

CHAPTER 5 DISCUSSION AND CONCLUSION

5.1 Introduction

Chapter 5 briefly discusses the findings of the data analysis and recaps the outcomes of the hypotheses testing. From the discussions and findings, the research questions are answered and the problem statement is addressed. This chapter draws the thesis to a closure with limitations, suggestions for future research, practical implications and conclusion.

5.2 Revisit of Overall Study

This study set out to determine the influence of BPM and SCA. From the literature review, it is observed that although the concept of BPM has been in existence for more than 2 decades, nevertheless, there are opportunities for conducting empirical evidence to strengthen the theoretical foundation to assist practitioners and academics to better understand the importance of BPM. It is also noted that the existing literature of BPM is comprehensive in conceptual papers using case studies but lacks substantial empirical research to facilitate theory building and validation of key characteristics of BPM. In addition to that, the current studies on BPM and SCA is based on resource-based view and not dynamic capability theory. Dynamic capability theory is believed to be more comprehensive since it caters for the dynamic nature of the internal and external business environment in which an organisation operates.

In addition to that, this study is closely refers to the study by Trkman (2010) who suggests to combine dynamic capability theory, contingency theory and task-technology fit theory into a single framework for empirical testing. For this reason, structural alignment, strategic alignment, IT capability, process flexibility and IT investment were identified for this study based on the Trkman (2010), in addition to BPM and SCA.

Semler (1997) proposed to conduct further research on structural alignment and determine its influence on competitive advantage through BPM. It is believed that structure on its own may not be able to create SCA and can leverage on BPM in order to increase the competency of BPM. Jeston & Nelis (2006), Neubaer (2009) and Trkman (2010) suggested further research on the relationship between strategic alignment and BPM. Although strategic alignment can directly influence SCA, nevertheless, BPM outcomes are greater enhanced if it is directed from strategy. Structural alignment and strategic alignment represent the variables under contingency theory.

Task-technology fit theory is represented by IT capability and IT investment. Bharadwaj (2000) proposed further research on the impact of IT capability on BPM as the competency of BPM can be greatly enhanced with the influence of the right IT capability. Finally, Mata et al. (1995), Neubaer (2009), Walsh et al. (2010) and Trkman (2010) suggested further research to be conducted to determine the mechanism in which IT investment can be applied on BPM to create SCA. A properly structured and operational BPM can enjoy greater performance benefits through IT investments and as a result may increase the level of SCA.

Dynamic capability theory is represented by process flexibility, BPM and SCA. Trkman (2010) suggested further research for process flexibility on BPM indicating that process flexibility provides the appropriate foundation for BPM to allow changes and improvements to be effected efficiently. He also suggests empirically testing BPM on SCA. With the problem statement and research questions justified by gaps from the literature review, data collection and analysis followed suit.

Data collection covered the 1000 companies listed in the Malaysia 1000 Directory. A total of 248 complete responses were obtained and analysed. Data analysis commenced with profile of respondents, descriptive statistics, normality testing, reliability analysis, EFA for process flexibility, CFA, full model analysis, mediating effect analysis, moderating effect analysis, open-ended questions analysis, hypotheses testing and analysis of interview sessions.

Profile of the 248 respondents indicated 75% of respondents from the services industry with 69% enjoying market share of less than 50%. This reveals that the findings of the study is more related to the services industry rather than manufacturing industry. Although more than half of the respondents were from organisations that were not in market leader position, yet the respondents were able to articulate the importance and relevance of BPM on SCA. The descriptive statistics and normality testing revealed no serious departure from a normal distribution and as such was suitable for parametric testing. With that, the reliability analysis, EFA and CFA were carried out. Finally SEM was performed to test the hypotheses.

There were seven hypotheses involved in this study. Based on data collection and analysis, six hypotheses were supported and one hypothesis was not supported. The data analysis chapter also documented the open-ended questions for process flexibility and recorded summary of interview sessions with three respondents from the survey. The interviewees were contacted and requested to share their experience to help explain the hypothesis that was not supported. The information on the whole, will be the source of input to explain the findings of the research. Table 5.1 provides a recap of the seven hypotheses with their corresponding outcomes while Figure 5.1 maps the outcome of the hypotheses to the research model described in Chapter 3 earlier.

Table 5.1: Recap of Outcomes of Hypotheses Testing

Hypotheses	Outcomes
H1: Structural Alignment has positive impact on BPM.	Supported
H2: Strategic Alignment has positive impact on BPM.	Supported
H3: IT Capability has positive impact on BPM.	Not Supported
H4: Process Flexibility has positive impact on BPM.	Supported
H5: BPM act as the mediation on the relationship between the four organisational factors (structural alignment, strategic alignment, IT capability and process flexibility) and SCA.	Supported
H6: BPM has positive impact on SCA.	Supported
H7: IT investment acts as the moderator on the relationship between BPM and SCA.	Supported

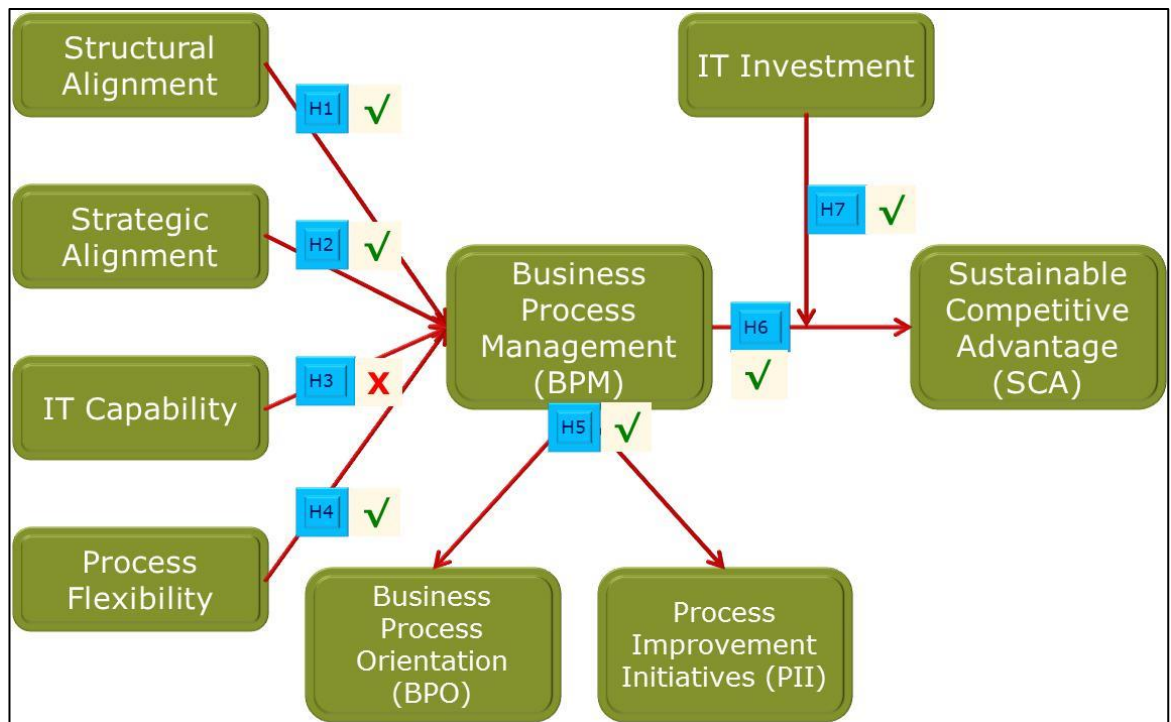


Figure 5.1: Research Model Mapped with Hypotheses Test Results

5.3 Discussion of Findings

The research model and hypotheses were designed to answer the research questions of this thesis. As mentioned in Chapter 1, this study involved investigating the answers to four research questions. The primary aim of the study was to determine the relationship between BPM and SCA. Next, the study sought to identify the determinants of BPM in achieving SCA. The determinants are structural alignment, strategic alignment, IT capability and process flexibility. Lastly, this study attempted to explain the moderating effects of IT investment on the relationship between BPM and SCA. These research questions were posed to address the problem statement of this study. Table 5.2 maps out the relationship between the problem statement, research questions and hypotheses. The subsequent sections provide answers to each research question of this study.

Table 5.2: Problem Statement, Research Questions and Hypotheses

Problem Statement	Research Questions	Hypotheses
The level of mediation of BPM on the relationship between the four antecedents namely structural alignment, strategic alignment, IT capability and process flexibility on SCA needs to be understood.	1. What are the factors that enable BPM? 3. How does BPM mediate the relationship between the four antecedents, namely structural alignment, strategic alignment, IT capability and process flexibility to SCA?	H1: Structural Alignment has positive impact on BPM. H2: Strategic Alignment has positive impact on BPM. H3: IT Capability has positive impact on BPM. H4: Process Flexibility has positive impact on BPM. H5: BPM act as the mediation on the relationship between the four organisational factors (structural alignment, strategic alignment, IT capability and process flexibility) and SCA.
The level of impact of BPM on SCA has yet to be discovered.	2. What is the relationship between BPM and SCA?	H6: BPM has positive impact on SCA.
IT investment's moderation effect on the relationship between BPM and SCA needs to be understood.	4. What is the level of moderation by IT investment on the relationship between BPM and SCA?	H7: IT investment acts as the moderator on the relationship between BPM and SCA.
There is no common measurement instrument for process flexibility for the use of both manufacturing and services industries.	<i>Note: The measurement instrument for process flexibility is addressed by conducting qualitative analysis using FGD.</i>	

Research Question 1: What are the factors that enable BPM?

There are four variables involved in this study, namely, structural alignment, strategic alignment, IT capability and process flexibility. From the results of the data analysis for Hypotheses 1, 2 and 4, it was observed that structural alignment, strategic alignment and process flexibility positively influence BPM. However, the results for Hypothesis 3 failed to observe significant influence of IT capability over BPM.

Structural Alignment and BPM

As pointed out by Trkman (2010) and concurred in this study, structural alignment is important in increasing the effectiveness of BPM. The right organizational structure fosters its strategies to be cascaded down to the operational level more effectively. This notion was previously advocated by Weill & Olson (1989), Kearns & Lederer (2004) and Vergidis et al. (2008), indicating that a proper fit can accelerate organizational performance. In this study, proper structure allows greater efficiency and effectiveness in the management of processes.

In addition to that, the outcome of this study corroborates with the findings of the study by Hung (2006) that structure and BPM work hand in hand in meeting customer demands. Since within the context of this study, BPM includes BPO and PII, the study also supports the notion by Kettinger & Grover (1995) that structural alignment influences PII. The findings from this study supports Sever (2007) claim that BPM activities such as process management and improvements can only be effectively carried out when the structure allows for horizontal communications across the departmental structures. Semler (1997) believes that the right structure allows the

process, systems and people to function in harmony. This study proves that the right structure allows processes to function effectively.

Burns & Wholey (1993) in their study on hospitals in U.S reported that matrix structures were effective in contributing to continuous improvement. Similarly, Richardson (2007) believed that BPM activities can be ineffective in instances when organisations were still operating based on the traditional functional-based structure. Vergidis et al. (2008) go on to explain that processes are treated as separate entities to the structure which could potentially cause a disjoint in the effectiveness of BPM. The questions for structural alignment for this study did not attempt to determine the organizational structure type. The questions for structural alignment in this study was focused on meeting customer needs, effective horizontal communications across the organizational structure, less hierarchical structure and delegation of tasks to front line staff. These aspects of structural alignment proved to influence BPM. This indicates that regardless of structure type, be it matrix structure or traditional functional-based structure, the key elements of structural alignment to BPM are cross-functional communications, teamwork and the ability to address customer needs swiftly. The findings from this study coincide with Goldkuhl & Lind (2008) who believe that BPM is a communications and coordination tool to facilitate the delivery of results.

Strategic Alignment and BPM

The outcome of the data analysis indicates that strategic alignment has significant positive relationship with BPM. This reveals that organisations in Malaysia have effectively aligned their operational activities to their strategic activities. The

results provide empirical support to the notion of Trkman (2010) that strategic alignment needs to be linked with BPM.

The findings from this study concur with Beer et al. (2005) and Joyce & Slocum (2012) that constant alignment and fit of strategies to operational activities are required to be conducted by organisations. This effort itself is a capability for organisations in order to stay competitive. Beer et al. (2005) also cautioned that lack of integration may cause failure in the implementation of strategic plans. The questions raised were related to the ability of organisations to align and fit their strategies to BPM.

Contrary to the findings of Neubauer (2009) who reported that 60% of respondents in his study do not align their strategies to BPM, this study revealed otherwise. Richardson (2007) too warned that in many cases, top management assumes that crafted strategies are aligned to BPM by their middle management and are ignorant when the efforts were ineffective or failed. However, in this study, there appears awareness from top management on core processes and care is given in crafting strategies that are aligned towards improving operational and BPM activities. In addition, effectiveness of implementation of strategies are also measured and communicated back to top management.

Another possible explanation for the relationship between strategic alignment and BPM is the effectiveness of the top management. Jeston (2008) believe that strategic alignment to BPM can be achieved when the leadership spends time and effort to understand BPM and provide the necessary support and empowerment to employees to improve their processes to align themselves with the set strategic direction.

IT Capability and BPM

The findings from this study failed to observe significant relationship between IT capability and BPM. One possible explanation to this finding is that the challenge in realizing the full benefits of IT capability on BPM due to complexity and size of legacy systems as advocated by Lepments et al. (2012). Another possible explanation is by Ranganathan & Dhaliwal (2001) who believe that inadequate IT expertise of resources within the organization can hamper the effectiveness of IT capability on BPM.

The results of this study did not concur with Law & Ngai (2007), Vergidis et al. (2008) and Neubauer (2009) that the full potential of BPM can be realized through IT capability. Another possible explanation to this phenomena was offered by Kearns & Lederer (2003) and Neubauer (2009) who recommends leadership in organisations to have a mix of IT and business skills. Kearns & Lederer (2003) in their study revealed that top management needs to be involved in both IT and business planning so that IT capabilities can be achieved along the organisations value chain activities. In addition to that, Peak et al. (2011) believe that IT employees' lack of understanding of business goals could hamper the effectiveness of IT capability on BPM.

Another possible explanation is mentioned by Kearns & Lederer (2003) indicating that the effectiveness of IT capability on BPM could be difficult to ascertain since IT implementations are usually costly and time-consuming. This notion was concurred by Mr. Shanmuga of Western Digital Malaysia during his interview session. When there is poor understanding on the impact of IT capability on business outcomes, than there would be minimal effectiveness (Peppard & Ward, 2004). In addition, Ullah

& Lai (2011) explain that the effectiveness of IT capability is difficult to realize due to rapidly changing internal and external environments.

Mr. Wan Nazmi of JARING Communications Sdn Bhd, during his interview session believed that the root cause was the assumptions made by top management that the IT capability procured or developed are in fact aiding in implementing the strategies and adding value to the value chain. Yet, no tracking mechanisms may be put in place to actually ensure the effectiveness of IT capability on BPM. This was concurred by Mr. Hasnul of his experience in Extol MSC Berhad.

Another possible reason offered by Mr. Wan Nazmi was that instead of improving the existing processes to follow the best practice embedded in IT capability, the reverse takes place. Organisations spend a lot of money on enhancements to change the IT capability to match their current processes which may not be the most efficient or effective way of carrying out the operational activities. The concern of IT employees skills was also raised as a potential cause for the lack of significant relationship between IT capability and BPM.

Process Flexibility and BPM

Soffer (2004) aptly regarded process flexibility as an aspect of capability that can influence BPM. This study provided empirical evidence to support Soffer (2004). The questions on process flexibility were centered on the ability of organisations to adapt their current processes to cater to changes in the market environment without compromising shared objectives. It appears that within the business environment in

Malaysia, this holds true. This was also advocated by Parthasarthy & Sethi (1992), Aggarwal (1995), Yung & Chan (2003) and Chou et al. (2008).

Contrary to the findings of Hong & Kim (2002) on ERP implementation success, this study provided significant evidence that process flexibility influences BPM. The study by Hong & Kim (2002) reported that process adaption does not moderate the relationship between organizational fit and ERP implementation success. One possible explanation to this observation is that process flexibility is independent of the level of technological adoption in an organization. Regardless whether the process are automated or performed manually, process flexibility is the platform that accommodates deviations to the current norm. As such, process flexibility is more related to the approach organisations take in facing market turbulence and customer needs.

A case study by Tienari & Tainio (1999) on a Finnish Bank reported that top level management views process flexibility at the organizational structure level while the middle management views process flexibility at the business process level. This study reveals that process flexibility resides at the operational level where BPM resides and is capable of responding to unplanned events. Furthermore, it appears that Malaysian firms allow for deviations at the BPM level without incurring too much impact on cost, time and effort (Sanchez & Perez, 2005)

Fitzgerald & Siddiqui (2002) believed that one of the possible reasons for high failure rates of process improvements and reengineering were due to inflexibility in the processes. Therefore a potential reason for a positive relationship between process flexibility was the availability of the right platform to accommodate exceptions and

changes in a timely fashion. Organisations in Malaysia tend to exhibit a high degree of allowance for process changes or deviations. This indicates that Malaysian organisations are sensitive to customer needs and has a sense of urgency when attempting to meet customer demands.

Research Question 2: What is the relationship between BPM and SCA?

The outcome of the testing of Hypothesis 6 revealed that BPM has positive significant relationship with SCA. The outcome of this study concurs with Kearns & Lederer (2003) that BPM is an enabler to SCA. The components of BPM are day-to-day management of processes and process improvement activities. BPM has the potential for creating distinctive competencies that are valuable, rare and difficult for competitors to duplicate or substitute with other capabilities.

BPM is the blueprint of how organisations' deliver results to their customers (Goldkuhl & Lind, 2008; Lee & Dale, 1998; Zairi, 1997). Each organisation, even though in the same industry has unique BPM elements. As such, this findings from this study concurs that BPM when properly managed and harnessed can create distinctive competency that can be translated to SCA. Hung (2006) in his study provided empirical evidence on the impact of BPM on organisational performance. He added that in addition to organisational performance, BPM has the potential to increase SCA.

The questions posed on BPM were pertaining to process documentation, implementation, measurement and improvements. It appears that in line with McCormack (2001) and Skrinjar et al. (2008), BPM contributes towards organisational

performance and in this study, has the potential to build competitive advantage that is unique.

Research Question 3: How does BPM mediate the relationship between the four antecedents, namely structural alignment, strategic alignment, IT capability and process flexibility to SCA?

The outcome of the data analysis for Hypothesis 5 revealed that structural alignment, strategic alignment and process flexibility are determinants of BPM in influencing SCA. Since IT capability was not observed to influence BPM, the mediating effects of BPM on IT capability to SCA was not examined. The findings concur with the literature that the right structure, strategy and flexible platform allows BPM to operate more effectively, thus increasing the level of SCA.

The possible explanation for the mediating effect is based on the nature of BPM which provides the central platform for systems, processes and people to come together in harmony (Zairi, 1997). BPM is one of the enablers to allow organisational capabilities to be transformed to distinctive competency. When the right structure and strategy comes in synergy to the operational level, the effectiveness of BPM in creating SCA can be achieved. In addition, is the adequate platform that allows for deviations to respond to market conditions and customer needs.

Although Richardson (2007) and Vergidis et al. (2008) cautioned that structure, strategy and IT can hamper BPM and its ability to create SCA, this study proved otherwise. The possible explanation is that organisations in Malaysia are sensitive towards customer needs and is willing to go the extra mile to deliver their customers

expectations. As such, the structure, strategy and process flexibility allows BPM to be improved and altered to create SCA. One possible reason is the need to stay competitive and delight customers.

Research Question 4: What is the level of moderation by IT investment on the relationship between BPM and SCA?

The outcome of testing Hypothesis 7 revealed that the relationship between BPM and SCA is moderated by IT investment. Kearns & Lederer (2004) and Teng et al. (1996) advocate that adequate IT investments can render greater performance which can be translated to increased SCA.

Contrary to the findings of Dasgupta et al. (1999), the findings from this study reveal that IT investment increases the influence of BPM on SCA. The study by Dasgupta et al. (1999) discovered that IT investments had negligible effects productivity, cost effectiveness and organisational performance. However, this study offers that when BPM is harnessed to create SCA, the effectiveness of BPM can be increased through IT investments. The findings from this study prove that the notion by Lee & Dale (1998) is still relevant. Lee & Dale (1998) and Trkman (2010) believe that IT investments on BPM can increase the efficiency and effectiveness of BPM in improving organisational performance. Peppard & Ward (2004) indicate that IT investment on its own cannot create SCA, however when IT investment through another medium may be able to create SCA. The results from this study confirm that IT investments can increase the influence of BPM on SCA.

From a practical point of view, it can be explained that when an organisations operational processes are running effectively, IT investment can be applied to the processes to increase its efficiency (Prasad & Heales, 2010; Celuch et al., 2007; Weill & Aral, 2006). This would result in improved productivity and cost effectiveness which can increase SCA.

5.4 Addressing the Problem Statement

The previous sections reviewed the results of the data analysis and the outcomes of the hypotheses testing in order to answer the research questions. The next step is to address the problem statement. The study commenced with the problem that BPM and its influence on SCA was not clearly understood, lacked empirical evidence and atheoretical. As such, this study combined dynamic capabilities theory, contingency theory and task-technology fit theory in a research model to explain the relationship between BPM and SCA. In addition, the determinants of BPM were also examined. The determinants of BPM were outlined as structural alignment, strategic alignment, IT capability and process flexibility. Furthermore, there was a need to understand the moderating effects of IT investment on the relationship between BPM and SCA. Finally, since the available measurement instrument for process flexibility was inadequate, this study also set out to develop a suitable measurement instrument for process flexibility that could be applied to both the manufacturing and services industries.

During the literature review phase, the gaps in the literature for all the variables were identified. This helped in the design of the research model and the development of the hypotheses. Next, the measurement instrument for process flexibility was developed based on FGD. With the development of the measurement instrument, the overall survey questions were finalised. Upon completion of data collection and analysis, the hypotheses were tested and the research questions were answered. The study provides empirical evidence and offers theoretical underpinnings for BPM, the determinants of BPM and the influence of BPM on SCA. As such, it can be concluded that this study has achieved its objectives and addressed the problem statement.

5.5 Research & Methodological Implications

This study has numerous research and methodological implications. One of the main research implications is empirical testing of the research model and providing evidence to support the notion as proposed by Trkman (2010). In his study, he conducted case studies to justify that dynamic capabilities theory, contingency theory and task-technology fit theory can be analysed in a single framework. This study extends the knowledge on BPM and SCA by providing empirical evidence that these theories can be combined.

This study provides empirical evidence that BPM has the potential to create SCA, as articulated by Gowen & Tallon (2005), Hung (2006) and Trkman (2010). Past researches conducted by McCormack (2001), Lok et al. (2005), Hung (2006) and Skrinjar et al. examined the influence of BPM on organisational performance. This study extends the perspective of BPM and provides empirical evidence to support its

relationship with SCA. This implies that BPM has the potential to provide organisations with short term as well as long term returns.

This study examines BPM within the context of BPO and PII. Prior studies by McCormack (2001) and Skrinjar et al. (2008) viewed BPM as BPO. Hung (2006) examined BPM in the context of process alignment and people involvement while Lok et al. (2005) on the other hand viewed BPM within the context of PII. This study combined the view of BPO and PII to form a holistic view of BPM as mentioned by Lee & Dale (1998) and Zairi (1997). The reason to combine BPO and PII when analysing BPM is because, it is believed that BPM should cover both aspects of process management as well as process improvements.

From this study, it was revealed the variables governed by contingency theory, namely structural alignment and strategic alignment has positive relationship with BPM. In addition, BPM is able to create greater value on SCA when influenced by structural alignment and strategic alignment. This finding reveal that any changes on contingency theory especially on structural alignment and strategic alignment can have an impact on BPM which indirectly cause an impact on SCA.

Similarly, task-technology fit theory influences dynamic capability theory. Although this study failed to observe any significant influence of IT capability on BPM, nevertheless positive influence of IT investment on the relationship between BPM and SCA was observed. This implies that any future studies on IT investment would require examination of BPM as well.

This study provided evidence that process flexibility, BPM and SCA are variables under dynamic capability theory and have positive relationship among each other. Process flexibility positively influences BPM and BPM positively influences SCA. The study also revealed that BPM mediates the relationship between process flexibility and SCA. As such the knowledge of dynamic capability theory is enhanced to include process flexibility as well as BPM.

A methodological implication from this study is the development of a common measurement instrument for process flexibility that could be applied to both manufacturing and services industries. Past research by Nidomolu & Knotts (1998) empirically examined process flexibility for the manufacturing industry only. With the development of a common measurement instrument, future researchers can conduct studies covering both industries simultaneously. From this study, it is proven that although the manufacturing and services industry differ in terms of work approach and performance, nevertheless the element of process flexibility is common and can be analysed together.

This study employed the use of FGD in developing the measurement instrument for process flexibility. This provides future researches with knowledge on ways to incorporate qualitative study in a quantitative research framework. The approach to conduct FGD provides guidance for future researches to include variables with no suitable measurement instrument into their research framework. As such this study includes suggestions on ways to effectively conduct FGD.

This study applied SEM to conduct assessment on the research model and the mediating and moderating effects in the model. This approach is more relevant and accurate in simultaneously examining multiple relationships. Past studies on BPM mostly applied regression analysis and SEM. Although regression analysis can also be applied to test the hypotheses, SEM is a quicker and more efficient in testing the hypotheses.

Last but not least, this study also incorporated interview sessions as part of the research methodology. The purpose of the interview sessions were to delve deeper to determine the reason for failing to observe significant relationship between IT capability and BPM. Interview sessions are effective in trying to understand root cause and highlight potential variables that may not have been included in the study. In addition to relying on literature to explain the unsupported result of the hypothesis testing, findings from the interview sessions can be used to explain the results. The findings from the interview sessions may be more relevant and up-to-date. This provides an excellent avenue for future researches in conducting further studies as well. In this study, it was surfaced that top management capability and innovation can be included as potential variables in enhancing the research model.

5.6 Practical Implications

Apart from research and methodological implications, this study also has practical implications. The main implication derived from this study is the influence of BPM on SCA. This provides practitioners with insight that BPM not only serves as a blueprint to ensure operational efficiency and effectiveness, it can also create a

distinctive competency that may be difficult for competitors to duplicate. As such, any time, money or effort put into improving BPM is beneficial in staying ahead of competition.

The elements of BPM cover both process management as well as process improvements. It is crucial for practitioners to understand that the concept of BPM is not static rather very dynamic in nature. If practitioners desire to create distinctive competency out of BPM, efforts must be put in place to ensure BPM practices within the organisations stay relevant to the internal and external environmental conditions. This would require that processes are documented, process performance are measured and reported for the purpose of continuous improvement. Improvement efforts also need to be incorporated in the organisational culture as without continuous improvement, any organisation is faced with the risk of falling behind their competition.

This study also reveals that process flexibility allows greater performance on BPM. This implies that the foundation in which processes are managed and improved needs to be flexibility to accommodate for deviations while not compromising shared objectives. A flexible structure allows deviations to be accommodated within a short time, hence creating the ability to address customer demands quickly.

In addition to that, this study provides evidence that any investments to IT applications used for BPM do have the potential to heighten competitive advantage. This would aid practitioners in justifying the need to automate BPM or adopting workflow to improve their efficiency. It is to be noted that IT investment would prove to be of greater value when applying to processes that are running smoothly and efficiently.

The organisational structure implemented in the organisation has an influence over the performance of BPM and SCA too. As such, practitioners should pay careful attention when selecting and adopting a structure that best represent the organisation as well as the industry. It is important to note that cross-functional communications across departments are important in ensuring the effectiveness of BPM.

From a strategic point of view, this study reveals that BPM not only binds all operational activities together, it is also the link between the strategic level and the operational level in an organisation. It is imperative that management in organisations spend time to understand their BPM and incorporate BPM performance into management oversight and strategic planning. When this is done properly, BPM can maximise value to the organisation by creating SCA.

Although this study failed to observe significant relationship between IT capability and BPM, the opinions from the interviewees provide valuable insight to practitioners for due consideration. It would benefit organisations to have within their management oversight the effectiveness of IT capability to their BPM activities. This would provide lessons learnt on the issues faced with IT capability. Another aspect worth consideration is to include IT capability activities in their strategic objectives. This would indirectly ensure that IT capability and BPM are monitored at the top management. Another important aspect to be considered by practitioners is the skills of their employees – both at top management level as well as the operational level in determining the requirements of IT capability, delivering the IT capability and monitoring the effectiveness of IT capability.

5.7 Limitations and Suggestions for Future Research

The scope of this study was confined to organisations in Malaysia as listed in the Malaysia 1000 Directory published by BASIS Publications Sdn Bhd. Future research is recommended on other countries and subsequently cross country examinations can be performed to identify similarities and differences.

In addition, the determinants of BPM were confined to structural alignment, strategic alignment, IT capability and process flexibility. This was because adequate gaps in literature was identified for the above four variables. However, in the course of the study innovation, employee involvement, top management commitment, innovation and organisational culture surfaced as potential areas to be examined in relation to BPM and SCA. As such, future research may consider adding these variables. In addition, this study combined dynamic capabilities theory, task-technology fit theory and contingency theory. This was based on the novel idea of Trkman (2010). Future researches may consider examining BPM in the perspective of other contemporary theories as such the possibility of including more variables.

The measurement scales for SCA can be expanded to encompass a wider spectrum of market conditions and the organisation's responsiveness towards the dynamic and volatile external environment. The current measurement instrument covers the ability of organisations to deliver rare and valuable competencies that are difficult to duplicate or substitute with other competencies. This angle examines the internal capability of the organisation. It will be holistic to view SCA of organisations in the perspective of dynamism to respond to external conditions.

This study covered both manufacturing and services industries. Future research is suggested to examine both manufacturing and services industries separately to determine if the nature of managing processes and creating SCA is similar or different between manufacturing and services industries. In addition, it would be worthy to examine whether the size of the organisation matters in terms of the practice of BPM and SCA.

Last but not least, it would be beneficial to examine the level of BPM maturity and determine whether the level of maturity has greater effects on SCA. While this study looked at BPM in terms of BPO and PII, it is noted that organisations do practice BPM at various degrees. Similar study was conducted by Bucher & Winter (2009) on level of practice of BPM. It would be interesting to investigate whether the level of practice of BPM produces differing results in terms of SCA. This would entice practitioners to persevere through the implementation of BPM.

5.8 Conclusion

The novel idea of combining dynamic capabilities theory, contingency theory and task-technology fit theory into a single model was empirically tested and proved relevant in the Malaysian business context. This study examined the relationship between BPM and SCA. In addition, this study also revealed that BPM mediates the relationship between structural alignment, strategic alignment and process flexibility to SCA. Finally, this study determined that IT investment moderates the relationship between BPM and SCA.

The above mentioned findings were reached through qualitative and quantitative research methods. 1000 organisations in Malaysia were the target for this study and 248 returned responses aided in the data analysis and findings. In addition to that, interview sessions were conducted to delve deeper to understand the relationship between IT capability and BPM.

The study revealed that it is important for organisations to capitalise on building distinctive competencies from their BPM as BPM is capable of increasing organisations SCA. This is important for organisations today who wish to stay ahead of this competition. Furthermore, structure, strategy and a flexible process structure helps BPM initiatives to be more effective, thus creating competitive advantage. Once BPM initiatives have reached satisfactory levels of performance, it would be worthy to investment in IT to increase BPM's efficiency through workflow and automation.

With the right blend of structure, strategy, IT investment and process flexibility on BPM; organisations have the potential to build competitive advantage that is unique and difficult for competitors to duplicate. Therefore, it would increase the chances of organisations to win larger market shares compared to their rivals.

Although this study failed to observe significant relationship between IT capability and BPM, it is necessary for practitioners to link IT capability initiatives to BPM initiatives. Sources from literature and insights from practitioners indicate that leadership requires a blend of business and IT skills in order to ensure IT capabilities deployed enhance the effectiveness of BPM. In addition, the business skills of IT employees need to be improved such that the IT employees understand the impact of IT capability on business outcomes.

There are many more aspects that can be included in this model. Innovation is an element that has the potential to accelerate improvements. Thus far, this study examines improvements within the context of IT capability, IT investment and PII. However, innovation can explore both technical and non-technical aspects of the organisations as suggested by Weerawardena & O’Cass (2004). Another organisational aspect worthy to be explored further is the influence of organisational culture of BPM. Since BPM is the heart of operational activities, there may be potential link between BPM and organisational culture. The aspect of SCA can also be enhanced to include various dimensions covering internal and external environments that affect an organisation. Further researches are encouraged to be carried out on BPM to enhance the current body of knowledge and building theoretical knowledge around this area.

Finally, this study reached its conclusion by providing answers to the research questions and problem statement. BPM indeed is an integral component of any organisation. Proper management and in-depth understanding of BPM and its relationships with other organisational factors aid in increasing organisational performance. BPM is not just another management fad, it is proven to create value in terms of organisational performance as well as fostering sustainable competitive advantage.

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APPENDIX

Appendix 1: Verbatim for Focus Group Discussion (FGD)

- 1 Devika:
2 My first question is what are the key elements associated with process flexibility?
3 Zulkifli:
4 At Proton, we tailor process according to requirements.
5 We start from blank paper from design stage.
6 We need to carefully think through from the beginning till the end stage.
7 Because it cost us RM1billion to produce one car from start to finish.
8 We need to plan carefully in terms of equipment and design.
9 From design we think of how to utilize current equipments etc.
10 Compared to MNC, all procedures are there and just left to enforce.
11 But we need to go through improvements in our process but it takes time.
12 Our process are constantly evolving.
13 Shuty:
14 I think there is a need to strike a balance.
15 For us, policies are given and there is room for us to manoeuvre on how suitable to
16 implement.
17 Exemptions are allowed whereby we still need to look at the threshold.
18 However we are still within the control environment but can run locally.
19 We face difficulty against going beyond boundaries.
20 There is calculated risk and control in place.
21 Lee Suan Li:

22 Ours is similar with CSC.

23 We have guidance from HQ.

24 Since Nestle is food manufacturing, we are very much concerned with safety and
25 compliance.

26 So I can say that our processes are rigid when looking at safety aspects.

27 For other processes, so long as within the guidelines set, we do allow some flexibility.

28 It also depends on the environment but ultimately we must all comply with safety.

29 Innovation is allowed and there are defined steps to take.

30 Overall, I can say we are not flexible.

31 We do however allow creativity to how the steps are followed example our approach to
32 customers, introducing the product and business management but definitely not
33 production.

34 Kumar:

35 Well, what I can say is that at a macro level, yes the processes are rigid for PMO
36 because we must adopt the practices and methodology.

37 But at the micro level, we allow flexibility to be more customer centric and in facing the
38 actual environment.

39 Adapting to changes are allowed and depends on integrity too.

40 Flexibility is not allowed when going through large steps but micro steps can be
41 adapted.

42 In the middle of projects, we must allow some levels of adaptation.

43 Which without we may not meet our customer requirements.

44 In software development for the last 10 years were inflexible.

45 But now developing software is made modular and flexible.

46 Flexibility is built in

47 Example is what we call service oriented architecture.

48 There is flexibility in terms of business rules.

49 Processes need to allow flexibility.

50 Otherwise, it will be like the past whereby system becomes outdated because not able to

51 include changes from economy and business requirements.

52 This is why the inclusion of Business Process Management.

53 Azlinda:

54 As far as process flexibility is concerned, the software development life cycle process is

55 governed by its own methodology and follows industry best practice.

56 The steps start from planning, analysis, design, development, testing and

57 implementation of the system.

58 On the high level, I agree with Kumar that it seems rigid.

59 But the lower levels can be flexible.

60 Nasrul:

61 I am from accounting background.

62 For us, process flexibility is rigid because we are bound by Bursa, International

63 Accounting Standards, Inland revenue, etc.

64 The question is really what is the tolerable level?

65 Sometimes we need to be prudent while other times can be creative ... good example is

66 iPad.

67 So in my profession, no, pretty much.

68 We adopt SAP best practices which has everything in place.

69 But the accounting system controls all.

70 Dr.Sharifah:

71 I think I have one question.

72 Is process flexibility equivalent to innovation?

73 What do you think?

74 Zulkifli:
75 Maybe yes.
76 For Proton is all about delivering results.
77 That's the most important.
78 How to get it done better, that's the mission.
79 How to get things done better and faster.
80 Kumar:
81 So you are saying process flexibility is in the form of innovation in a way.
82 In terms of the objective being to improve the efficiency.
83 Zulkifli:
84 For example, to have meetings with vendors or suppliers to absorb the changes to get
85 better, faster.
86 At a lower cost.
87 The main item is that we have to get the results.
88 The results must be delivered.
89 That is the point.
90 The process information has to change very rapidly.
91 There is no ... the guideline is there.
92 But how to deliver needs to be faster, cheaper and better.
93 Dr.Sharifah:
94 I mean, yes, I agree with you.
95 The specifications are there.
96 But how it is being approached?
97 So to what extend flexibility are allowed in your organization?
98 Shuty:
99 I think is more of change of the processes than innovation, new invention.

100 Look back at the level of change in the processes.

101 That is remains flexible to the processes.

102 I don't think they can be different at all.

103 Whether is flexibility or otherwise there is a change in the process.

104 You look for the results, to know if you have to improve your processes.

105 When you improve your processes, doesn't mean that you are out of compliance.

106 In that sense, it may not be equivalent that flexibility is innovation.

107 Kumar:

108 Okay, so you are saying that allowance for process flexibility is for one aspect to allow

109 for innovation?

110 Which process improvement is a form of innovation.

111 The objective maybe to lower the cost or faster way of doing things or maybe there is a

112 new thinking that relooks at the whole process.

113 So that constant allowance is there.

114 Shuty:

115 I don't know coz the definition looks like flexibility looks like deviating from your core.

116 So in that sense you may actually have certain events where you are out of control

117 where you are not complying to what is required.

118 I may have the innovation to change to improve the processes yet still complying to

119 what is required.

120 Kumar:

121 So at the macro level, the objective is fixed.

122 You don't change.

123 Is only at the micro level, you say the macro level objective is innovation.

124 The objective for that is fixed.

125 At the micro level the thing is to reduce cost.

126 That's that, you cant change.

127 You are governed by within those paradigms.

128 So the macro level, the higher level is really not flexible.

129 You cant change the process.

130 You cant change the larger process.

131 Lets do it this way, you are not allowed to do that.

132 There is proven methodologies and generally accepted practices.

133 Unless there is a major revolution, which is very rare.

134 Zulkifli:

135 We have lots of processes.

136 Design, testing, procurement for suppliers.

137 We have to follow the best practice.

138 In order to control the results and the data need to be real-time.

139 We improve our system to the SAP system so that the results are online.

140 We follow other best practices and governed by SOPs.

141 Dr.Sharifah:

142 SOP limits the flexibility.

143 Azlinda:

144 Processes I think are created in an effort to achieve a certain level of quality.

145 That is required in your industry.

146 By not having flexibility, it would mean that you cannot think of better ways or you

147 cannot innovate, sought of.

148 But having too much flexibility I think would also not be advisable coz there will be

149 chaos.

150 Everybody will be doing whatever that they like to do and not following the process.

151 Azlinda:

152 But I think there needs to be a balance.

153 You can be a flexible person but to ensure focus on shared objectives.

154 Kumar:

155 They all think like in software engineering aspect.

156 When we deliver a solution or a product, we follow very rigid process.

157 But the solution in which we deliver to the customer has to be very flexible.

158 This is where the SOA and business process management comes, you see.

159 In those days the transaction rules are together.

160 Now, we have broken it up separately to allow flexibility in rules and process.

161 And it is very easy now.

162 In those days, we had to overhaul the whole thing and is though.

163 We are governed by process but we deliver solutions that are flexible.

164 ICT industry for that matter, the product has to be flexible.

165 In the software we actually flow the processes but is designed to be flexible.

166 Azlinda:

167 If its not, it gets obsolete.

168 Kumar:

169 Yes, to avoid obsolete.

170 Lee Suan Li:

171 In the food industry we look at process flexibility more for improvement purposes.

172 And process flexibility is in the way that we move forward.

173 We don't go back to the old ways.

174 There is no two ways on doing things in a process.

175 There is no way in a process to do it this way or the other way.

176 Usually in a process, it is carried through to the end.

177 Kumar:

178 So it's a one time event?

179 Lee Suan Li:

180 Yea is a one time event where in moving forward improving either through

181 transformation or by improving the processes through lessons learnt.

182 Kumar:

183 So that becomes lessons learnt so you revise the processes for future, then everybody

184 follow the new process until another event triggers innovation or lessons learnt for

185 process is improvement.

186 You are still governed by process.

187 Lee Suan Li:

188 All in all, we cant move away from process.

189 Devika:

190 If its okay to summarise.

191 I think what we can understand is from all different industries and companies,

192 everybody is faced with the constraints of, their rigid with the requirements of the

193 stakeholder.

194 Whether is government policy or whether is regulation or whether is methodology.

195 Everyone is limited by their own stakeholder needs.

196 But at the same time they are allowed a certain level of flexibility where customers are

197 concerned.

198 You can to an extend change or you can to an extend improve if that is what your

199 customer expects from you.

200 Shuty:

201 Is the end results.

202 Flexibility is there so long the end results and specifications are met.

203 Besides, the business requirements to a certain extend or even to a large extend
204 depending on the technology helps with flexibility.

205 Dr.Sharifah:

206 Can I say that looking back, what is the end product?

207 Is it a product or is it a serviced product?

208 If it's a services product for ICT is more of a serviced product.

209 Maybe the flexibility is needed and greater.

210 But maybe for other specific products maybe its not that much needed because of SOP.

211 Unless maybe in the SOP itself they want to improve.

212 Then if something happens they allow to change.

213 Kumar:

214 I guess if you are manufacturing, is more internal, operational.

215 You are not dynamic towards the customer because you have millions of customers.

216 So yours is more internal focused.

217 Whereas for ICT, is ... well if you are Microsoft they are manufacturing side.

218 Because they are Boolean software developers.

219 So they are more or less manufacturing, they don't do customization for customers.

220 Like for us, we are more of SI, systems integrators company.

221 We are very specific to individual customers.

222 At the end part, we allow process flexibility.

223 To the person facing the customer basically to meet the needs, reduce the cost.

224 But at the macro, we still follow the best practice.

225 Dr.Sharifah:

226 If we focus on Proton, lets say, when it comes to the manufacturing of cars we cant be

227 flexible.

228 You cant.

229 But what about in terms of the creativity side?

230 What about in terms of the designing?

231 I think that is where flexibility is very much more applied, right?

232 Zulkifli:

233 For production, we have to follow very strict processes, SOPs, you know.

234 But that's on production processes.

235 But in terms of development, when we talk about our previous model.

236 We need creativity.

237 Now cars are developed from 3 years to 18 months.

238 We look at speed of delivery.

239 We have to look for suitable partners.

240 Look more from overseas.

241 Kumar:

242 So what you are saying that in terms of producing a car is more fixed.

243 In sales and marketing, from a cycle of lets say 3 years you change you product now to

244 reduce to reach market in 18 months.

245 So if last time the process to develop every 3 years now is look at every 18 months.

246 I wanted to ask you does manufacturing allow looking at brakes first before engines?

247 Or something like that?

248 Do they allow?

249 Zulkifli:

250 Okay, there are stations and we have a conveyer belt type, is very specific.

251 Kumar:

252 Regardless if the brake guy as ample time?

253 Zulkifli:

254 Yes, because they need to go through the proper station.

255 Kumar:
256 They still follow the process.
257 Even though some stations are very free.
258 Even the development of 10 components, one cant start the development even though
259 they are free.
260 Because the other components are not ready.
261 Ok so they all follow like that.
262 Devika:
263 But En.Zul had a very interesting point that besides the customers, they actually need to
264 go to market faster that means the delivery time is also one aspect that drives you to be
265 flexible.
266 Zulkifli:
267 Overall delivery time actually.
268 And cost as well.
269 We are really handicapped when compared to Honda and Toyota.
270 Their one model can produce half million per year.
271 In our case is longer, the technical design takes one year even 2 years.
272 The designers are actually artist.
273 They are of engineering background but can draw.
274 Devika:
275 Now, I would actually like to ask something related to the future.
276 How would you like to see process flexibility in your organization in the near future?
277 Zulkifli:
278 First I think we need to instill basic things right first.
279 So that can get information much faster.
280 But need to put the basic things right first.

281 The must have flexibility in mind so that whatever they do is right from start.
282 Number two, again we have to make sure the processes within our control.
283 We must have all information in one place.
284 That's why we have to go for the computerization and data acquisition all in place.
285 For example the process of planning, procurement of components to the production
286 planning.
287 Which model come first, okay, up to sales and services.
288 Because the current changes are happening so fast.
289 Unimaginable.
290 For example I give the latest case with us was on Inspira.
291 Our market survey says 70% will buy empty.
292 30% will buy with full.
293 But when the car launched, it happened the other way round.
294 More people wanted automatic.
295 So again we had to ask Mitsubishi for support.
296 Kumar:
297 So you have to plan your processes extensively.
298 Zulkifli:
299 Because when you produce a car, you have to sell it immediately to the customer.
300 If you store in on place, it will deteriorate and cost money for you
301 For one car for example you spend 50 thousand.
302 You need the money for rolling.
303 So its actually at the beginning of the process everything must be captured real time in
304 one place.
305 So that we can respond to the customer needs and make decision in a proper way.
306 Dr.Sharifah:

307 Meaning that the decision can be reversible.

308 Zulkifli:

309 Yes.

310 Kumar:

311 I would say generally processes are developed based a norm.

312 The current norm.

313 But I still believe that you should allow the processes to have flexibility to cater for new

314 norms.

315 Like suddenly when you launched, there is a new norm.

316 It was unexpected.

317 So the original design of any process must allow changes for the processes to be

318 immediately effected.

319 On short notice. Not go through a long period.

320 In that way, all processes should have some sort of degree of flexibility built in that they

321 can cater for new norms.

322 Even if you talk about different best practices or methodology all that, they are based on

323 norms that are average.

324 Generally accepted norms.

325 And the sampling will be very very large, based on different countries, different

326 standards.

327 But if you are talking about, I would say, for example Proton.

328 You would not of an apple to apple comparison with Toyota.

329 Because its an older company with much more established manufacturing practice, all

330 that.

331 And Proton is still very much a young company.

332 So the norms are different.

333 Right, so I would say, we adopt best practices.

334 They are based on a wide average.

335 But the processes must allow for change.

336 There must be in-built flexibility.

337 So you are quick enough, agile enough to cater to your business needs.

338 In my case, project needs and it is very dynamic.

339 A new regulation may appear or suddenly, like for us in public sector projects

340 Its real actually, Tan Sri Sidek my actually create something and it goes down very fast.

341 And we have to adapt.

342 We don't have like weeks to think about it.

343 Usually we have a matter of within a week.

344 5 days.

345 We have to come up with the whole change and adapt the processes within

346 Know on Monday and by Friday to firm up.

347 That's how fast we have to do.

348 But the key to that is the original processes need to have flexibility to allow for this.

349 That generally, I think, moving forward that needs to be in in most industries.

350 Devika:

351 That means Kumar, the flexibility there is that there is an allowance for exemptions.

352 So that you can actually go and modify whatever that needs to be done.

353 Kumar:

354 Within the guidelines of making changes.

355 You can have process flexibility but there is a guideline of how you conduct it.

356 You do not go and put it in an active production, live environment.

357 You actually have to test it, proven, verified, yes its adaptable.

358 You know, you have looked at all different aspects of it.

359 It cannot be a process that's so fixed that the dependencies are wide spread then you
360 cant make a change over a period of a week.
361 You know, it might take a year to make a change.
362 There are some organization processes that you cant make a change because the
363 dependencies in the processes are wide spread.
364 So what you do is, what most organizations do is they break down the processes to be
365 more dynamic.
366 Then if you really break down the processes, some are fixed, some are flexible, so that's
367 how we reengineer the whole thing.
368 In actual process, even in the solutions we deliver.
369 So, that allows dynamism.
370 So we are relooking at it to allow process flexibility.
371 In fact, in the Government in some of the projects that I am doing, it also does that.
372 They actually have been looking at it.
373 Shuty:
374 There is always the importance of being first in the market.
375 Objective is to make money. Definitely.
376 Making money.
377 Eventually, looking at processes the main thing would be more of the key controls.
378 Key controls in certain times, more actually are inflexible.
379 It is still processes but more often the key controls makes some processes rigid to a
380 certain extend.
381 But the key controls is there in making sure that eventually the objectives are achieved.
382 It is more of calculated risks which is important to prevent by having controls in place.
383 I look at it more of the processes in the sense of controls.

384 Eventually controls are there to make sure objectives are achieved but other than that
385 you may have the flexibility.

386 Kumar:

387 So the controls are there in serving a purpose.

388 Shuty:

389 Yes.

390 Dr.Sharifah:

391 Should that be encouraged?

392 Shuty:

393 That should be encouraged, yes.

394 But I would say that whoever owned the company would want to have the controls to
395 make sure that eventually they achieve the key objectives altogether.

396 Lee Suan Li:

397 Basically, process flexibility is also linked to the severity of the issue at the end of it.

398 If the issue is very severe then there is a need to change.

399 To allow it to be better again.

400 To minimize the severity and flexibility would come in in that sense.

401 In certain areas, is always going back to the process once you have tackled the issue and
402 minimized the severity.

403 Still the whole process will come back to sort of post mortem to see what actually
404 happened.

405 Look at the whole event to see what actually gave rise to the severity in itself.

406 Kumar:

407 Again your original or core processes must allow for that.

408 If it doesn't allow for change, you loose market and don't meet your objectives.

409 Azlinda:

410 At the end of the day, in the service industry, the ultimate objective is to continuously
411 improve you service delivery for your customers.
412 They cannot be too rigid.
413 You have to have flexibility.
414 Kumar:
415 I think everybody now is in the service industry anyway.
416 The new law.
417 Even the Government is a service industry.
418 People, the current theme is service, service, service.
419 Shuty:
420 I think when we look at processes whether flexible or not, it also boils down to the
421 people.
422 People that execute the process.
423 The process may be flexible but during execution to what direction.
424 Is the people that determine to what direction.
425 Kumar:
426 So sometimes technology innovation, people attitudes needs to be changed that helps.
427 Attitude also refers to willing to work even be creative, you know, innovation.
428 You allow people to give ideas.
429 You see, in some organizations you don't allow people to give ideas.
430 Kumar:
431 We should allow for process flexibility for innovation, for betterment.
432 Dr.Sharifah:
433 But flexibility within the boundaries?
434 Kumar:
435 Yes.

436 Dr.Sharifah:
437 If you allow flexibility, again you must think about the time and the cost.
438 So that is why I say within the boundaries.
439 Otherwise, where is the boundaries?
440 Kumar:
441 Yes, the boundaries still need to be there.
442 Shuty:
443 I suppose the boundaries acting within objectives, shared objectives.
444 Kumar:
445 Yes, I suppose within quality control and quality assurance.
446 It depends on how you detect a thing.
447 Maybe you might want to allow change.
448 But the fact that you still have to do that check but what you might find a different
449 innovative way to do that.
450 Zulkifli:
451 Last time we used to refer to Japan for innovation but now we are looking at South
452 Korea.
453 Very creative people too.
454 Actually when I say South Korea, I think is because they are always in war.
455 The environment, for hundred years.
456 Even now.
457 Kumar:
458 So that triggered innovation.
459 Zulkifli:
460 Yes, they have to be innovative for survival.
461 That's why.

462 The car quality now is not Toyota, is Hyundai.

463 South Korea car compression is not very, how you say it.

464 But they have to be very very innovative for survival.

Appendix 2: Data Analysis and Key Themes for Process Flexibility

Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6
What are the key elements associated with process flexibility? How is process flexibility practiced in your organization & daily operations?					
<p>At a macro level, the processes are rigid for PMO because we must adopt the practices and methodology. But at the micro level, we allow flexibility to be more customer centric and in facing the actual environment. <u>Adapting to changes</u> is allowed and depends on integrity too. In the middle of projects, we must allow some levels of adaptation otherwise we may not meet our customer requirements. In software development was inflexible for the</p>	<p>I am from accounting background. For us, process flexibility is rigid because we are bound by Bursa, International Accounting Standards, Inland revenue, etc. The question is really what is the tolerable level? Sometimes we need to be prudent while other times can be <u>creative</u>. So in my profession, no. We adopt SAP best practices which has everything in place. But the accounting system controls all.</p>	<p>Ours is similar with Panel 4's firm. We have guidance from HQ. We are very much concerned with safety and compliance. Our processes are rigid when looking at safety aspects. For other processes, so long as within the guidelines set, we do allow some flexibility. It also depends on the environment but ultimately we must all comply with safety. Innovation is allowed and there are defined steps to take. Overall, we are not flexible. We do however allow <u>creativity</u> as to how the steps are followed example our approach to customers, introducing the product and business management but definitely</p>	<p>I think there is a need to strike a balance. For us, policies are given and there is room for us to manoeuvre on how suitable to implement. <u>Exemptions are allowed</u> whereby we still need to look at the threshold. However we are still <u>within the control environment</u> but can run locally. We face difficulty against going beyond boundaries. There is calculated risk and control in place.</p>	<p>At my firm, we tailor process according to requirements. We start from blank paper from design stage. We need to carefully think through from the beginning till the end. Because it cost us RM1billion to produce one product from start to finish. We need to plan carefully in terms of equipment and design. From design we think of how to utilize current equipments etc. Compared to MNCs, all procedures are there and just left to enforce. But we need to go through <u>improvements</u> in our process but it takes time. Our processes are</p>	<p>As far as process flexibility is concerned, the software development life cycle process is governed by its own methodology and follows industry best practice. The steps start from planning, analysis, design, development, testing and implementation of the system. On the high level, it seems rigid. But the lower levels can be flexible.</p>

Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6
<p>last 10 years. But now developing software is made modular and flexible. There is flexibility in terms of business rules. Processes need to allow flexibility. Otherwise, it will become outdated because not able to include changes from economy and business requirements.</p>		<p>not in production.</p>		<p>constantly evolving.</p>	
<p>Is process flexibility equivalent to innovation?</p>					
<p>So Panel 5 is saying process flexibility is in the form of innovation in a way. In terms of the objective being to improve the efficiency. But Panel 4 is saying that process improvement is a form of innovation. The</p>		<p>In the food industry we look at process flexibility more for <u>improvement</u> purposes. Process flexibility is in the way that we move forward. We don't go back to the old ways. There is no two ways on doing things in a process. Usually in a process, it is carried through to the end. It is a one time event where in moving forward improving</p>	<p>More of change of the processes than innovation. Look back at the level of change in the processes. Whether is flexibility or otherwise there is a change in the process. You look for the results, to know if you have to improve processes. When you</p>	<p>Maybe yes. For my firm is all about <u>delivering results</u>. That's the most important. How to get it done better, that's the mission. <u>How to get things done better and faster</u>. For example, to have meetings with vendors or suppliers to <u>absorb the changes</u> to get better, faster. At a lower</p>	<p>Processes are created in an effort to achieve a certain level of quality that is required in your industry. By not having flexibility, it would mean that you cannot think of better ways or you cannot innovate. But having too much flexibility I think would also not be advisable coz there will be chaos. Everybody will be</p>

Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6
<p>objective maybe to lower the cost or faster way of doing things or maybe there is a new thinking that relooks at the whole process. So that constant allowance is there.</p> <p>So at the macro level, the objective is fixed. Is only at the micro level. You are governed by within those paradigms. There is proven methodologies and generally accepted practices. Unless there is a major revolution, which is very rare.</p> <p>In the software industry, we look at flexibility so that it does not get obsolete.</p>		<p>either through transformation or by improving the processes through lessons learnt. So that becomes lessons learnt so you revise the processes for future, then everybody follow the new process until another event triggers innovation or lessons learnt for process improvement.</p>	<p>improve processes, doesn't mean that you are out of compliance.</p> <p>Flexibility looks like deviating from your core. You may have certain events where you are out of control where you are not complying to what is required. I may have the innovation to change to improve the processes yet still complying to what is required. Flexibility is there so long the <u>end results and specs are met</u>. To a large extend depending on the <u>technology helps with flexibility</u>.</p>	<p>cost. The main item is that we have to get the results. The results must be delivered. The <u>process information</u> has to change very rapidly. How to deliver needs to be faster, cheaper and better.</p> <p>We have lots of processes. We have to follow the best practice. In order to control the results the data need to be real-time. We improve our system to the SAP system so that the results are online. We follow other best practices and governed by SOPs</p>	<p>doing whatever that they like to do and not following the process. I think there needs to be a balance. You can be a flexible person but to ensure focus on <u>shared objectives</u>.</p>

Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6
<p>Looking back, what is the end product? Is it a product or is it a serviced product? If it's a services product for ICT is more of a serviced product, maybe the flexibility is needed and greater. But maybe for other specific products maybe its not that much needed because of SOP. Unless in the SOP itself they want to improve. Then if something happens they allow to change.</p>					
<p>I guess if you are manufacturing, is more internal, operational. You are not dynamic towards the customer because you have millions of customers. So yours is more internal focused. Like for us, we are more of SI, systems integrators company. We are very specific to individual customers. At the end part, we allow process flexibility. To the person facing the customer basically to meet the needs, reduce the cost. But at the macro, we still follow the best practice.</p>				<p>For production, we have to follow very strict processes, the SOPs. But in terms of development, we need creativity. Now cars are developed from 3 years to 18 months. We look at speed of delivery. We have to look for suitable partners, more from overseas. The need to go to market faster that means the delivery time is also one aspect that drives you to be flexible. Overall delivery time and cost as well.</p>	

Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6
<p>Everybody now is in the service industry. The new law. Even the Government is a service industry. The current theme is service, service, service.</p>					
<p>How would you like to see process flexibility in your organization in the near future?</p>					
<p>Generally processes are developed based on a norm. The current norm. But should allow the processes to have flexibility to cater for new norms. So the original design of any process must allow changes for the processes to be immediately effected. In that way, all processes should have some degree of flexibility built in that they can cater for new</p>		<p>Basically, process flexibility is also linked to the severity of the issue at the end of it. If the issue is very severe then there is a <u>need to change</u>. To allow it to be better again. To minimize the severity and flexibility would come in that sense. In certain areas, is always going back to the process once you have tackled the issue and minimized the severity. Still the whole process will come back to sort of post mortem to see what actually happened. Look at the whole event to see what actually</p>	<p>There is always the importance of being first in the market. Objective is to make money. Eventually, looking at processes the main thing would be more of the <u>key controls</u>. Key controls in certain times, more actually are inflexible. It is still processes but more often the key controls makes some processes rigid to a certain extend. But the key controls is there in making sure that</p>	<p>Firstly we need to put the basic things right so that can get <u>information</u> much faster. Must have flexibility in mind so that whatever they do is right from start. Second, to make sure the processes <u>within our control</u>. We must have all information in one place. That's why we have to go for the computerization and data acquisition all in place. Because the current changes are happening so fast. When you produce, you have to sell it</p>	<p>At the end of the day, in the service industry, the ultimate objective is to <u>continuously improve</u> your service delivery for your customers. They cannot be too rigid. You have to have flexibility.</p>

Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6
<p>norms. Even if you talk about different best practices or methodology, they are based on generally accepted norms. But the processes must allow for change. There must be in-built flexibility. So you are quick enough, agile enough to cater to your business needs. In my case, project needs which is very dynamic. We have to come up with the whole change and adapt the processes. But the key to that is the original processes need to have flexibility to allow for this. The flexibility is that there is an <u>allowance for exemptions</u> within the guidelines of making changes. There are organizations processes that you</p>		<p>gave rise to the severity in itself.</p>	<p>eventually the <u>objectives are achieved</u>. It is more of calculated risks which is important to prevent by having controls in place. I look at it more of the processes in the sense of controls. Eventually controls are there to make sure objectives are achieved but other than that you may have the flexibility. That should be encouraged. But I would say that whoever owned the company would want to have the controls to make sure that eventually they achieve the key objectives altogether.</p> <p>When we look at processes whether flexible or not, it also boils down to the</p>	<p>immediately to the customer. If you store in one place, it will deteriorate and cost money for you. So its actually at the beginning of the process everything must be captured real time in one place. So that we can respond to the customer needs and make decision in a proper way. So the controls are there in serving a purpose.</p> <p>Last time we used to refer to Japan for innovation but now we are looking at South Korea. Very creative people too. They have to be innovative for survival.</p>	

Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6
<p>cant make a change because the dependencies in the processes are wide spread. So what they do is break down the processes to be more dynamic. Then some are fixed, some are flexible, so that's how we reengineer the whole thing.</p> <p>Sometimes <u>technology innovation, people attitudes</u> needs to be changed. Attitude also refers to willing to work even be creative. You allow people to give ideas. We should allow for process flexibility for betterment within the boundaries.</p>			<p>people. <u>People</u> that execute the process. The process may be flexible but during execution to what direction. Is the people that determine to what direction.</p> <p>I suppose the <u>boundaries acting within objectives</u>, shared objectives.</p>		

Emerging Themes

Theme	Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6
Controllability while meeting shared objectives	x		x	x	x	x
Adaptability/ Responding to Change	x		x	x	x	x
Continuous Improvement			x	x	x	x
Creative & Innovative	x	x	x		x	
Exception Handling	x			x		

Appendix 3: Survey Instrument

Survey on Business Process Management

You are cordially invited to participate in this survey targeted at top management from established and reputed companies in Malaysia. The purpose of this survey is to solicit views on business processes and other attributes in relation to organisational outcomes such as competitiveness and performance.

Please be rest assured that your identity will remain anonymous and your responses to the survey will be held in strict confidence and used for academic purposes only.

This survey consists of multiple choice questions and should take approximately 15 minutes of your time.

Your feedback is important and will contribute towards enriching the knowledge and understanding of business practices in Malaysia.

Thank you in advance for your contribution.

Yours sincerely,
Devika Nadarajah
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Supervised by,
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Company Background

Description: This section aims at obtaining background information about the organisation, in an effort to understand better on the nature of business of the organisation.

Instructions: Please select the most appropriate response to the following statements about on your organisation:

a. Nature of business of your organisation:

Manufacturing

Services

b. Industry that your organisation operates in:

Accounting

Government

Publishing/Printing

Advertising/Public
Relations/Marketing

Financial
Services

Real Estate

Architecture

Food and
Beverages

Retail

Banking

Healthcare

Staffing

Construction

Insurance

Technology

Consulting

Legal

Telecommunications

Distribution

Non-Profit
Organisation

Transportation

Education

Manufacturing

Others: _____

Engineering

c. Age of your organisation:

- Less than 5 years
- 5 to 10 years
- 10 to 15 years
- 15 to 20 years
- More than 20 years

d. Number of employees in your organisation:

- Less than 100 employees
- 100 to 200 employees
- 200 to 300 employees
- 300 to 400 employees
- 400 to 500 employees
- More than 500 employee

e. Market share:

- Above 75% market share
- 50% to 75% market share
- 25% to 50% market share
- Less than 25% market share

B: Survey Questions

B1: Organisational Alignment

Description: This section aims at obtaining information about the organisation’s alignment in terms of structure and strategy.

Instructions: Please select the most appropriate response to indicate your level of agreement to the following statements:

No	Items	Response				
		Strongly Disagree		Strongly Agree		
		1	2	3	4	5
Structural Alignment						
1.	Cross-functional teams have more authority than departmental managers in making day-today decisions (removed after pilot test).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	The current response time is highly satisfactory to customers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Horizontal communication is well practised within the organisation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	The organisation structure is relatively flat (less hierarchical).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Managerial tasks are delegated to front-line staff.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	There are high communication barriers between departments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


No	Items	Response				
		Strongly Disagree		Strongly Agree		
		—————→				
		1	2	3	4	5
Strategic Alignment						
7.	Strategies are developed based external factors (such as customer needs or competitors' moves).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	The management team has identified core processes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Core processes are important input to strategic planning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Operational improvements have a direct impact on the organisation's ability to compete.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Sufficient measures are in place to track the organisation's performance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Current strategic plan identifies the projects we actually undertake to improve the organisation's business processes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Strategic planning process encourages information sharing and cross-functional cooperation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B2: IT Capability and Investments

Description: This section aims at obtaining information about the organisation’s IT capability and investments.

Instructions: Please select the most appropriate response to indicate your level of agreement to the following statements:

No	Items	Response				
		Strongly Disagree		Strongly Agree		
		1	2	3	4	5
IT Capability						
14.	Technical skills of IT staff in the organisation facilitates new technology investments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	Business skills of IT staff in the organisation facilitates new technology investments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	IT skills of end users in the organisation facilitates new technology investments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	Ability to hire new IT staff in the organisation facilitates new technology investments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	Senior management support for IT projects facilitates new technology investments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	Business units involvements in IT projects facilitates new IT investments.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No	Items	Response				
		Strongly Disagree  Strongly Agree				
		1	2	3	4	5
20.	Communication methods such as email, intranets and wireless devices are important for:					
	a. internal communications within the organisation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b. communications with suppliers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	The organisation has a high degree of digitization in ...					
	a. purchasing process – electronic purchase orders/ total purchase orders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b. sales process – electronic sales/ total sales.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	The organisation has a high degree of Internet technology use to perform:					
	a. sales force management.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b. employee performance management.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	c. employee training.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	d. post-sales customer support.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


Instructions: Please select the most appropriate response to indicate your level of agreement to the following statements:

IT Investment						
23.	Estimated total expenditures on IT (in millions) for the entire organisation (including both internal and outsourced expenditures).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		< RM1 mil	RM 1 – 5 million	RM 6 – 10 million	RM 11 – 15 million	> RM 16 million
24.	Of the organisation wide IT expenditure identified in No. 23, the estimated percentage classified as:					
	a. IT infrastructure is ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		0 – 20%	20 – 40%	40 – 60%	60 – 80%	80 – 100%
	b. investments in IT made to cut operating cost is ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		0 – 20%	20 – 40%	40 – 60%	60 – 80%	80 – 100%
	c. investments in IT to provide internal information is ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		0 – 20%	20 – 40%	40 – 60%	60 – 80%	80 – 100%
	d. investments in IT to increase sales or market share by providing improved customer service or products is ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		0 – 20%	20 – 40%	40 – 60%	60 – 80%	80 – 100%

B3: Business Process Management

Description: This section aims at obtaining information about the organisation's management of business processes in terms of process orientation, improvement initiatives and flexibility.

Instructions: Please select the most appropriate response to indicate your level of agreement to the following statements:

No	Items	Response				
		Strongly Disagree  Strongly Agree				
		1	2	3	4	5
Business Process Orientation (BPO)						
25.	The average employee views the business as a series of linked processes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26.	Process terms such as input, output, process and process owners are used commonly in conversations in the organisation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27.	Processes within the organisation are defined and documented using inputs and outputs to and from our customers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28.	Implementation of information technology is based on the processes, not on functions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29.	Jobs are usually multidimensional and not just simple tasks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30.	Jobs include frequent problem solving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31.	People are constantly learning new things on the job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

32.	Process measurements are clearly defined.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33.	Process performance is measured in the organisation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34.	Resources are allocated based on process.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35.	Specific process performance goals are in place.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Process Improvement Initiatives (PII)						
36.	There is an increase in the number of employees involved in process improvement initiatives in the last three years.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37.	The number of process improvement initiatives has increased annually in the last three years.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38.	The organisation has a formal methodology in place to guide the process improvement initiatives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39.	The organisation will definitely continue with process improvement initiatives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40.	The overall experience with process improvement initiatives has generally been positive.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41.	The process improvement initiatives contribute to bottom line improvement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B4: Process Flexibility

Description: This section aims at obtaining information about the organisation’s process flexibility capabilities.

Instructions: Please select the most appropriate response to indicate your level of agreement to the following statements:

No	Items	Response				
		Strongly Disagree		Strongly Agree		
		1	2	3	4	5
Process Flexibility						
42.	Processes are created or modified while still complying with key controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43.	Processes are created or modified without compromising shared objectives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44.	Processes are designed to detect and respond to changes in the business environment with minimal impact to time, effort, cost or performance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45.	There are mechanisms in place to allow easy modifications to processes for improvements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46.	New processes are developed or existing processes are simplified rapidly and inexpensively to meet market needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47.	Processes are designed to allow temporary deviation from the current norm/ standard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

48. Are there any incidents of deviation from current norm/ standard? Yes No

49. Please elaborate an incident of deviation from current norm/ standard in your organisation
(if any):

50. Was the incident recorded for future reference? Yes No

51. Was it taken into consideration for process improvements? Yes No

B5: Sustainable Competitive Advantage

Description: This section aims at obtaining information about the organisation’s ability to sustain its competitive advantage position.

Instructions: Please select the most appropriate response to indicate your level of agreement to the following statements:

No	Items	Response				
		Strongly Disagree		Strongly Agree		
		1	2	3	4	5
Sustainable Competitive Advantage						
52.	The available resources and capabilities enable effective response to external threats and opportunities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53.	A large part of the organisations internal resources and capabilities are not possessed by competitors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54.	Competitors are likely to face high cost disadvantage to duplicate the organisations programmes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55.	There is vast difference between organisations strategic position and the competitors’ strategic position.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 4: Descriptive Statistics for all Items

Items from Questionnaire	Mean	Standard Deviation
Structural Alignment		
The current response time is highly satisfactory to customers.	3.49	.879
Horizontal communication is well practised within the organisation.	3.57	.824
The organisation structure is relatively flat (less hierarchical).	3.24	1.000
Managerial tasks are delegated to front-line staff.	3.15	.965
There are high communication barriers between departments.	3.02	1.020
Strategic Alignment		
Strategies are developed based external factors (such as customer needs or competitors' moves).	3.70	.937
The management team has identified core processes.	3.67	.855
Core processes are important input to strategic planning.	3.87	.792
Operational improvements have a direct impact on the organisation's ability to compete.	3.89	.821
Sufficient measures are in place to track the organisation's performance.	3.72	.825
Current strategic plan identifies the projects we actually undertake to improve the organisation's business processes.	3.70	.807
Strategic planning process encourages information sharing and cross-functional cooperation.	3.76	.848
IT Capability		
Technical skills of IT staff in the organisation facilitates new technology investments.	3.56	.872

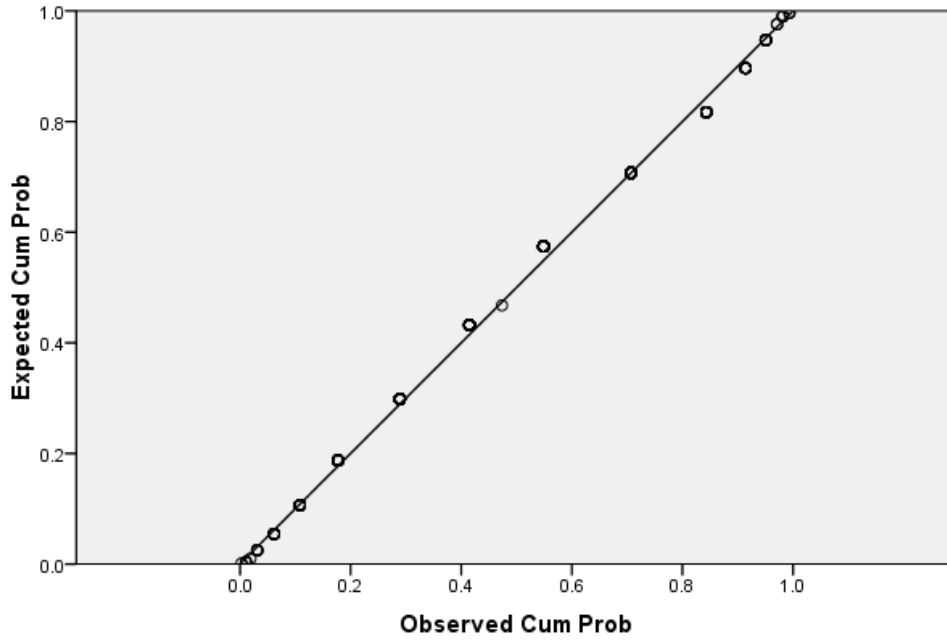
Items from Questionnaire	Mean	Standard Deviation
Business skills of IT staff in the organisation facilitates new technology investments.	3.45	.839
IT skills of end users in the organisation facilitates new technology investments.	3.50	.828
Ability to hire new IT staff in the organisation facilitates new technology investments.	3.36	.853
Senior management support for IT projects facilitates new technology investments.	3.61	.818
Business units involvements in IT projects facilitates new IT investments.	3.61	.743
Communication methods such as email, intranets and wireless devices are important for internal communications within the organisation.	4.09	.917
Communication methods such as email, intranets and wireless devices are important for communications with suppliers.	3.90	.976
The organisation has a high degree of digitization in purchasing process – electronic purchase orders/ total purchase orders.	3.45	.944
The organisation has a high degree of digitization in sales process – electronic sales/ total sales.	3.44	.920
The organisation has a high degree of Internet technology use to perform sales force management.	3.38	.971
The organisation has a high degree of Internet technology use to perform employee performance management.	3.33	.993
The organisation has a high degree of Internet technology use to perform employee training.	3.29	1.006
The organisation has a high degree of Internet technology use to perform post-sales customer support.	3.36	.943
Process Flexibility		
Processes are created or modified while still complying with key controls.	3.53	.862
Processes are created or modified without compromising shared objectives.	3.38	.964

Items from Questionnaire	Mean	Standard Deviation
Processes are designed to detect and respond to changes in the business environment with minimal impact to time, effort, cost or performance.	3.49	.914
There are mechanisms in place to allow easy modifications to processes for improvements.	3.38	.926
New processes are developed or existing processes are simplified rapidly and inexpensively to meet market needs.	3.43	.881
Processes are designed to allow temporary deviation from the current norm/ standard.	3.31	.890
BPM – BPO		
The average employee views the business as a series of linked processes.	3.31	.931
Process terms such as input, output, process and process owners are used commonly in conversations in the organisation.	3.24	.947
Processes within the organisation are defined and documented using inputs and outputs to and from our customers.	3.34	.951
Implementation of information technology is based on the processes, not on functions.	3.29	.877
Jobs are usually multidimensional and not just simple tasks.	3.69	.836
Jobs include frequent problem solving.	3.70	.856
People are constantly learning new things on the job.	3.65	.866
Process measurements are clearly defined.	3.36	.973
Process performance is measured in the organisation.	3.45	.917
Resources are allocated based on process.	3.48	.883
Specific process performance goals are in place.	3.50	.884
BPM – PII		
There is an increase in the number of employees involved in process improvement initiatives in the last three years.	3.42	.911
The number of process improvement initiatives has increased	3.44	.887

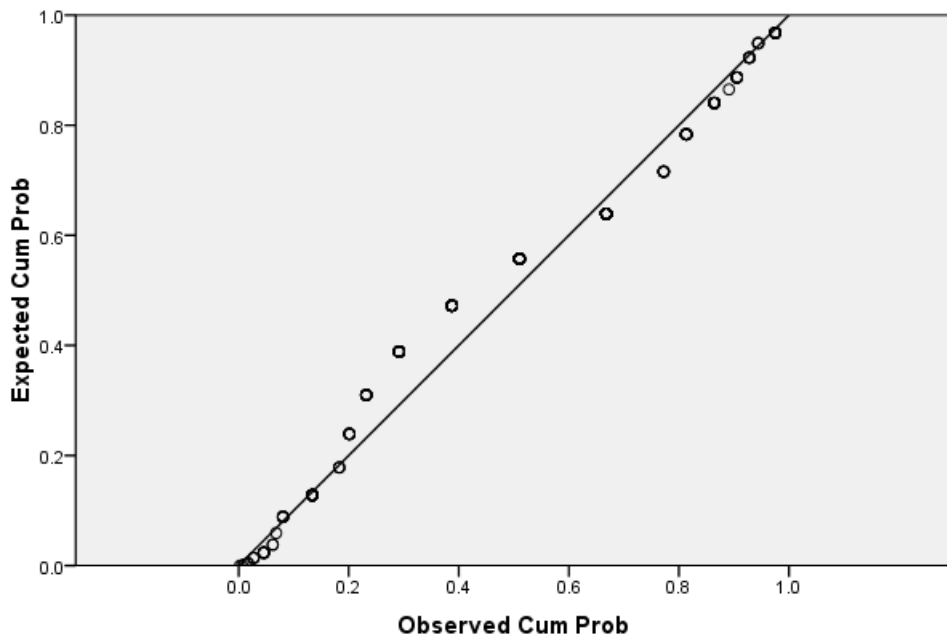
Items from Questionnaire	Mean	Standard Deviation
annually in the last three years.		
The organisation has a formal methodology in place to guide the process improvement initiatives.	3.41	.940
The organisation will definitely continue with process improvement initiatives.	3.66	.898
The overall experience with process improvement initiatives has generally been positive.	3.56	.871
The process improvement initiatives contribute to bottom line improvement.	3.64	.899
IT Investment		
Estimated total expenditures on IT (in millions) for the entire organisation (including both internal and outsourced expenditures).	2.32	1.381
Of the organisation wide IT expenditure identified above, the estimated percentage classified as IT infrastructure is ...	2.27	1.122
Of the organisation wide IT expenditure identified above, the estimated percentage classified as investments in IT made to cut operating cost is ...	2.01	.989
Of the organisation wide IT expenditure identified above, the estimated percentage classified as investments in IT to provide internal information is ...	2.05	1.084
Of the organisation wide IT expenditure identified above, the estimated percentage classified as investments in IT to increase sales or market share by providing improved customer service or products is ...	2.13	1.050
SCA		
The available resources and capabilities enable effective response to external threats and opportunities.	3.48	.828
A large part of the organisations internal resources and capabilities are not possessed by competitors.	3.30	.834
Competitors are likely to face high cost disadvantage to duplicate the organisations programmes.	3.32	.864
There is vast difference between organisations strategic position and the competitors' strategic position.	3.38	.814

Appendix 5: P-Plots for the Seven Variables

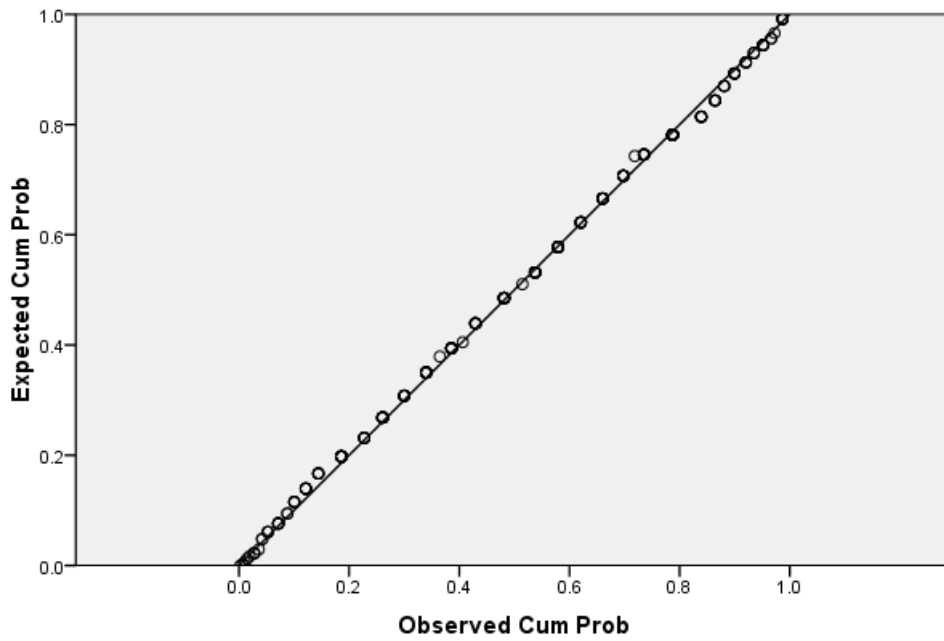
Normal P-P Plot of StructAI



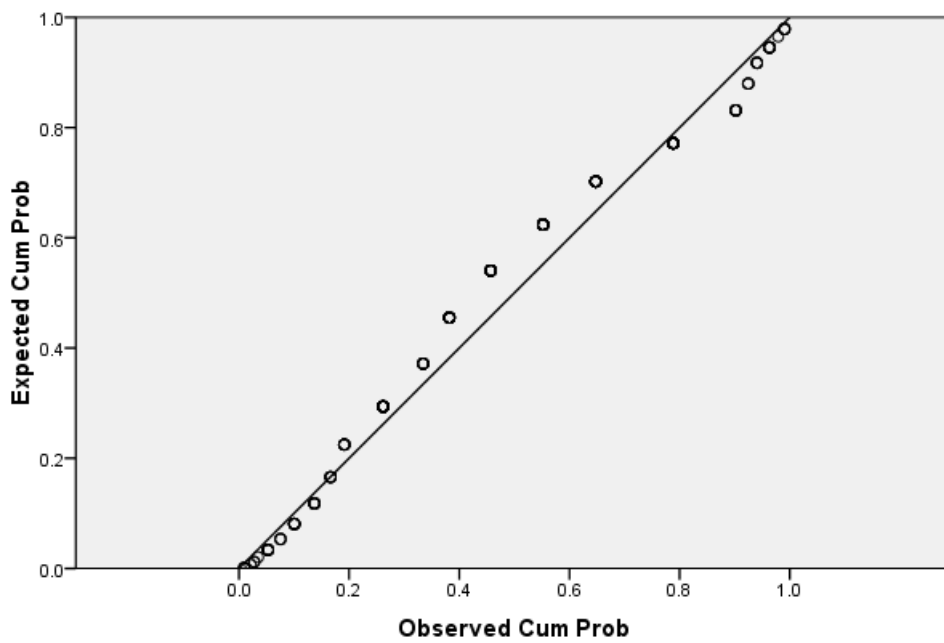
Normal P-P Plot of StratAI



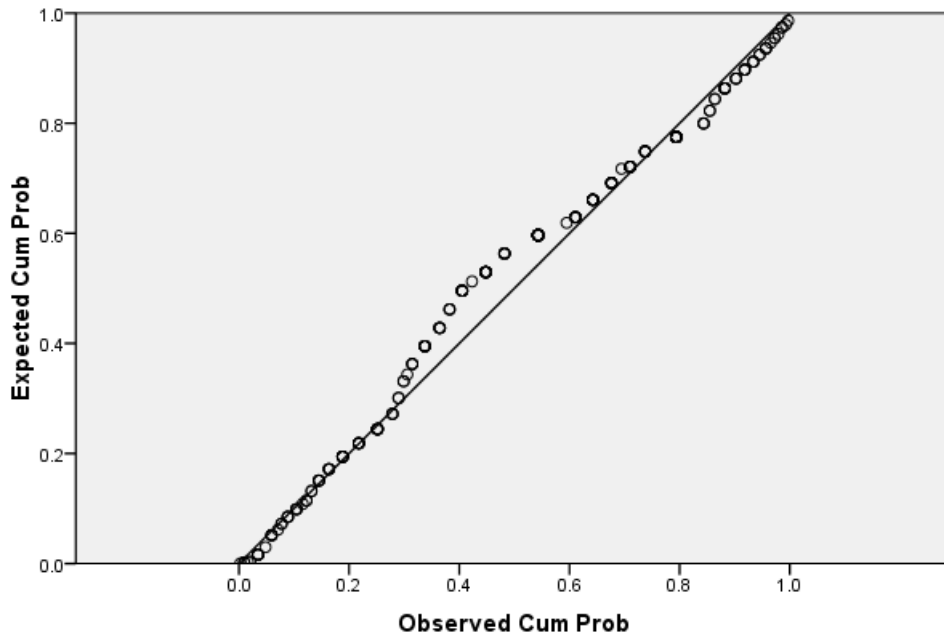
Normal P-P Plot of ITCapability



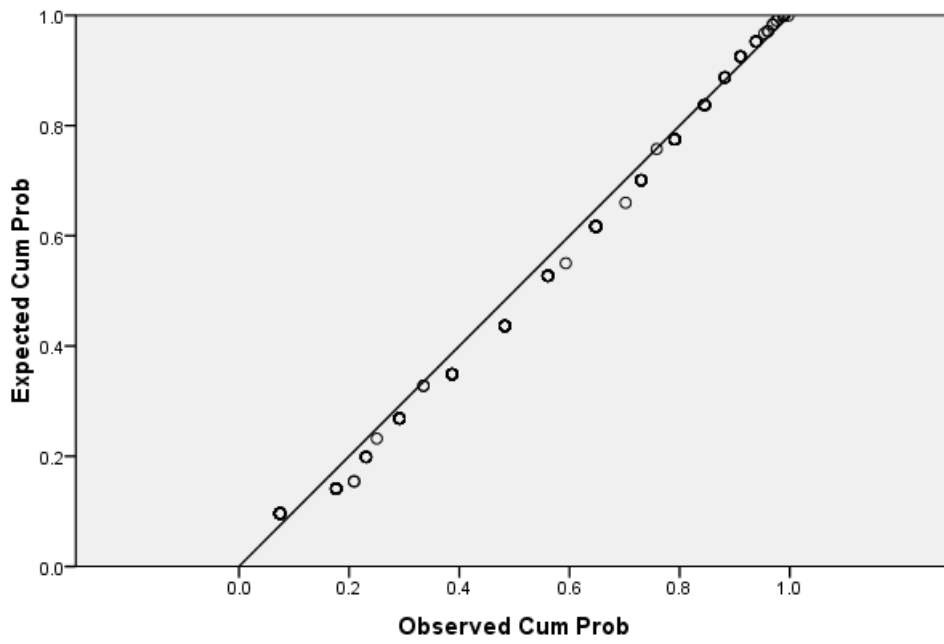
Normal P-P Plot of ProcFlex



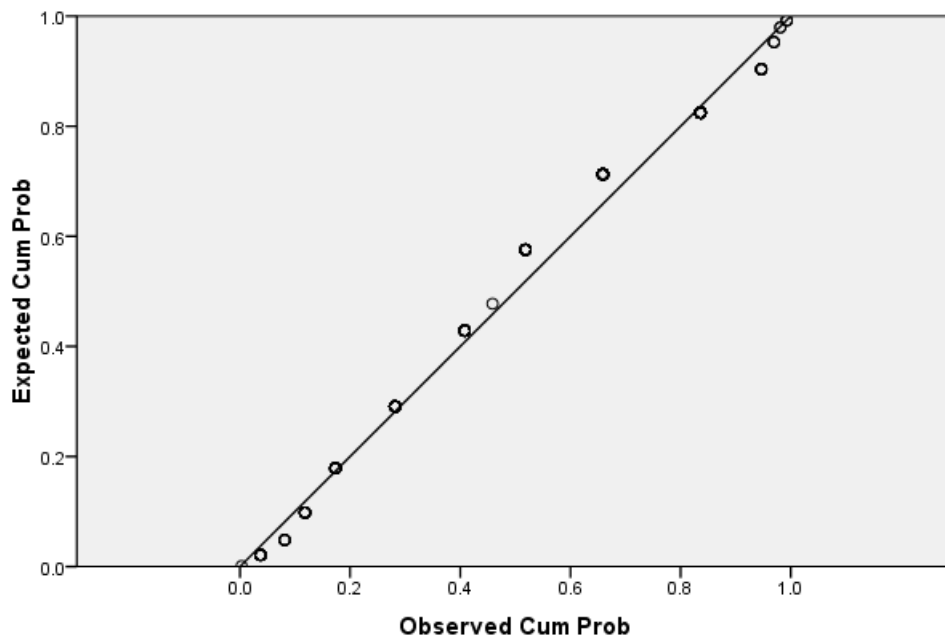
Normal P-P Plot of BPM



Normal P-P Plot of ITInvestment



Normal P-P Plot of SCA



Appendix 6: Post Survey Interview Form

Post Survey - Interview Session

Name: _____

Position: _____

Organisation: _____

Nature of business of your organisation:

Manufacturing

Services

Date of Interview: _____

Questions:

1. Is IT capability crucial in your organisation?
2. In what way is IT capability related to your organisations SCA?
3. In what way is IT capability related to your business processes?
4. In my study, it is observed that IT capability is not related to SCA. What is your opinion of this finding?
5. In my study, it is observed that IT capability is not related to BPM. What is your opinion of this finding?

Signature: _____

Appendix 7: Verbatim for Interview Sessions

Interview Session with Mr.Wan Nazmi held on 17th July 2012

1 Devika:

2 Good evening En.Wan.

3 My name is Devika, from University Malaya.

4 Thank you for agreeing to seeing me today.

5 So if it is okay I will go through the interview questions.

6 The first question that I have is that, based on my research, do you think that IT
7 capability is crucial in your organization?

8 Wan Nazmi:

9 Yes, I do think so.

10 IT capability is the tools in the current business.

11 I think in the current era of doing business IT capability is crucial to get things moving
12 and even to organize and to get the processes efficient through IT capability.

13 This is crucial to our organization as well.

14 Devika:

15 In what way is IT capability related to your organizations competitive advantage?

16 Wan Nazmi:

17 Assuming that IT capability setup in our organisation, the critical part is how these
18 things can be strategically aligned so that the organization can become very
19 competitive.

20 This is where most organization face challenges, because when you align the whole
21 thing together and at the same time try to be competitive.

22 And the challenge is when your organization is big and you have to move fast.

23 And to be competitive, you really have to be ahead of your competitors.

24 The problem with any organization is that when they have setup their business
25 processes, and everything is aligned, whatever new thing they want to do might have to
26 go against their processes or change their processes.

27 This is where they face challenges or they become very slow and less competitive.

28 So the challenge is that if the whole thing can be setup or realigned efficiently, that can
29 be sustainable competitive advantage for the organization.

30 But having said that, talking about competitive advantage also comes from internal and
31 external factors.

32 Internal factors also determine the competitiveness as well.

33 So, how the organization adopt to the change due to the external environment or the
34 internal factor, that will determine how successful they are in staying ahead of their
35 competitors.

36 Devika:

37 In what way is IT capability related to your business processes in your organisation?

38 Wan Nazmi:

39 Ideally, structure, strategy and IT capability should be used as the basis for us in
40 developing the business processes or make the processes efficient.

41 So basically when you have done all the alignment and setup the IT capability, the
42 whole processes must be changed to achieve the strategic objectives.

43 When you are aligned, you can develop very efficient processes.

44 But the challenge again in most organizations, the processes have been there for a long
45 time.

46 And when you have a new strategic objective, you have to change the processes.

47 So now you have to have a management of change process in the organization.

48 Devika:

49 In my study, I observed that IT capability is not related to competitive advantage.
50 What is your opinion of this finding?
51 Wan Nazmi:
52 I think this is related to my earlier answer as well.
53 When you talk about IT capability, this is where you have to realign your people your
54 process and your systems all together.
55 And whereby when you want to be very competitive, in the external environment, you
56 have to move very fast.
57 Move very fast means you have to respond to the market as soon as possible.
58 And with competitive advantage you have to come up with something even before your
59 competitors.
60 Devika:
61 So there may not be enough time to change your IT capability?
62 Wan Nazmi:
63 Yes, if you follow your structure or setup and processes in your organization, you may
64 not be able to move very fast.
65 So it possible that because of that it is not related.
66 To some extent, it is possible that there is a relationship but because of the nature that
67 how fast you can respond.
68 It is not how good is your process or how good is your IT systems but is how fast you
69 can move.
70 Having said that, if you have good IT capability and you have people with the right
71 capability, you have created competitive advantage in that area.
72 While other people catch up in that area, you can move further.
73 So the type of industry that use IT capability is Air Asia for example, when they had
74 started other airline have not really started.

75 To the extent that they have done it.

76 And now, other have caught up.

77 So they now have to move faster.

78 Ideally, if you want to create a competitive organization the strategies defined must

79 have the people, structure and processes aligned to it.

80 And all this requires effort.

81 And at the same time you want to move in front.

82 But the worse part once you have done that, the whole competitive environment has

83 changed again.

84 There has to be a balance.

85 Should not focus too much on internal alignment, just do what is required and then

86 move forward.

87 Devika:

88 My last question is that, it seems that IT capability was not related to business process

89 management.

90 What is your view on that?

91 The earlier question was on competitive advantage.

92 This question now is on business process management.

93 Wan Nazmi:

94 I think this is related to my point just now.

95 We talk about how the structure in any organization was created based on the people

96 and IT capability rather than the strategy.

97 In any organization, once you have the structure than you will come up with the

98 strategy.

99 From then on only then you develop your business process.

100 But rightfully, if your business process is based on strategy, then you realign your
101 structure and IT capability on how to achieve your strategy.

102 So that might be the reason that IT capability is not related.

103 In terms of IT capability as well, in most cases when organisations buy into IT systems
104 or business solutions, I think, most organisations are very dependent on the IT personnel
105 or vendor who bring in the systems.

106 When they do that, people in the organization will not have the real skill to maintain.

107 Also in most cases of IT implementation, they ask the IT vendor to make the systems
108 follow their business process.

109 Instead of changing your internal processes to maximize the purchase of the system,
110 you end up customizing the IT system to follow your old business process.

111 So because of that you end up doing the old way of doing things and just use IT as a
112 tool.

113 Instead of making the processes more efficient using the system that you have bought.

114 That's why you see in most cases when organisations buy IT systems they do a lot of
115 customisations.

116 We go on the assumption that in most cases IT systems have come up with some best
117 practices already.

118 So if you were to do IT implementation that must come with change management.

119 Change management should come together so that the new processes must be
120 developed.

121 In most cases, if the test comes up that way is because this is how it is practiced.

122 I guess that's how most organisations also practice in Malaysia.

123 Devika:

124 True. Otherwise, the results won't come out like that.

125 Wan Nazmi:

126 Ideally or theoretically it won't come out like that.

127 Of course we are not living in a perfect world.

128 There are a lot of challenges especially when you talk about dealing with people.

129 Of course you won't even have the best team but you still have to move ahead to

130 achieve your objective.

131 All the elements are important and have to be done right.

132 I think the challenge is to get it all aligned.

133 Devika:

134 Do you think that it would help if the elements of competitive advantage was thought

135 through at the beginning during the strategy phase?

136 Wan Nazmi:

137 I think in most cases when people do the strategy planning, they might have considered

138 the competitive advantage.

139 They would have considered their competitors and all.

140 So its not that it was not thought of upfront, but I think the challenge is that when you

141 have the competitive strategy, people are not clear on how to translate it into efficient

142 business process.

143 And of course we talk about you have to align and determine what is the best business

144 process.

145 This is done by the people.

146 Is not that competitive advantage is not thought of upfront, is just that the

147 implementation and translation into business processes is weak.

148 In most cases not many people have the skills to look into business process.

149 Even many people don't like to write the business processes.

150 Devika:

151 Ok, so that's all the questions that I have.

152 Thank you very much for your time En. Wan.

153 Wan Nazmi:

154 Ok and just wish you all the best.

155 Devika:

156 Thank you.

Interview Session with Mr. Shanmuga held on 19th July 2012

1 Devika:

2 Good morning Mr. Shanmuga.

3 Thank you for seeing me today.

4 The purpose of the interview today is actually to go through my questions with regards
5 to findings from my research.

6 So, the first question that I would like to ask is IT capability crucial in your
7 organization?

8 Shanmuga:

9 Good morning.

10 In terms of IT capability, I would say the emphasis is not there because even for an
11 employee who joins in we do not provide laptop.

12 We still use desktops.

13 And all employees are told to share their desktops.

14 So we do not emphasize much on IT capability.

15 Devika:

16 In what way is IT capability related to Western Digital's competitive advantage?

17 Shanmuga:

18 In terms of competitive advantage, there is not much relation.

19 The organization here is more driven by sales and marketing.

20 You see, our competitors do the same product.

21 So we have the same processes and cost structure and how fast you do it is actually the
22 competitive advantage for us.

23 Devika:

24 So there is very less on processes and IT capability internally.

25 In what way is IT capability related to your business process management?

26 Shanmuga:
27 The business processes have been there for a very long time.
28 IT capability does not make major changes to the business processes.
29 We have our traditional processes being maintained to remain cost competitive.
30 Because getting in more investment to do IT capability would increase our cost.
31 Devika:
32 So you want to keep the cost to the minimum.
33 So there will not be unnecessary investment that would result in increase to the cost.
34 Shanmuga:
35 Yes.
36 Devika:
37 Specifically to my studies, after the data was collected and analysed, it was observed
38 that IT capability was not related to competitive advantage.
39 This is true to what you explained earlier.
40 But can you explain further, in the context of Western Digital, how IT capability does
41 not contribute to competitive advantage?
42 Shanmuga:
43 IT capability like I mentioned before is very much related to cost.
44 In IT for example, if you bring in new equipment, you have to train more people.
45 You need to hire more people and incur cost for additional resources.
46 This is because 80% of our employees are operators involved in manufacturing line.
47 And the results may only be realized in the long term.
48 For this organization, it is not beneficial.
49 Devika:
50 My last question, IT capability was not related to business process management.
51 What is your opinion of this finding?

52 Shanmuga:

53 In our organization, we are still maintaining the traditional business processes.

54 Any change in IT capability, would result in additional cost, incur additional time and
55 affect production line.

56 And we do not want this to be part of the new business process management.

57 Probably that's why your findings also reveals that IT capability is not related to
58 business process management.

59 Devika:

60 That means there is also a concern that it would disrupt the change and we don't know
61 the outcome of the change.

62 Whether it will be more effective or actually worse.

63 Shanmuga:

64 Correct.

65 And whether we want to invest the time and money when this would disrupt them.

66 Especially when the competitors are moving forward and we would be left behind.

67 Devika:

68 With that, I am done with my interview.

69 Thank you very much for your time.

70 Shanmuga:

71 Thank you.

Interview Session with Mr. Hasnul held on 25th July 2012

Devika:

Good afternoon En. Hasnul.

Thank you for seeing me today.

The purpose of our interview today is actually to go through the findings of my research.

And maybe to get your help to get some answers or clarifications on the results of my findings.

The first question that I have, is IT capability important in your organization?

Hasnul:

I believe that in theory is very important.

But in reality of businesses even in Extol and so on and so forth, is that, there sometimes we, from a management point of view, we see that this is a need to do.

But the enforcement to actually realize it, from going down to making it a culture is the biggest challenge that we have.

There is always the gap there.

But definitely it is important for us to be different from others.

Devika:

In what way is IT capability related to your company's competitive advantage?

Hasnul:

This is all about provisioning.

We are in a very niche services, within security services.

It is already a very small market.

A market that no one really likes.

Is like insurance.

So therefore, finding how actually we position ourselves in the market is important.

By having a proper alignment to how we actually achieve that is crucial.

So in Extol we tend to target that.

Devika:

In what way is IT capability related to your business processes?

Hasnul:

That's where the gap is.

The direction and alignment is there.

But from a business process perspective is not clearly and is not explicit.

It is more indirect.

We know that we are basically going into this area but it is never really explicitly or no one sits down and clearly explains to the team to actually execute in that manner.

So there are general business processes but the execution portion is what is lacking.

Devika:

One of the findings observed from my study is that IT capability is not related to competitive advantage.

So what is your opinion of this?

Hasnul:

Truthfully, that is what that is happening now.

The reality is sometimes it is about enforcement and sticking to whatever we decide.

So sometimes, the shareholders and stakeholders demands cause us to sway a bit.

Because in the end people look at how fast we can get the money.

This is the main reason why is causing that problem.

IT capability, at least in Extol is very important.

Because we are doing service whereby basically we require automation.

Basically with large correlations within systems that cannot be done by people.

We are talking about millions of data and millions of events that needs to be correlated automatically.

To assist to know basically if there is a threat.

So IT capability in Extol, we are basically leveraging on it.

On the other hand, some companies are too idealistic.

If that does not pose a challenge, the other problem that companies have it the top down cascade of strategic objectives.

There are a lot of strategies that are defined from a management point of view.

But it becomes very motherhood statements when it comes to actual execution.

So then we have people who are executing it off tangent.

It is within the area but not effective.

Sometimes this happens because of stakeholders demands too.

This two reasons sometimes cause us to set goals that are sometimes unrealistic.

Is not that it cannot be achieved.

It means that the probability for it to be achieved and the necessary measures for it to be achieved is really hard.

It even means that we may need to get a certain group of people that can create or realize those things.

So maybe internal is not enough.

So when it comes to more investments, typically what will happen is we decide to cut down on that investment but the alignment does not happen.

Devika:

Meaning IT capability is the one that gives you competitive advantage in your niche area?

Hasnul:

Yes.

Devika:

My last question.

IT capability was observed that it was not related to business process management.

What is your opinion of this finding?

Hasnul:

This is very true because lately a lot of companies are driven by IT.

Business tends to become sales.

So then they define that and move forward.

So sales will say IT lets look at what you have and see what we can do.

And that is what we sell.

Rather than to define what we are going to sell and work backwards.

Because if we do from backwards, our strategy and structure can be misaligned.

So this is why is see that there is a gap again.

Because of the backward to forward relationship.

If we define everything initially and clearly and allow the rest to support it than it should be more aligned.

Devika:

That is all my questions for today.

Thank you very much for your time En. Hasnul.

Hasnul:

Thank you.