

IT Governance Processes Selection  
Driven by Contingency Theory

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การเลือกกระบวนการธรรมเนียมปฏิบัติด้านเทคโนโลยีสารสนเทศ  
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สฤณา ศรีอินมัย : การเลือกกระบวนการธรรมาภิบาลด้านเทคโนโลยีสารสนเทศที่ขับเคลื่อนโดยทฤษฎีเชิงสถานการณ์ (IT Governance Processes Selection Driven by Contingency Theory) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: อ. ดร. วัชรวิภา จันทาทับ, 177 หน้า.

ในโลกปัจจุบันเทคโนโลยีสารสนเทศกลายเป็นสิ่งที่พบได้มากขึ้นทั้งกิจกรรมในชีวิตและกิจการในธุรกิจ ควรจะกำหนดที่ยืนของเทคโนโลยีสารสนเทศอย่างไรเพื่อให้สามารถสนับสนุนเป้าหมายขององค์กรและกลยุทธ์ของธุรกิจนับเป็นวาระระดับต้นสำหรับผู้บริหารระดับสูง ยิ่งฟังก์ชันของเทคโนโลยีสารสนเทศสอดคล้องกับกลยุทธ์ของธุรกิจมากขึ้นก็จะช่วยให้สามารถปรับปรุงประสิทธิภาพของธุรกิจโดยรวมและเพิ่มการเติบโตของผลกำไร การธรรมาภิบาลด้านเทคโนโลยีสารสนเทศที่มีประสิทธิภาพจะช่วยให้มั่นใจได้ว่าธุรกิจและเทคโนโลยีสารสนเทศมีความสอดคล้องกัน กรอบงาน แนวปฏิบัติที่เป็นเลิศ และมาตรฐานการธรรมาภิบาลด้านเทคโนโลยีสารสนเทศจำนวนมากได้ถูกพัฒนาขึ้นมาตลอดช่วงเวลาที่ผ่านมามีและได้ถูกนำไปใช้โดยองค์กรต่างๆ ทั่วโลก แต่อย่างไรก็ตามองค์กรยังคงดิ้นรนในการเลือกว่ากระบวนการในการธรรมาภิบาลเทคโนโลยีสารสนเทศใดบ้างที่ควรดำเนินการ ดังนั้นการศึกษานี้ได้สำรวจทฤษฎีเชิงสถานการณ์และแนวคิดการรับรู้จากด้านจิตวิทยาว่า จะสามารถช่วยตอบคำถามนี้ได้อย่างไร จากการใช้เทคนิคเดลฟายพบว่าเจ็ดตัวแปรจากทฤษฎีเชิงสถานการณ์ ได้แก่ กลยุทธ์องค์กร โครงสร้างองค์กร ขนาดขององค์กร สิ่งแวดล้อมภายนอก เทคโนโลยีกระบวนการทำงาน และวัฒนธรรมองค์กร มีอิทธิพลต่อการเลือกกระบวนการในการธรรมาภิบาลเทคโนโลยีสารสนเทศ เทคนิคเดลฟายได้ถูกนำมาใช้กับผู้เชี่ยวชาญด้านการธรรมาภิบาลเทคโนโลยีสารสนเทศที่มีประสบการณ์จากอุตสาหกรรมที่แตกต่างกันจำนวน 19 ท่าน เพื่อให้ได้มาซึ่งความเห็นและการรับรู้เกี่ยวกับการเลือกกระบวนการในการธรรมาภิบาลเทคโนโลยีสารสนเทศผ่านการรวบรวมข้อมูลหลายรอบ จากนั้นได้นำผลการศึกษาไปนำเสนอและทำการสัมภาษณ์ขอความคิดเห็นกับกลุ่มผู้เชี่ยวชาญอีกกลุ่มหนึ่งจำนวน 3 ท่าน เพื่อเพิ่มความน่าเชื่อถือของผลการวิจัย นอกจากนี้งานวิจัยนี้ได้เสนอแนวทางในการจัดกลุ่มกระบวนการในการธรรมาภิบาลเทคโนโลยีสารสนเทศ ผลจากงานวิจัยนี้จะช่วยองค์กรให้สามารถระบุว่าการธรรมาภิบาลเทคโนโลยีสารสนเทศใดบ้างที่มีค่ามากที่สุดที่องค์กรควรนำไปดำเนินการ

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# # 5383165226 : MAJOR INFORMATION TECHNOLOGY IN BUSINESS

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SAKUNA SRIANOMAI: IT Governance Processes Selection Driven by Contingency Theory. ADVISOR: WACHARA CHANTATUB, Ph.D., 177 pp.

In today's world, information technology (IT) becomes more ubiquitous in both life and business activities. How IT can be positioned to support organizational goals and business strategies is now a top agenda for all executives. The more alignment of IT function and business strategy can improve overall business performance and increase profitable growth. Effective IT governance helps ensure the alignment between business and IT. Many IT governance frameworks, best practices, and standards have been developed over time and utilized by organizations all over the world. However, organizations still struggle with selecting what IT governance processes they should implement. Therefore, this study explored how contingency theory and perception concept from psychology area can help answer the question. By using Delphi technique, seven variables from contingency theory which are strategy, structure, size, environment, technology, task and culture were found to influence IT governance process selection. The Delphi technique was conducted with nineteen IT governance experts from different background experiences to draw the opinions and perceptions of IT governance process selection through multistage of data collection. To increase validation, face to face interview with another three experts was conducted to present the finding and asked for comments. Furthermore, this study also provides a guideline to consolidate IT governance processes. The result of this research could help organizations to identify the most valuable IT governance processes to be implemented.

Field of Study: Information Technology in Student's Signature .....

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## CONTENTS

|  | Page |
|--|------|
| THAI ABSTRACT .....                          | iv   |
| ENGLISH ABSTRACT .....                       | v    |
| ACKNOWLEDGEMENTS .....                       | vi   |
| CONTENTS .....                               | vii  |
| Table of Figures.....                        | xi   |
| List of Tables .....                         | xiii |
| Chapter 1 Introduction.....                  | 1    |
| 1.1 Background.....                          | 1    |
| 1.2 Problem Statement.....                   | 3    |
| 1.3 Purpose of Study .....                   | 5    |
| 1.4 Scope of study .....                     | 6    |
| 1.5 Assumption .....                         | 7    |
| 1.6 Contribution .....                       | 9    |
| 1.7 Summary.....                             | 10   |
| Chapter 2 Literature Review.....             | 12   |
| 2.1 IT Governance.....                       | 12   |
| 2.1.1 IT Governance Definition.....          | 12   |
| 2.1.2 IT Governance Concept.....             | 14   |
| 2.1.3 IT Governance Benefits .....           | 20   |
| 2.1.4 IT Governance Process .....            | 21   |
| 2.2 Business-IT Alignment .....              | 33   |
| 2.2.1 Business-IT Alignment Definition ..... | 34   |

|   | Page |
|---|------|
| 2.2.2 Business-IT Alignment Model.....                        | 35   |
| 2.2.3 Business-IT Alignment Benefit.....                      | 39   |
| 2.3 The Contingency Theory .....                              | 40   |
| 2.3.1 Evolution of Contingency Theory .....                   | 40   |
| 2.3.2 Contingency theory in MIS Research.....                 | 42   |
| 2.3.3 Contingency Variables in IT governance.....             | 44   |
| 2.4 Perception Concept .....                                  | 46   |
| 2.5 Conceptual Model.....                                     | 48   |
| 2.6 Summary.....  | 49   |
| Chapter 3 Methodology .....                                   | 51   |
| 3.1 Research Method.....                                      | 51   |
| 3.1.1 Qualitative Method .....                                | 51   |
| 3.1.2 Delphi Technique .....                                  | 52   |
| 3.2 Research Design .....                                     | 55   |
| 3.3 Research Procedure.....                                   | 58   |
| 3.3.1 Phase 1: Discovery Factors .....                        | 58   |
| 3.3.2 Phase 2: Determining the Important Factors.....         | 59   |
| 3.3.3 Phase 3: Ranking the Factors .....                      | 59   |
| 3.3.4 Phase 4: Formulating and Validating the Guideline ..... | 60   |
| 3.4 Research Context.....                                     | 61   |
| 3.4.1 The Experts.....  | 61   |
| 3.4.2 Interview Guide and Questionnaire .....                 | 63   |
| 3.5 Data Collection.....                                      | 72   |



|   | Page |
|---|------|
| 3.5.1 Phase 1: Discovery Factors .....                        | 73   |
| 3.5.2 Phase 2: Determining the Important Factors .....        | 80   |
| 3.5.3 Phase 3: Ranking the Factors .....                      | 80   |
| 3.5.4 Phase 4: Formulating and Validating the Guideline ..... | 81   |
| 3.6 Data Analysis.....  | 83   |
| 3.7 Summary.....  | 84   |
| Chapter 4 Result.....   | 86   |
| 4.1 Phase 1: Discovery Factors.....                           | 87   |
| 4.1.1 Part 1: IT Governance Perception .....                  | 89   |
| 4.1.2 Part 2: Related Factors .....                           | 96   |
| 4.2 Phase 2: Determining the Important Factors .....          | 99   |
| 4.3 Phase 3: Ranking the Factors.....                         | 101  |
| 4.3.1 Round 1 of Phase 3.....                                 | 101  |
| 4.3.2 Round 2 of Phase 3.....                                 | 104  |
| 4.4 Phase 4: Formulating and Validating the Guideline.....    | 109  |
| 4.4.1 Formulating Guideline .....                             | 110  |
| 4.4.2 Validating Guideline .....                              | 117  |
| 4.5 Summary.....  | 124  |
| Chapter 5 Discussion.....                                     | 126  |
| 5.1 Research Summary .....                                    | 126  |
| 5.2 Discussion .....  | 128  |
| 5.2.1 Discussion on result and additional finding .....       | 128  |
| 5.2.2 Linkage the result to research questions .....          | 130  |

|                                   | Page |
|-----------------------------------|------|
| 5.3 Contribution .....            | 131  |
| 5.3.1 Academic Contribution.....  | 131  |
| 5.3.2 Practical Contribution..... | 133  |
| 5.4 Limitation.....               | 134  |
| 5.5 Future Research .....         | 135  |
| 5.6 Summary.....                  | 136  |
| REFERENCES .....                  | 137  |
| VITA.....                         | 177  |



## Table of Figures

|   |    |
|---|----|
| Figure 2-1: Corporate Governance and Key Asset Governance .....   | 15 |
| Figure 2-2: Five area of IT governance principle .....  | 17 |
| Figure 2-3: Model for Corporate Governance of IT.....   | 18 |
| Figure 2-4: Relationship of IT Governance Elements .....  | 23 |
| Figure 2-5: Frameworks related to IT Governance (Adapt from Radcliffe, 2004) .....                                  | 25 |
| Figure 2-6: High Level Classification of IT Governance Frameworks .....   | 26 |
| Figure 2-7: ITIL Service Life Cycle.....  | 27 |
| Figure 2-8: ITIL v3 Service Management Processes .....  | 28 |
| Figure 2-9: COBIT5 Principles.....  | 29 |
| Figure 2-10: COBIT5 Process Reference Model.....  | 29 |
| Figure 2-11: COBIT5 coverage of other standards and frameworks .....  | 31 |
| Figure 2-12 : Strategic Alignment Model (SAM) .....   | 36 |
| Figure 2-13: Dimensions of STROIS and STROBE .....  | 37 |
| Figure 2-14: Criteria for Assessing Business/IT Strategic Alignment Maturity .....                                  | 38 |
| Figure 2-15: A Simplified Model of Contingency Theory in Organizational Research<br>(Szilagyi & Wallace, 1980)..... | 41 |
| Figure 2-16: Representation of Contingency Theory in MIS Research (Weill &<br>Margrethe, 1989).....                 | 43 |
| Figure 2-17: Components of Perceptual Process.....  | 47 |
| Figure 2-18: Conceptual Model of IT Governance Processes Selection.....   | 49 |
| Figure 3-1: Research Design .....   | 57 |
| Figure 3-2: Research Procedures .....   | 60 |
| Figure 3-3: Research Timeline .....   | 72 |

|   |     |
|---|-----|
| Figure 4-1: Contingency Variables Influence .....                                 | 101 |
| Figure 4-2: Chart of summarize influence level of each contingency variable ..... | 109 |
| Figure 4-3: Example of clustering table interpretation .....                      | 114 |
| Figure 4-4: The Seven Phases of the Implementation Life Cycle .....               | 119 |



## List of Tables

|   |     |
|---|-----|
| Table 2-1: Some Definitions of IT governance .....  | 13  |
| Table 2-2: IT Governance Decision-making Domains .....  | 18  |
| Table 2-3: Structures, Processes and Relational Mechanisms for IT Governance .....  | 22  |
| Table 2-4: Description of Contingency Variables in MIS (Weill & Margrethe, 1989).....   | 43  |
| Table 3-1: Major Phases of Conducting Delphi Technique.....   | 54  |
| Table 3-2: IT Governance Processes.....   | 64  |
| Table 3-3: Participants' Demographic Data and Experiences.....  | 79  |
| Table 4-1: Participant Characteristic Summarization.....  | 88  |
| Table 4-2: Percentage of Implementation .....   | 90  |
| Table 4-3: Percentage of Importance level to organization.....  | 92  |
| Table 4-4: Percentage of Business-IT Alignment level.....   | 93  |
| Table 4-5: Percentage of Perception.....  | 95  |
| Table 4-6: Response to Contingency Factors.....   | 97  |
| Table 4-7: Frequency of IT governance processes of Each Contingency Factor.....   | 100 |
| Table 4-8: Ranking of Contingency Factors .....   | 102 |
| Table 4-9: Frequency of each contingency variable influence to number of IT<br>governance process classified by participant. .... | 105 |
| Table 4-10: Summarization of influence level of each variable. ....   | 106 |
| Table 4-11: Percentage of each contingency variable influence classified by IT<br>governance process. ....                        | 108 |
| Table 4-12: Scenario 1-High level of seven contingency variables Influencing &<br>Importance & Business-IT Alignment.....         | 111 |

|   |     |
|---|-----|
| Table 4-13: Scenario 2-Medium level of seven contingency variables Influencing & Importance & Business-IT Alignment ..... | 112 |
| Table 4-14: Scenario 3-Low level of seven contingency variables Influencing & Importance & Business-IT Alignment .....    | 113 |
| Table 4-15: Comparison of Scenario 1(High Level) and Scenario 2 (Medium Level) .  | 116 |



## Chapter 1 Introduction

This chapter provides an introductory of this research. The relevance issues of this research will be explained including the research background, problem statement, research objective, research question, scope of study, assumption and contributions. Finally, the structure of this study will be described.

### 1.1 Background

Information technology (IT) has become an essential part in management of business as it is used to support enterprises in business process improvement, sustainability, and growth. In the highly competitive market of today, all enterprises have to innovate or change over the time to gain a strong competitive advantage. By facilitating business change in current dynamic environment, IT has become a backbone of organizations at every business level and turned to be a pervasive element in flexible business processes. Effective IT can help organizations to increase business performance, improve productivity, generate more profit and gain competitive advantage (Melville, Kraemer, & Gurbaxani, 2004). In today's world, IT plays an increasingly proactive role in developing long-term business strategy and helping to transform business processes to gain more competitive advantage. To ensure that business processes, corporate strategy and IT strategy are completely synchronized, the alignment of business with IT is necessary (Henderson & Venkatraman, 1993).

The harmonize between business and IT can essentially improve overall business performance, increase profitable growth (Sabherwal & Chan, 2001). Furthermore, alignment of the organization's IT operations with its business not only can complement business strategy, but also can enable organizations to generate business value from the IT investment (Bharadwaj, 2000). In order to achieve the benefit of business-IT alignment, organizations call for a specific focus on IT governance (De Haes & Van Grembergen, 2015).

IT governance is the processes that ensure the effective and efficient use of IT in order to enable an organization to achieve its strategies and objectives (ITGI, 2003). IT governance is the structure of relationships and processes to develop, direct

and control IT resources (Korac-Kakabadse & Kakabadse, 2001). IT governance is accepted as a key success factor in achieving enterprise's goals. Besides, one of the main goals of IT governance adoption is to enable the organizations to achieve the alignment between business and IT strategies, which is crucial for achieving competitive advantage. Since 2003, IT governance has been ranked among the top ten CIO technology priorities by Gartner Inc. (Young, 2004). The dependency upon IT in the current dynamic business environment needs effective management of IT and its alignment with business goals. That is the reason why IT governance and business-IT alignment issues are important and should be concerned for the organization success.

To support the implementation of IT governance, a variety of international standards, best practices, guidelines, and frameworks have been developed. Among them, the most widely used framework is COBIT, which is Control Objectives for Information and Related Technology (G. Ridley, Young, & Carroll, 2004). It was designed in 1996 by Information System Audit and Control Association (ISACA) to support IT governance in managing and understanding the risks and benefits of IT. In 2012, the latest version of COBIT (COBIT5) was released with a set of IT governance processes to provide a broader view of end-to-end responsibilities in IT governance (ISACA, 2012b). Prior research explored a relationship of COBIT implementation through business outcome and the finding demonstrated that the more the maturity level of IT process from COBIT, the more it can enable the benefit of business-IT alignment (De Haes & Grembergen, 2009). Considering many IT governance adoption outcomes and the availability of IT governance processes from many frameworks, it might assume that IT governance should be extensively implemented in most of the organizations across the world.

Although, academic literatures indicated many benefits from IT governance process adoption but there was still limited suggestion or guideline concerning IT governance processes selection. For this reason, understanding the rationale behind how to choose IT governance processes to gain the most benefit by revealing influencing factors and how such factors affect the IT governance processes selection is a very important topic. The original assumption of contingency theory is that there



is no single best way of making a decision because it depends on environment of each organization (Fiedler, 1964). In MIS (Management Information System) field, Weill and Margrethe (1989) adopted the contingency theory to define a set of contingency variables that can explain the fit between MIS and organization performance. This study shed light on that each organization might have different way or environment that can impact to IT governance processes selection. Therefore, this research aims to understand and identify what contingency factors are highly related to IT governance processes selection with regard to achieving the ultimate outcome of business-IT alignment. In addition, the perception concept in psychology field that used to describe how people make a decision to select something will be applied in this study to discover the insight into IT governance perception.

## 1.2 Problem Statement

Academic literatures indicate that IT governance is appeared to be an important issue in day to day business operations and the adoption of IT governance processes can return many benefits to organizations (De Haes & Van Grembergen, 2015; Gerrard, 2009; Parvizi, Oghbaei, & Khayami, 2013; Webb, Pollard, & Ridley, 2006). Recent studies confirmed that the adoption of IT governance processes from best practice frameworks such as COBIT can help organization to ensure its business-IT alignment and increase business value creation (De Haes & Van Grembergen, 2015). Past literatures also demonstrated the outcome benefits of the alignment between business and IT such as to improve business performance (Byrd & Davidson, 2006; Sabherwal & Chan, 2001), to increase organization profits (Yolande E. Chan, Huff, Barclay, & Copeland, 1997; Cragg, King, & Hussin, 2002; Powell, 1992) and to enlarge business outcome (Bergeron, Raymond, & Rivard, 2004; Y. E. Chan, Sabherwal, & Thatcher, 2006).

Even though it has been realized that the outcome benefit from better business and IT alignment is large as well as there are numerous IT governance frameworks provided, only 30% of organizations across the world decided to implement IT governance processes suggested in IT governance frameworks (ITGI, 2008). The survey of companies listed on the Stock Exchange of Thailand (SET) to

assess whether the organizations in Thailand aware and adopt IT governance frameworks revealed that only 20% of the respondents (46 of 229 companies) adopted IT governance framework (Samithisomboon & Chantatub, 2013). Later, the online survey of companies in Thailand to investigate the implementation of COBIT5's IT governance processes revealed that only 37% of the respondents implemented IT governance processes from all five domains in COBIT5 (Samithisomboon & Chantatub, 2014). COBIT is an IT governance framework developed by IT Governance Institute (ITGI) and COBIT5 is the latest version.

Although literature review expresses many benefits and success cases of IT governance processes implementation, it is debatable why it has not been widely implemented. It is still lack of study that focuses on the initial stage, IT processes selection, before the implementation stage. In order to gain better understanding of this issue, this study aims to determine what and how contingency factors can explain IT governance processes selection. Thus, the problem statement of this research is;

*What are the contingency factors that involve and influence IT governance processes selection?*

In order to answer the above problem statement, this study needs to identify and explain relevant factors or variables that influence an organization to select appropriate IT governance processes. Based on the adoption of contingency theory in MIS that identify the best fit contingency variables (namely strategy, structure, size, environment, technology, task and culture) to the design and use of the MIS, it revealed that this approach can influence an organization performance (Weill & Margrethe, 1989). From previous literature reviews, researchers had investigated and applied these contingency variables to explain IT governance context, for example, to arrange IT governance structure, and to measure the successful of IT governance adoption. However, there is no study on how to apply the contingency theory to IT governance processes selection. Thus, this study focuses on the exploration of relevant contingency factors in IT governance processes selection and it is addressed in the following research question.

Q1: *What contingency factors influence the selection of IT governance processes?*

Many best practice frameworks provide a set of IT governance processes for supporting organizations to implement IT governance. However, current literatures do not provide much explanation on how to select appropriate IT governance processes to achieve the ultimate goal which is business-IT alignment. Based on the assumption of contingency theory, an organization should select IT governance processes to be implemented by considering its best fit contingency factors. In other words, each organization has different requirements and environment that can be explained by a number of contingency factors. The linkage of IT governance processes selection, business-IT alignment, and contingency factors will open a new point of view on how to make a decision to implement IT governance processes to achieve the final outcome. Therefore, this issue leads to the next research question.

Q2: *How can contingency factors be adopted to derive an IT governance processes selection guideline that concerns business-IT strategy alignment?*

The answer to these two research questions will help to fulfill research gap and provide more knowledge for academia and practitioner in IT governance processes selection.

### **1.3 Purpose of Study**

The previous section discussed about problem statement and addressed the research questions that aim to identify contingency factors to explain the selection of IT governance processes. Previous literatures have limited in explaining the selection of IT governance processes to fit organization's environment. As a result, the ultimate goal of this research is to provide a guideline for IT governance processes selection which is driven by contingency theory and focuses on business-IT strategy alignment.

To gain insight into IT governance processes selection, the objectives of this research are stated as follows:

- To identify and determine the effect of contingency factors influencing the selection of IT governance processes.

- To formulate a guideline driven by contingency theory for selecting IT governance processes.

#### **1.4 Scope of study**

To accomplish these research objectives, first, this study needs to explore which contingency factors, such as strategy, structure, size, environment, technology, task, and culture, strongly influence IT governance processes selection and discover how each contingency factor affects the selection of each IT governance process. Second, this study will suggest a guideline for selecting IT governance processes to be implemented in order to enhance an organization's business-IT strategy alignment.

This study is designed to adopt qualitative method using Delphi technique as a research method. Delphi technique is a research approach conceived as a way to aggregate the opinions from participants in order to gain unanimity through a multiple-rounds of questionnaire surveys (Hanafin, 2004). This technique aims to draw the opinions from respondents who have well-knowledge, deep understanding or experience in the specific area. In this study, IT governance is considered as the specific area. The key advantage of this technique is the anonymity in responding to individual question by anonymous to each other since it is especially useful for avoiding direct confrontation of the participants (Goodman, 1987). In this study, the main research design is divided into four phases according to the three phases from Delphi technique and one more extra phase for validating the finding.

The first phase, discovery factors, aims to explore what contingency factors related to IT governance processes selection. To achieve this purpose, an in-depth interview technique is employed to solicit the insights, ideas, attitudes and experiences from participants. The contingency theory and perception concept are used as the theoretical bases to frame the interview guide. The result from this phase is a list of contingency factors and important IT governance processes to enhance the alignment between business and IT. This finding uses as a basis information to develop the first questionnaire in the second phase.

The second phase, determining the important factors, the first questionnaire is distributed to all participants and then asks the experts to validate the important factors that affect each IT governance process.

The third phase, ranking the factors, the finding from the second phase is used to refine the questionnaire. This new questionnaire asks all participants to prioritize the factors that impact to each IT governance process. Then, the feedbacks are analyzed. If the result cannot gain the consensus, the participants will be asked to provide more comment or information that can help to refine the next questionnaire for conducting the next round. This process is iterative until it gains the consensus. When the result achieves the consensus, the final result will be summarized to formulate a guideline for IT governance processes selection.

Lastly, formulating and validating the guideline, the formulated guideline will be verified by another group of experts called as validators. This approach will help to increase the credibility of the suggested IT governance processes selection guideline.

In conclusion, this study will conduct both interview and survey to collect the data with a group of IT governance experts. It will also conduct a face-to-face interview with a group of validators to validate the findings and the guideline in order to increase the reliability of the results. Therefore, this study requires two groups of IT governance experts to be the research subjects, participants and validators.

## **1.5 Assumption**

According to contingency theory in MIS, Weill and Margrethe (1989) stated that the better fit contingency variables, the better organizational performance. This study assumes that there is an underlying relation between contingency variables that influence IT governance processes selection. Moreover, if organizations select to implement a better fit IT governance processes, they could reach the ultimate goal in IT governance which is business-IT alignment.

From literature review, Weill and Margrethe (1989) identified seven contingency variables including strategy, structure, size, environment, technology, task,

and culture as potential variables for explain the phenomenal of MIS research that can influence business performance. Past literatures studied some contingency variables on IT governance context however it did not provide sufficient explanation on how contingency variables influence the selection of IT governance processes. As a result, this research adopted contingency factors or variables to be the predictors to explain the selection and to explore influence degree with IT governance processes selection in order to achieve business-IT strategy alignment outcome.

Apart from IT governance processes defined in academic work, many best practice frameworks also provide IT governance processes. There are various frameworks that related to IT governance and each framework offers its set of IT governance processes. However, the most global widely accepted IT governance framework is COBIT (G. Ridley et al., 2004) which in its current version, COBIT5, divides the IT governance into 37 processes with grouped into five domains that incorporates many important international standards and frameworks (ISACA, 2012a). This research focuses on the outcome of business-IT alignment which highlights in strategic area and covers only two domains in COBIT5. Therefore, this research concentrates on eighteen IT governance processes from two domains of COBIT5 which are EDM (Evaluate, Direct and Monitor) and APO (Align, Planning and Organize).

The underlying assumption of perception concept from psychology field stated that people will select or make a decision to adopt something depending on their perception (Uhl-Bien, Schermerhorn Jr, & Osborn, 2013). Perceptual process can be divided into four stages: exposure, attention, interpretation, and response (Solomon, Russell-Bennett, & Previte, 2012). This research assumes that understanding of IT governance perception may help to explain the selection of IT governance processes. For this reason, this study considers to employ this concept as the supplementary principle to construct the interview question to draw the insight information about IT governance from research participants.

## 1.6 Contribution

The purpose of this research is to understand and identify what and how contingency variables related to IT governance processes selection in achieving business-IT alignment. Beyond that, the ultimate purpose of this study is to formulate an IT governance processes selection guideline to enhance business-IT alignment that is driven by contingency theory. To accomplish these research objectives, this research applied contingency theory as a focal theoretical and employed perception concept to design an interview questions. Data collection and analysis was conducted by following Delphi technique. This technique was used to solicit the idea from a group of experts in IT governance domain. The findings from the three main phases of Delphi technique will reveal the influence level of each contingency factor and perception of IT governance processes selection. To increase the reliability of the results and guideline formulated, one more phase was added to ask another group of experts to validate the findings. In so doing, the final outcome of this research could contribution to both theoretical and practical sides.

For theoretical contribution, this study would expand understanding and explanation of IT governance processes selection that derives from contingency theory. Furthermore, the influence level of each contingency factor related to the selection of IT governance processes is also demonstrated. Moreover, this research finding will produce the growing body of work on the contingency factors supplementary with perception concept to describe IT governance process selection. In addition, this study provides systematic and constructive approach to formulate a clustering guideline. With this knowledge and outcome, hopefully it will be a stepping stone for further research in this area.

For practical contribution, the influence level of each contingency factor will help practitioner or implementer to identify the priority of IT governance process to be implemented in which each organization could apply to its individual situations. Furthermore, the result from this study intends to provide systematic approach to structure a guideline for IT governance processes selection. The clustering guideline will help organization to determine the relevant contingency factors. Also, it could

help organizations to select appropriate set of IT governance processes that align with their IT and business objectives. In overall, this distinct guideline also aims to simplify IT governance adoption by serving as a practical guideline.

In conclusion, the researcher hopes that these contributions can help researchers and practitioners to clarify and build upon an understanding of IT governance processes selection with regard to the influence level of each contingency factor. More or less, the relevant implication of this study will suggest a way for selecting an appropriate IT governance processes.

### **1.7 Summary**

This chapter presented the background of this research. First it introduced the essential of IT that IT has become an essential part of business operations to enable business transformation. The problem statement and two research questions were described. This chapter also addressed the objectives, scope of this study and assumption. This thesis is organized into five chapters and at the end of each chapter a summary section that bring the brief conclusion of each chapter is provided. The four remaining chapters provide a synopsis of this research as follows.

Chapter 2 is an extensive literature review that provides the exploration of the topics related to this research domain. The literature review starts with the definition, concept and benefits of IT governance, and IT governance processes domains. It is then followed by the reviewing of contingency theory and perception concept that are the important foundations for framing this research study. Finally, it indicates a conceptual model of this research.

Chapter 3 explains a summary of research methodology including qualitative technique and Delphi technique. This chapter describes the main research design which contains four phases and each phase explains the core procedure to explore the data from a group of experts. The research context, data collection step and a way to analyze data are also explained.

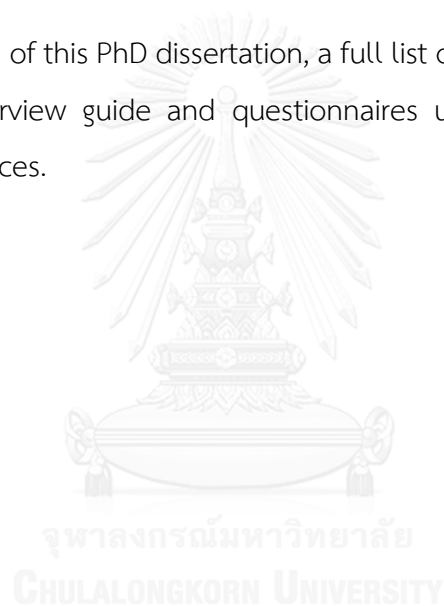
Chapter 4 provides all results from all four major phases that executed in this research. In the first three phases, a group of nineteen participants were asked to



express their insights and opinions on IT governance processes selection related to seven contingency factors. In the last phase, the way to formulate the guideline is presented, followed by reporting the results from a group of three validators whether the findings and guideline can contribute in real practical world.

Chapter 5 bring all results and findings to draw academic and practical contributions. The relation of the findings with each research question represents in this chapter. The conclusions of this research's contribution are translated into recommendation for practitioners. Finally, the limitations of the research are presented and some recommendations for further research are also expressed.

At the end of this PhD dissertation, a full list of bibliography is included and the example of interview guide and questionnaires used during the research are presented in appendices.



## Chapter 2 Literature Review

To understand background of this research, the thorough literature review was conducted and explained in this chapter. This chapter is divided into five main sections to explain theoretical foundation supporting the development of this research. The first section describes the definition, concept of IT governance and its processes, as well as the benefit of IT governance processes implementation. The second section discusses key benefits of IT governance adoption, which is better business-IT alignment. The third section briefly presents the development of contingency theory and the role of contingency theory in MIS and IT governance research. The fourth section discusses about perception concept which is regarded as a supplementary concept to design interview guide. The last section proposes the conceptual model of this research.

### 2.1 IT Governance

In this section, the context of IT governance especially the definitions and types of governance are highlighted. The structure and concept of IT governance and IT governance processes are covered including discussion about the IT governance best practice frameworks and the benefits.

#### 2.1.1 IT Governance Definition

The concept of IT governance has been emerged in the late 1990s with the main support by IT Governance Research Institute (De Haes & Van Grembergen, 2005). Since that time the demand to implement and improve IT governance has been concerned as a key issue by senior IT management across the world (De Haes & Van Grembergen, 2009). An understanding of the IT governance concept is important as it helps to gain a better view on the IT governance functions and the scope and boundary of IT governance. As IT governance literature stated a wide range of the definitions of IT governance, some IT governance definitions have been given in Table 2-1.

Table 2-1: Some Definitions of IT governance

| Researcher                            | IT Governance Definition   |
|---------------------------------------|--|
| Brown and Magill (1994)               | IT governance describes the locus of responsibility for IT function (C. V. Brown & Sharon, 1994).  |
| Luftman (1996)                        | IT governance is the degree to which the authority for making IT decisions is defined and shared among management, and the processes managers in both IT and business organizations apply in setting IT priorities and the allocation of IT resources (J. N. Luftman, 1996).   |
| Sambamurthy and Zmud (1999)           | IT governance refers to the pattern of authority for key IT activities (Sambamurthy & Zmud, 1999).   |
| Weill and Vitale (2001)               | IT governance describes a firm's overall process for sharing decision right about IT and monitoring the performance of IT investment (Weill & Vitale, 2001).   |
| IT Governance Institute (ITGI) (2003) | IT governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives. (ITGI, 2003). |
| Weill and Ross (2004)                 | IT governance is specifying the decision rights and accountability standard to encourage desirable behavior in using IT (Peter Weill & Jean W Ross, 2004).   |
| Van Grembergen (2004)                 | IT governance is the organizational capacity by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this   |

| Researcher      | IT Governance Definition  |
|-----------------|---|
|                 | way ensure the fusion of business and IT (W. Van Grembergen, 2004).   |
| Peterson (2004) | IT governance is the enterprise management system through which an organization's portfolio of IT systems is directed and controlled (Peterson, 2004a). |

The different definitions above show that there are various facets of IT governance. Some definitions focus more on the decision process. Meanwhile, some definitions highlight the relevancy of IT mechanism and propose IT governance framework. While there is no standard definition of IT governance and the available definitions differ considerably depending upon the researcher's intention and approach to the research topic. For example, Wessels and Loggerenberg (2006) reviewed many IT governance definitions and modified it to fit with his study that IT governance as a framework of IT-related processes, disciplined to deliver maximum IT. However, the common definition of IT governance is the achievement of business and IT link to gain effectiveness and efficiency and the responsibly of the board of directors.

This study focuses on IT governance processes, therefore, the definition by IT Governance Institute (ITGI, 2003), *"IT governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives"*, was adopted as a definition of IT governance in this study.

### 2.1.2 IT Governance Concept

The term of "Governance" has been used in many different contexts such as cooperate governance and IT governance. Governance is a process by which societies or organizations make their important decisions, determine whom involved in the process and how they take an account (Graham, Amos, & Plumptre, 2009). Good governance will align the goals of risk management and compliance with the

enterprise's overall business goals by fostering economic efficiency, innovation and adaptability (Shivashankarappa, Dharmalingam, Smalov, & Anbazhagan, 2012).

IT Governance is a subdomain of corporate governance (G. Ridley et al., 2004; Peter Weill & Jean W Ross, 2004). Corporate governance is defined as “a setting in which others can manage their tasks effectively” (Sohal & Fitzpatrick, 2002). The accountability of corporate governance are delegated to stakeholders and the public, defined by legislators and regulators and shared by boards, in some measure, with managers (Webb et al., 2006). It is explained as the system, by which companies are directed and managed, that influences how the objectives of the company are set and achieved, how risk is monitored and assessed, and how performance is optimized (Van Grembergen & DeHaes, 2007). Corporate governance is the combination of various specialized governance frameworks such as financial governance and IT governance that aim to create business value and building organizational transparency. IT Governance can be viewed as an integral part of corporate governance as shown in Figure 2-1 (Peter Weill & Jeanne W Ross, 2004).

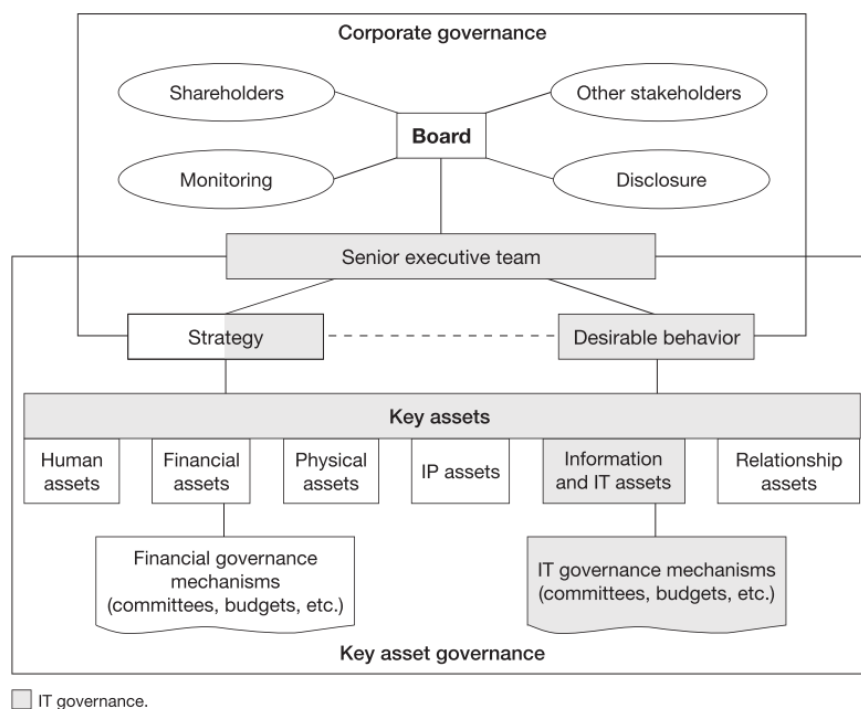


Figure 2-1: Corporate Governance and Key Asset Governance

IT governance focuses on the IT-related aspects that reflect a technical discipline by focusing on organizational alignment, integration and relationships of IT and business activities, performance, risk and compliance. Consequently, the key benefit of IT governance is to ensure that IT objectives aligned with organization's objective with enhancing organizational accountability and improve IT's return on investment (Patel, 2002). Implementation of IT governance is specific on the decision rights and monitoring the use of IT to contribute and enhance profitability that enable organization to ensure their transparency and directly support corporate governance.

IT governance achievement was established from an effective of IT management (De Haes & Van Grembergen, 2004). The principle of IT management is a discipline for managing information technology resources and more concern on daily IT operations and work routines (Cragg & Mills, 2009). The meaning of IT governance and IT management are related but not similar. Peterson (2004b) explained these two terms as "the domain of IT management focuses on the efficient and effective supply of IT services and products, and the management of IT operations, IT Governance faces the dual demand of (1) contributing to present business operations and performance, and (2) transforming and positioning IT for meeting future business challenges". The scope of IT governance seems much broader than IT management as it involves on performing and transforming IT to meet present and future demands of the business and its stakeholders. Although, IT governance and IT management was defined distinct from one another but in fact there are belong together (Van Grembergen & De Haes, 2005). Indeed, IT management is an integral part of IT governance process because IT governance involves with high level of decision making to define policy and procedure while IT management focuses on the current operational aspects to serve IT governance's policy (Sohal & Fitzpatrick, 2002).

IT Governance Institute (ITGI) defined five areas of IT governance principle including: strategic alignment, value delivery, risk management, resource management and performance measurement (ITGI, 2003). Each area has specific viewpoint and purpose as shown in Figure 2-2.



Figure 2-2: Five area of IT governance principle

The first area, strategic alignment, focuses on aligning between IT and business. This area aims to maximize opportunities for the business use of IT while providing transparency and assurance that IT objectives are being achieved. The second area, value delivery, concentrates on optimizing expenses and proving the value of IT. The third area, risk management, addresses the safeguard of IT such as legal, regulatory, compliance needs and aims to manage key operational risks such as disaster recovery and continuity of operations. The fourth area, resource management, realizes to optimal investment and proper management of critical IT resources to appropriately align with business needs. The last area, performance measurement, aims to utilize real-time data to continuously improve IT delivery and performance. These focus areas present as a main principle of IT governance and led to accomplish two key elements in IT governance that are IT's delivery of value to the business and mitigation of IT risks (Van Grembergen, De Haes, & Guldentops, 2004).

Besides, the principle of IT governance was explained in ISO/IEC 38500, an international standard for corporate governance of information technology published by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). This standard provides a high level principles based advisory standard for effective governance of IT. The purpose of this standard is to

promote effective, efficient, and acceptable use of IT in all organizations. It defines three main tasks (Evaluate, Direct and Monitor) as shown in Figure 2-3 (ISO/IEC, 2008).

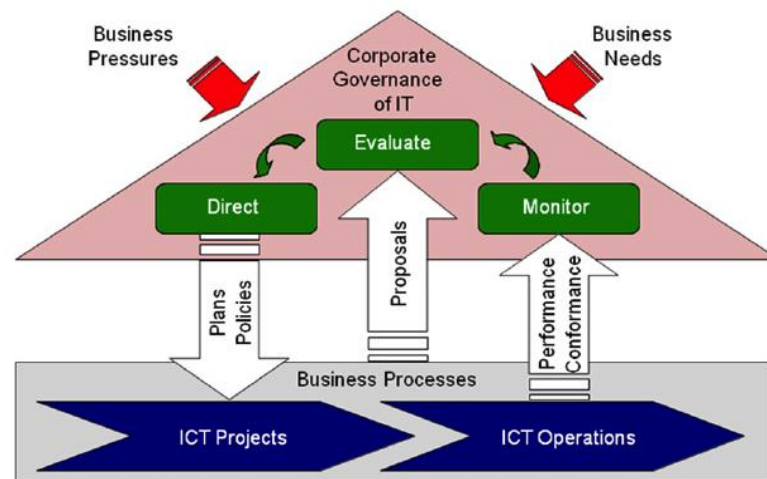


Figure 2-3: Model for Corporate Governance of IT

This model is used for providing broad guidance on the role of a governing body that encourages organizations to use appropriate standards to underpin their governance of IT. The first task is evaluating the current and future use of IT. The second task, direct, is preparing and implementing plans and policies to ensure the usage of IT meets business objectives. The last task, monitor, is the conformance of policies and performance against the plans.

Another perspective about IT governance concept was studied by Peter Weill and Jean W Ross (2004), they assigned five major decision-making domains for IT governance—which are IT principles, IT infrastructure, IT architecture, business application needs, and IT investment and prioritization as shown in Table 2-2.

Table 2-2: IT Governance Decision-making Domains

| Decision-making Domain       | Description   |
|------------------------------|---|
| IT principles                | High level statements about how IT is used in the business.                                       |
| IT infrastructure strategies | Strategies for the base foundation of budgeted-for IT capacity (both technical and human), shared |



| Decision-making Domain           | Description   |
|----------------------------------|---|
|                                  | throughout the firms as reliable services, and centrally coordinated (for example, network, help desk, shared data).  |
| IT architecture                  | An integrated set of technical choices to guide the organization in satisfying business needs. The architecture is a set of policies and rules that govern the use of IT and plot the migration path to the way business will be done (including data, technology and application). |
| Business application needs       | Business application to be acquired and build.  |
| IT investment and prioritization | Decision about how much and where to invest in IT including project approval and justification technique.   |

The first domain, IT principles, is high-level statements about how IT is used in the firm. The second domain, IT infrastructure, describes the approach to building the IT foundation. The third domain, IT architecture, provides an integrated set of technical choices to guide the organization in satisfying business needs. The fourth domain, Business application needs, indicates the needs and requirements to meet business practices and operations. Last domain, IT investment and prioritization, covers the whole decision-making process of IT investment. It is obvious that these five domains describe the specific area about decision-making in IT governance.

In overall, IT governance is an integral part of enterprise governance and consists of the leadership and organizational structures and processes necessary to ensure that the organization's IT sustains and extends the organization's strategies and objectives (ITGI, 2003). After IT governance concept was emerged in the late 1990s with main support from the IT Governance Research Institute (ITGI), the demand to implement and to improve IT governance has become a key issue for senior IT

executives across the world (De Haes & Van Grembergen, 2008a). The adoption of IT governance has several benefits that will be discussed in following section.

### 2.1.3 IT Governance Benefits

There are many studies about the outcome of IT governance adoption that revealed the benefit of IT governance adoption, for example, ensures efficiency, reduces costs, and increases control of IT (Van Grembergen, De Haes, & Amelinckx, 2003). Organizations adopt IT governance in order to improve organizational accountability, which results in higher returns on IT investments (Patel, 2002). A study by Weill and Woodham (2002) also found that organizations increased their returns on IT investment as much as 40%, with the help of well-organized IT governance, and companies with better IT governance earned at least 20% higher returns. Accordingly, other studies found that IT governance is critical to achieving corporate success by providing information through the application of technology (Korac-Kakabadse & Kakabadse, 2001) and that it can help an organization ensure business-IT alignment through an appropriate level of IT control (Van Grembergen et al., 2004). Organizations implement IT governance in order to ensure the strategic alignment between IT and business (Ko & Fink, 2010).

Business-IT alignment is an important issue in the IT management literature. Previous scholars found that the benefits of accomplishing business-IT alignment include, for instance, escalating business performance (Bergeron et al., 2004; Y. E. Chan et al., 2006; Cragg et al., 2002) and providing competitive advantage for the organization (Bharadwaj, 2000). The literature also suggested that IT governance adoption is a key factor in achieving business-IT alignment and in expanding business value creation (De Haes & Van Grembergen, 2015).

Besides, the benefit of IT governance has been explored by taken several research approaches used both qualitative and quantitative methods (Mauricio Marrone, Hoffmann, & Kolbe, 2010; Potgieter, Botha, & Lew, 2005). The positive benefit ranged from increased flexibility and adaptability of IT services, clarity of expectations of IT staff, cost justification of IT infrastructure and IT services, and improved quality of

business operations (Gacenga, Cater-Steel, & Toleman, 2010). IT governance directly influences the benefits generated by organization IT investment (Weill, 2004). Moreover, good IT governance is not a “nice to have” but it is a “must have” as it can contribute to higher return on assets when businesses increase their IT investment (Webb et al., 2006). As a result, IT governance should be considered to adopt and implement in the organizations in order to ensure right decisions making on IT investment, to monitor organizational capacity, and to formulate the IT strategy for aligning of IT and business.

#### 2.1.4 IT Governance Process

The term of IT governance processes was defined as “formal processes for ensuring that daily behaviors are consistent with IT Policies and provides input back to decisions including the IT investment proposal and evaluation processes, architecture exception processes, service-level agreements, chargeback, and metrics.” (Peter Weill & Jean W Ross, 2004). In a study about IT governance implementation by Van Grembergen et al. (2004), they explained a holistic approach of IT governance deployment using a mixture of three essential elements which were structure, process, and relational mechanism (Peterson, 2004b). They claimed that there was no standard for designing IT governance for organization and it is contingent upon the integration strategy of these three elements. Their study also provided an overview of mechanisms that can support IT Governance as show in

Table 2-3.



Table 2-3: Structures, Processes and Relational Mechanisms for IT Governance

| Integration strategy | Structures   | Processes  | Relational mechanisms   |  |
|----------------------|--|--|---|--|
| <b>Tactics</b>       | IT Executives & accounts   | Strategic IT decision-making   | Stakeholder participation   | Strategic dialogue   |
|                      | Committees & councils  | Strategic IT monitoring  | Business-IT partnerships  | Shared learning  |
| <b>Mechanisms</b>    | <ul style="list-style-type: none"> <li>- roles and responsibilities</li> <li>- IT strategy committee</li> <li>- IT steering committee</li> <li>- IT organisation structure</li> <li>- CIO on Board</li> <li>- project steering committees</li> <li>- e-business advisory board</li> <li>- e-business task force</li> </ul> | <ul style="list-style-type: none"> <li>-Balanced (IT) scorecards</li> <li>-Strategic Information Systems Planning</li> <li>- COBIT and ITIL</li> <li>- Service Level Agreements</li> <li>-Information economics</li> <li>- Strategic Alignment Model</li> <li>- Business/IT alignment models</li> <li>- IT Governance maturity models</li> </ul> | <ul style="list-style-type: none"> <li>-Active participation by principle stakeholders</li> <li>-Collaboration between principle stakeholders</li> <li>-Partnership rewards and incentives</li> <li>-Business/IT co-location</li> </ul> | <ul style="list-style-type: none"> <li>-Shared understanding of business/IT objectives</li> <li>-Active conflict resolution ('non-avoidance')</li> <li>-Cross-functional business/IT training</li> <li>-Cross-functional business/IT job rotation</li> </ul> |

Based on their study, structure was defined as “structural (formal) devices and mechanisms for connecting and enabling horizontal, or liaison, contacts between business and IT management (decision-making) functions” that include the existence of the clear roles and responsibilities and involve with the governance process that provides enabling mechanisms to facilitate contact between IT and the board of directors. The second elements, processes, are defined as “formalization and institutionalization of strategic IT decision making or IT monitoring procedures” that refer to strategic decision making and the use of various performance monitoring tools such as COBIT, ITIL (Information Technology Infrastructure Library), (IT) Balanced Scorecard. The last element, relational mechanisms, refers to “the active participation of, and collaborative relationship among, corporate executives, IT management, and business management” that includes relationship and or collaboration among business and IT group. IT governance can be deployed by using a mixture of these elements in order to ensure that business and IT objectives are aligned and a relationship between three IT governance elements is provided in Figure 2-4 (Van Grembergen et al., 2004).

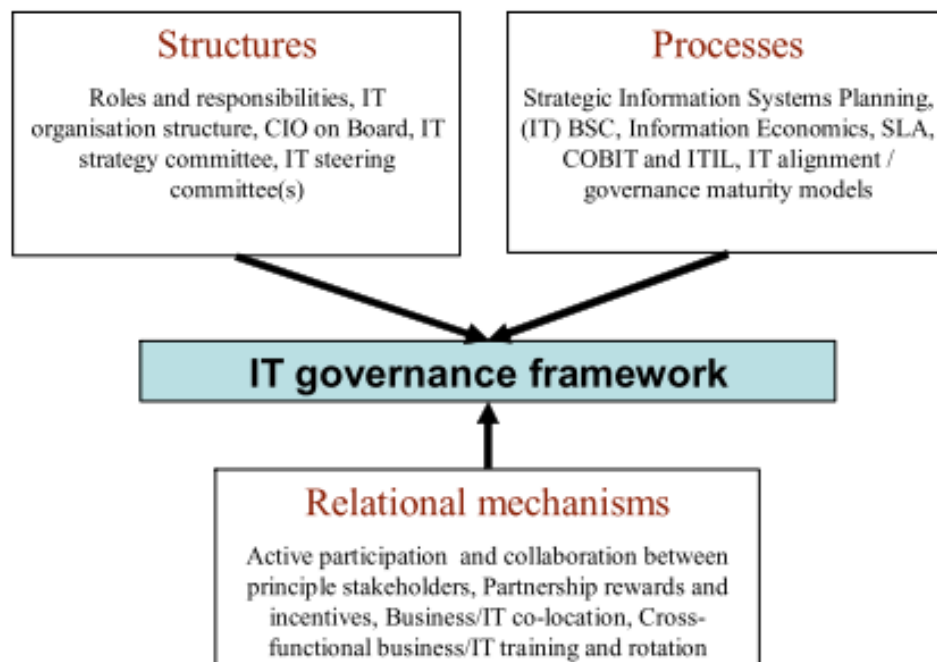


Figure 2-4: Relationship of IT Governance Elements

According to a study by De Haes and Van Grembergen (2008b), they explored effectiveness and ease of implementation for all these elements (structures, processes and relational mechanisms) and the finding showed that structures and processes were in general perceived as being equally effective but IT governance processes are perceived as being harder to implement when compared with IT governance structures. However, the adoption and implementation of IT governance processes can help organization to ensure their strategic alignment between IT and business (Ko & Fink, 2010). Furthermore, a set of IT governance processes can enable the provision of information needed by organization in order to achieve its goals (Webb et al., 2006). It is necessary to carefully select appropriate IT processes because they affect management of organizational and IT resources.

According to prior studies by Van Grembergen et al. (2004), they defined IT governance processes as a necessary element involves with strategic decision making and the use of various performance monitoring frameworks and tools such as Strategic Information Systems Planning, COBIT, ITIL, Balanced Scorecard, Information Economics and others. The other study by Romero (2011) also listed ten IT governance processes, namely Integrated business and IT planning; Architecture management; IT investment

assessment; IT financial and resource allocation; Project execution and decision-making; Emerging technology evaluation and adoption; Client relationship management; building and maintaining applications/infrastructure; provisioning of IT Services; and Strategic Sourcing Services, that are an enable of IT governance decision. These ten processes are technical in nature and are considered in IT governance frameworks such as COBIT and ITIL.

With regard to IT governance, there are a variety of international standards, frameworks, reference models, and proprietary methods, which are often referred to as “best practices framework.” During the last two decades, a number of best practice frameworks have been developed to encourage effective IT governance and to help organizations improve their accountability and manage their IT operations (Larsen, Pedersen, & Viborg Andersen, 2006). Currently, there are many best practice frameworks that provide processes and controls to encourage effective IT governance, for example, ITIL, TOGAF, ISO/IEC38500, and COBIT. Many companies have used one or more of these frameworks to improve their management and governance of IT.

The key benefits that organizations expect from these IT governance best practice frameworks implementation are the alignment of IT services with current and probable future business needs, improved quality of IT services, and reduced long term costs of service provision (Peak, Guynes, & Kroon, 2005). There are many best practice frameworks related to IT governance as shown in Figure 2-5 (Cater-Steel & Tan, 2005).

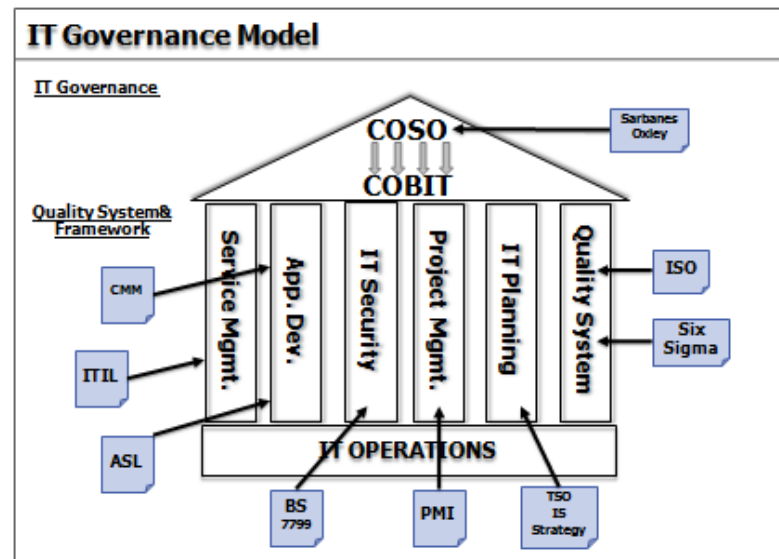


Figure 2-5: Frameworks related to IT Governance (Adapt from Radcliffe, 2004)

Numerous IT governance best practice frameworks have been developed to provide guidelines and best practices to IT industry. The growing adoption of IT governance best practice frameworks is increasing due to the requirements to better manage the quality and reliability of the IT utilizations in organizations as well as to response to a growing number of regulatory and contractual requirements. The existing IT governance best practice frameworks vary depending on the focus areas. The high level classification of IT governance frameworks shows in Figure 2-6 (Looso, Goeken, & Johannsen, 2010). It shows that some best practice frameworks are broader than other while some only cover specific aspects of IT, such as security, management of risk, or procurement and there are overlapping among best practice frameworks. It is also true that there is no one IT government best practice framework that can cover all areas and fits for all organization's requirements.



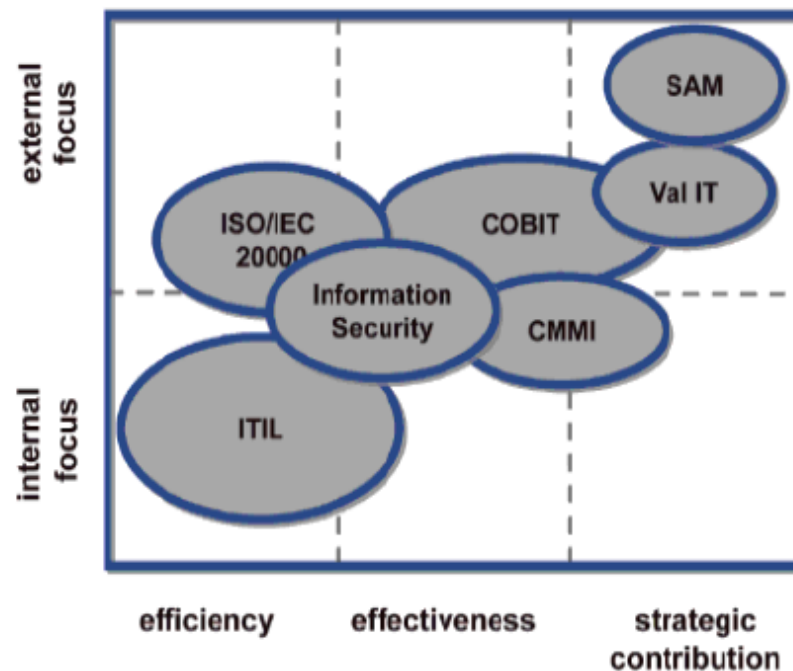


Figure 2-6: High Level Classification of IT Governance Frameworks

Many companies have implemented IT governance best practice frameworks to improve their management and governance of IT. Adoption of IT best practice frameworks can be an alternative for organizations to find the right balance between the appropriate IT governance processes that are proposed by the frameworks and their business processes. There are some widely adopted IT governance best practice frameworks and standards which have received significant attention from several organizations worldwide. The widely used best practice IT governance frameworks in is COBIT (G. Ridley et al., 2004). The other broadly acceptable best practice with particularly focuses in IT service is ITIL (Năstase, Năstase, & Ionescu, 2009; Nick, 2005; Young, 2004).

ITIL is defined as the best practice for an organization's IT processes and it was established in 1989 by the United Kingdom's former Central Computer and Telecommunications Agency (CCTA) to improve its IT organization. Currently, ITIL is managed by the UK's Office of Government Commerce (OGC) and is supported by the IT Service Management Forum (itSMF). It provides a set of good practices in IT service management, process definitions and descriptions for the entire IT function and service

delivery that intend to enable organizations to deliver appropriate services and continually ensure that their delivering benefits meet with their business goals.

The current version is ITILv3 and its subsequent refinement from ITIL2011. It aims to improve better use of IT resources and services by based on a lifecycle model which covers five core stages of IT services which are service strategy, service design, service transition, service operation and continual service improvement as presented in Figure 2-7 (Cartlidge et al., 2007).



Figure 2-7: ITIL Service Life Cycle

According to ITIL publication, each stage of ITIL is published as a separate ITIL book, provides guidance to organizations on how to define, evaluate and improve IT service quality. The five core stages of ITIL service life cycle beginning with identification and developing driver of IT requirement (Service Strategy), through to the design (Service design) and transfer a new and changed services (Service Transition) into operation (Service Operation) and, finally, on to the monitoring and improvement phase of the service (Continual Service Improvement) (Taylor, Iqbal, & Nieves, 2007). The guidance in ITIL provides the principles underpinning the practice of service management that are useful for developing service management policies,

guidelines and processes across the ITIL service life cycle and can be adapted for use in various business environments and organizational strategies. ITIL provides 26 key IT processes defined by each lifecycle stage as depicted in Figure 2-8.

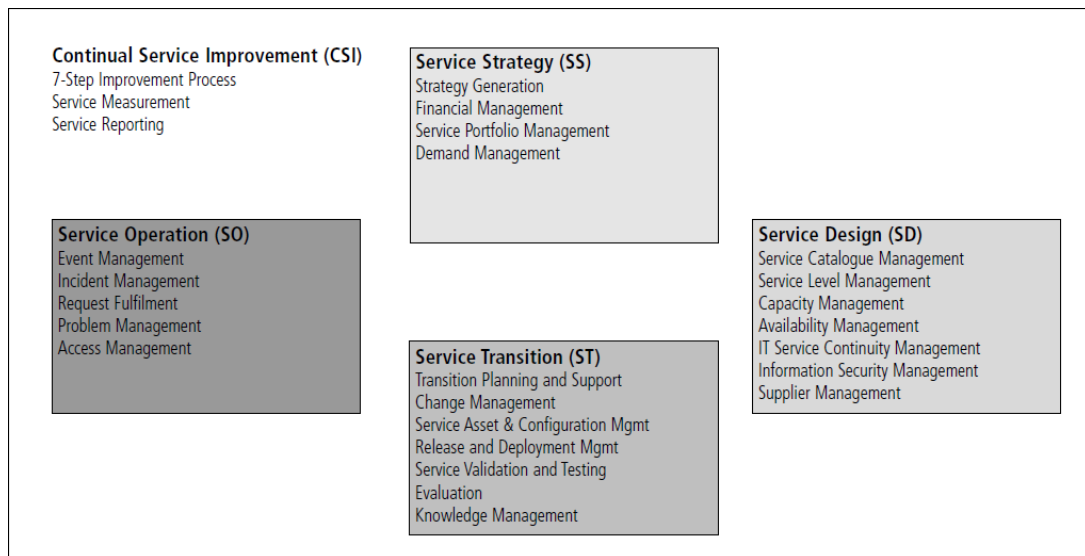


Figure 2-8: ITIL v3 Service Management Processes

As a guideline for IT service management and service delivery processes, ITIL provides many processes but it is not necessary to implement all processes, not even have to implement in repetitive order. Many large international organizations have implemented ITIL and have reported great success. For example, there is an empirical evidence found that companies that were highly mature in the ITIL implementation were also highly aligned business and IT of organizations (M Marrone & Kolbe, 2010).

The other widely acceptable best practice framework for IT governance is COBIT-(G. Ridley et al., 2004). In 1996, COBIT was originally designed by the Information System Audit and Control Association (ISACA) to support IT governance in managing and understanding the risks and benefits associated with information and related technology. At present, COBIT is in its 5th edition, which was released in 2012. COBIT5 is based on five key principles as shown Figure 2-9 (ISACA, 2012a).

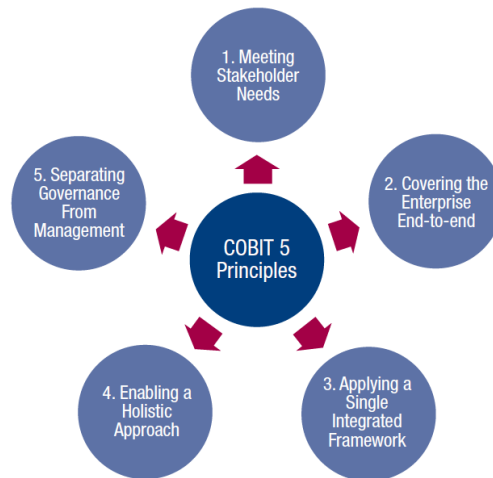


Figure 2-9: COBIT5 Principles

Five key principles of COBIT 5 framework are meeting stakeholder needs, covering the enterprise end-to-to, applying single integrated framework, enabling a holistic approach and separating governance from management. The primary focus of COBIT is on aligning IT and business in order to maximize benefits from the use of IT. COBIT is focused on the management and monitoring IT processes which is including of five domains that break to 37 processes. COBIT5 process reference model is presented in Figure 2-10 (ISACA, 2012b).

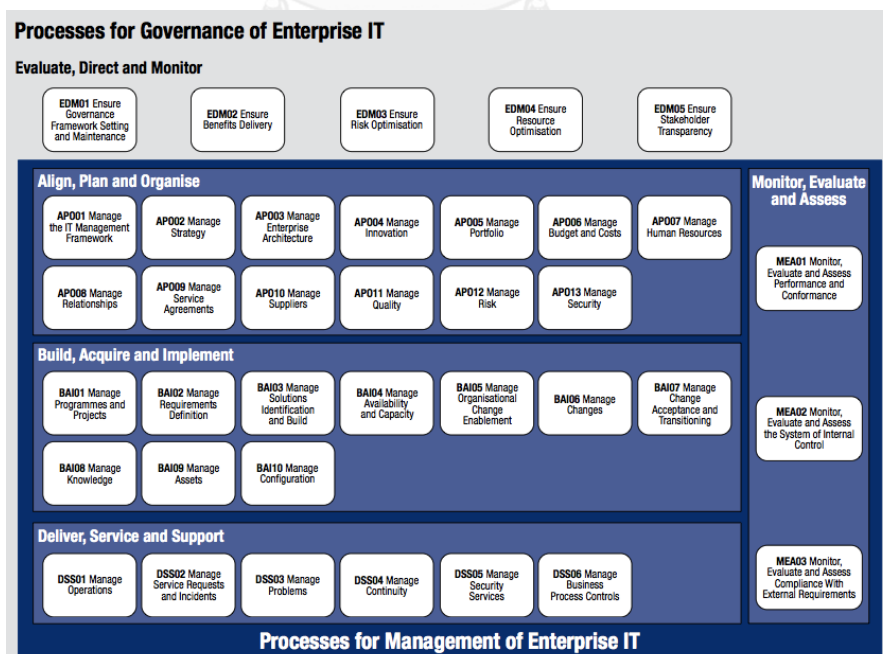


Figure 2-10: COBIT5 Process Reference Model

COBIT5 divides IT governance into five domains (Evaluate, Direct and Monitor (EDM); Align, Plan and Organize (APO); Build, Acquire and Implement (BAI); Deliver, Service and Support (DSS); Monitor, Evaluate and Assess (MEA)) which are fell into 37 IT processes. These processes guide how to optimal use IT resources responsibly and how to ensure that IT risks are managed and mitigated to achieve enterprise goals.

The first domain, EDM, contains with five processes, emphasizes to help an enterprise to ensure that its objectives are achieved by evaluating stakeholder needs and conditions, setting direction through prioritization and decision making, and monitoring performance and compliance with direction and objectives. The second domain, APO, contains with thirteen processes, focuses how to plan and generate the most benefits from the use of IT in a company to achieve the enterprise's goals and objectives. The third domain, BAI, contains with ten processes, covers how to identify IT requirements, acquire the technology, and implement it to support business processes. The forth domain, DSS contains with six processes, covers on the delivery phase of IT to make sure that IT systems are at their most effective and efficient performance. The last domain, MEA, contains with three processes, highlights the area of IT control and IT compliance with regulatory requirements including monitor and assess the effectiveness of IT system to meet business objectives and the company's control processes by internal and external auditors.

In addition, five domains of COBIT5 align with other relevant international standards and frameworks at a high level, and thus can serve as the overarching framework for governance and management of enterprise IT (ISACA, 2012a). Figure 2-11 depicts the relative coverage between COBIT5 and the other standards and frameworks.

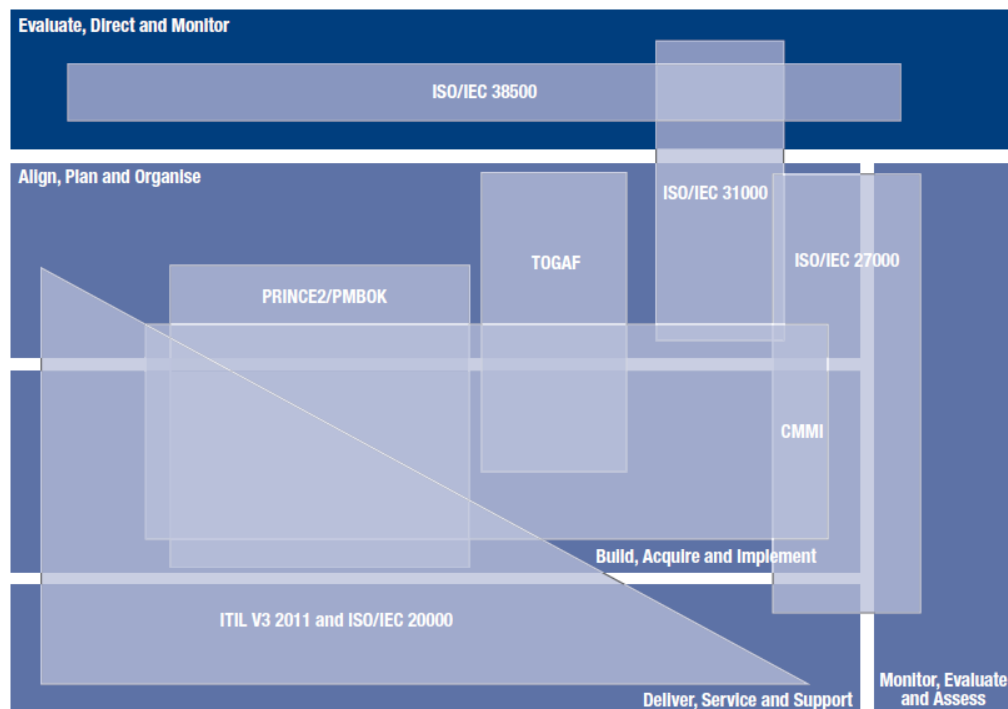


Figure 2-11: COBIT5 coverage of other standards and frameworks

COBIT 5 covers all processes and functions that are required to govern and manage enterprise. It is an IT governance framework with a globally accepted set of tools that executives and IT professionals can use to ensure that IT operations are aligned with business goals and objectives (Colbert & Bowen, 1996). For this reason, COBIT is accepted as a highly successful tool for the auditors since many large audit firms adopted audit checklists and internal control objectives of COBIT to correspond with the international standard (Payne, 2003). It seems to be becoming an influential framework for the control and governance as it has been utilized and implemented in many diversity of the organization countries across the world (Guldentops, Van Grembergen, & De Haes, 2002; John, 2001).

In reviewing the literature, there are studies of the relationship between COBIT and business-IT alignment. De Haes and Grembergen (2009) explored the impact on business-IT alignment through the maturity level of COBIT's IT governance processes and found a positive relationship between IT governance maturity levels and business-IT alignment. Another study showed that the implementation of COBIT would increase the business-IT alignment and realized perception of the benefits

(Mauricio Marrone et al., 2010). These findings imply that adoption of IT governance processes from best practice frameworks like COBIT might have a greater impact on business-IT alignment. In 2008 a global survey on IT governance conducted by IT Governance Institute, the findings result revealed that more than 50% of various CEOs and CIOs in 23 countries are aware of the benefits offered by IT governance frameworks such as COBIT, but only 30% of them had any intention of implementing such a framework (ITGI, 2008). Although COBIT provides a best framework that cover many important internal standards and direction to IT governance, it hardly defines the implementation details because it has a massive information covering more than 300 control objectives and 37 IT governance processes that is time consuming and resource intensive to implement.

The importance and many benefits of IT governance process adoption had been suggested in past literature. For instance, IT governance can produce business profitability growth (Peter Weill & Jeanne W Ross, 2004) and increase operational efficiency and improve business performance (Gacenga et al., 2010). IT governance process implementation can leverage the alignment of an organization's IT operations with its business strategies (Wessels & Loggerenberg, 2006). To cover all points of IT governance, organizations should adopt all the IT governance processes from best practice framework. However, IT governance process implementation is uneasy as it appears to be; it requires a lot of effort and resources to implement.

In 2012, the author conducted a survey to obtain data on the adoption of the IT governance framework from companies listed on the Stock Exchange of Thailand (SET) and found that only 20% of respondents (46 of 229 companies) had adopted the IT governance framework (Samithisomboon & Chantatub, 2013). The reason why many companies had not applied an IT governance framework because of unfamiliar and not understand of IT governance framework. The similar results were found from a study by Winniford, Conger, and Erickson-Harris (2009) which indicated the main obstacle to the adoption of IT governance was insufficient information about the IT governance framework. Afterward in 2013, the author conducted another an online survey with organizations in Thailand to investigate the maturity of implementation of

IT governance processes from COBIT5. The results showed that only 37% of the respondents had fully adopted the IT governance process and that 86% of them encountered problems in selecting appropriate processes (Samithisomboon & Chantatub, 2014). Despite IT governance process implement is important and can return many beneficial, it has not been extensively adopted by businesses in Thailand. Moreover, a large number of organizations still encounter obstacles and struggle to select appropriate IT governance processes. It appears that organizations need a guideline to help them to find the answer to what are the IT governance processes they should select that can help them to gain maximum benefit and beyond to achieve better alignment between IT and business. The consecutive section will discuss more details about a key of IT governance adoption which is business-IT alignment.

To conclude with, previous researches indicate a distinct concept of IT governance that can help organization to make a right decision of IT. It also helps to achieve effective and efficient management of IT. Moreover, literature review expresses many benefit outcomes and advantages that can return from IT governance implementation. In order to gain these benefits, there are many best practices, frameworks and international standards which were developed to support organization to implement IT governance by providing many IT governance processes. However, adoption of all IT governance processes at once is ideal because it requires a lot of effort and resources to implement. Therefore, it is important for organization to carefully select appropriate IT processes to fit with their environment and requirements. In past researches mostly study IT governance during and post implementation stage. It is limited of study that focuses on the initial stage before implementation stage. To gain a better understanding on how to select the best fit IT governance process, this study aims to study at the preliminary stage of IT governance process selection.

## **2.2 Business-IT Alignment**

A key benefit of IT governance adoption is in achieving business-IT alignment and in expanding business value creation (De Haes & Van Grembergen, 2015).



This section reviews the prominent business-IT alignment researches focused on definition, model, assessment and benefit of business-IT alignment.

### 2.2.1 Business-IT Alignment Definition

Alignment of IT with business objectives is an important issue in IT management literature. The subject has been addressed by many conceptualizations and empirical methods (Niederman, Brancheau, & Wetherbe, 1991). Henderson and Venkatraman (1993) defined business-IT alignment as the degree of fitness and integration between business strategy, IT strategy, business infrastructure, and IT infrastructure. Silviu (2007) depicted it as *“the amount to which the IT applications, infrastructure and organization, the business strategy and processes enables and shapes, as well as the process to realize this.”* Whereas Reich and Benbasat (1996) stated that Business-IT alignment is *“the degree to which the mission, objectives, and plans contained in the business strategy are shared and supported by the IT strategy”*. Moreover, (James D McKeen & Smith, 2003) extended this definition to identify that strategic alignment of IT exists when an organization’s goals and activities and the information systems that support them remain in harmony. While these definitions have been defined differently in some aspects, among of them point to the same main common concept that is how to manage IT to fully support business strategies and processes for harmonizing business and IT domain with their objectives, strategies and decision making.

The term business-IT alignment is commonly used to refer to the IT performance impacts of business including enable organizations to derive value from IT investment as a basic principle that IT should be managed in a way that reflects management of the business (Kuruzovich, Bassellier, & Sambamurthy, 2012). Additionally, Luftman et al. (1999) depicted that the good alignment means that the organization is applying appropriate IT in given situations in a timely way, and that these actions stay congruent with the business strategy, goals, and needs. As this research aims to explore IT governance processes selection factors that support business-IT alignment, this study will adhere with the definition by Henderson and Venkatraman (1993) that business-IT alignment as the degree of fitness and integration

among business strategy, IT strategy, business infrastructure, and IT. This definition focuses on relationship in harmony way between IT and business.

### 2.2.2 Business-IT Alignment Model

The underlying idea of IT governance consists of five principles including strategic alignment, value delivery, risk management, resource management, and performance measurement. Strategic alignment is a concept of business-IT alignment. According to previous findings, there have been an evidence that governance processes play an important role in driving overall IT alignment (C. V. Brown & Bostrom, 1994; De Haes & Van Grembergen, 2009; Reich & Benbasat, 2000). As the alignment of IT with the business objective is considered an important element of IT governance, there are many conceptual models of business-IT alignment proposed in the academic literature.

The first model introduced by MIT (Massachusetts Institute of Technology) is “MIT Alignment Model”. It expresses that revolutionary change involving IT investment can bring about substantial rewards as long as the key elements of strategy, technology, structure, management processes and individuals and roles are kept in alignment (Morton, 1991). Then, Henderson and Venkatraman (1992) were influenced by the MIT research in their creation of the Strategic Alignment Model (SAM). In 1993 they proposed the “Strategic Alignment Model (SAM)” that emphasizes the interrelationship between an enterprise’s business, IT strategy and IT infrastructure as presented in Figure 2-12.

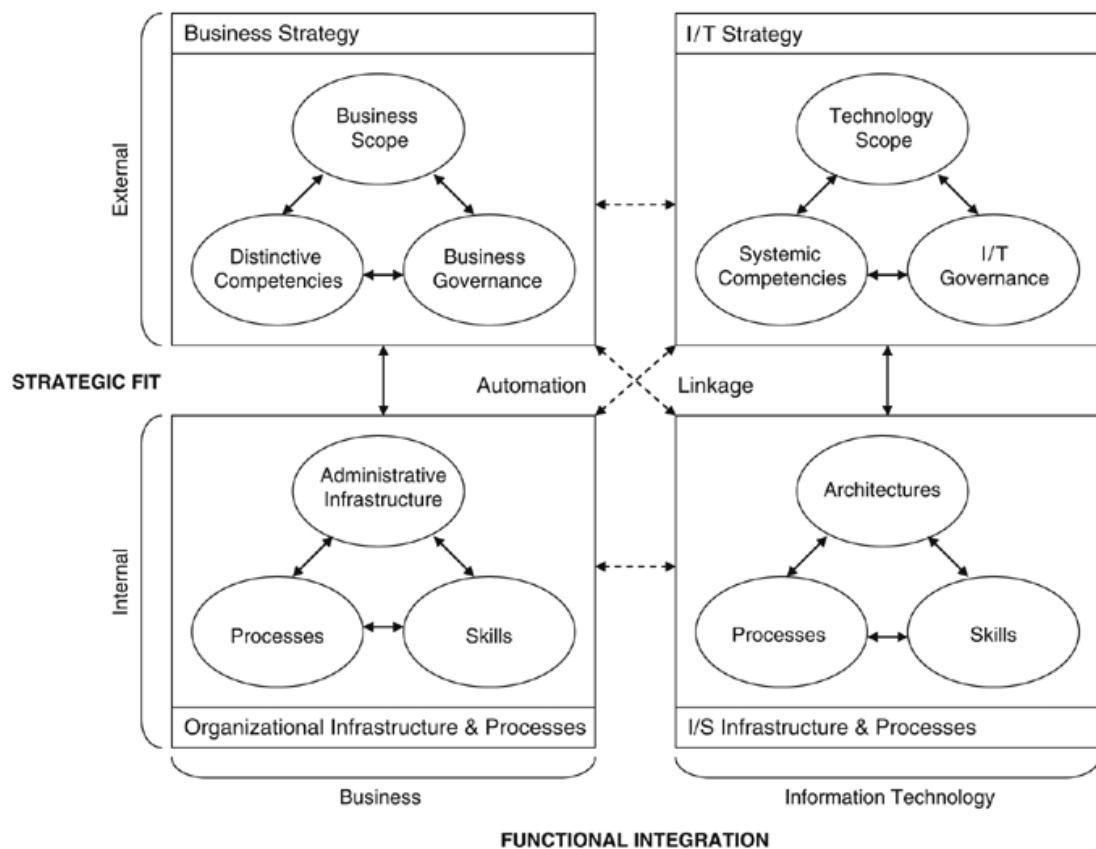


Figure 2-12 : Strategic Alignment Model (SAM)

The Strategic Alignment Model (SAM) is based on four fundamental domains which are business strategy, organizational infrastructure and processes, IT strategy, and IT infrastructure and processes. Each domain composes of three components linked together. Moreover, the model suggests two viewpoints, functional integration and strategic fit. The vertical linkage (strategic fit) refers to the use of strategy to determine the infrastructure of the business while the horizontal linkage (functional integration) is related to the alignment of business and IT.

Although the SAM model clearly recognizes the need for continual alignment but it does not touch on how to select IT governance processes that should be implemented. Several scholars have built on and extended the SAM model. For example, Avison, Jones, Powell, and Wilson (2004) extended the SAM model by producing a framework that incorporates additional functional and strategic layers, Yolande E Chan and Reich (2007) added to the SAM model by providing managers and researchers with additional practical ways to attain alignment. The Strategic Alignment

Model (SAM) of Henderson and Venkatraman (1999) is a widely used business-IT alignment theory; it is the most widely cited among all alignment models because it addresses the required balance between business strategies, IT strategies, business processes, and IT processes (Van Grembergen et al., 2004).

As business-IT alignment concept has been accepted and developed to help organization to measure business and IT alignment, there are some significant assessing models appear in literature. In 1989, Venkatraman developed instrument to assess the linkage between business and IT namely STROBE (Strategic Orientation of Business Enterprises) (Henderson & Venkatraman, 1992). Afterward, Yolande E. Chan et al. (1997) created another instrument for assessing the alignment of business strategy and IT strategy by extending from the STROBE which is STROIS (Strategic Orientation of IS). Figure 2-13 presents the detailed dimensions of STROIS and STROBE (De Haes, 2007).

| <b><i>STROBE</i></b>           | <b><i>STROIS</i></b>                  |
|--------------------------------|---------------------------------------|
| Company Aggressiveness         | IS Support for Aggressiveness         |
| Company analysis               | IS Support for analysis               |
| Company internal defensiveness | IS Support for internal defensiveness |
| Company external defensiveness | IS Support for external defensiveness |
| Company futurity               | IS Support for futurity               |
| Company proactiveness          | IS Support for proactiveness          |
| Company risk aversion          | IS Support for risk aversion          |
| Company innovativeness         | IS Support for innovativeness         |

Figure 2-13: Dimensions of STROIS and STROBE

Burn and Szeto (2000) provided empirical support for modeling IT strategic alignment using a combination of STROBE and STROIS and the empirical results indicate that business strategic orientation and IS strategic alignment have positive impacts on business performance. Moreover, Luftman (2000) developed the strategic alignment maturity model in order to help companies to improve their strategic alignment capability and align their IT capabilities with the business to ensure that IT delivers business value. There are six criteria, which are communications,

competency/value measurements, governance, partnership, technology scope and skills, for assessing business-IT alignment with both business and IT executives' evaluation. Each criteria provides evaluating alignment practices and maturity model of the practices ranged from level 1 to 5 as a benchmarking tool. The strategic alignment maturity model is presented in Figure 2-14.

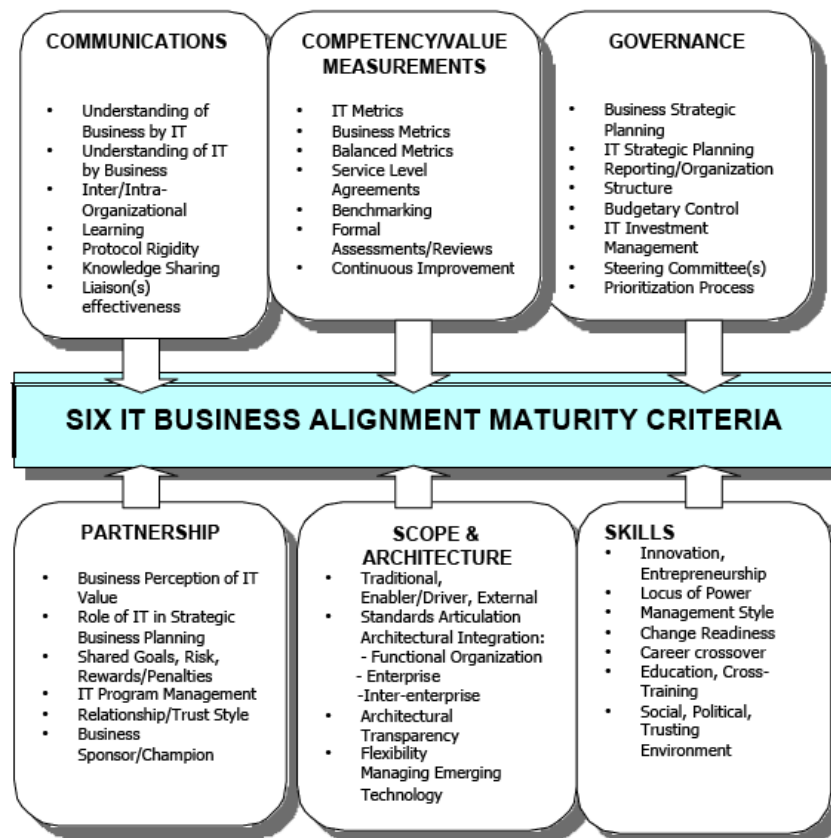


Figure 2-14: Criteria for Assessing Business/IT Strategic Alignment Maturity

This maturity model was tested against 500 global companies from the Fortune 1000 companies and the finding revealed that there was a significant relationship between strategic alignment maturity level and business performance (J. Luftman, 2003). Afterward, this approach has been well accepted to measure the alignment of business and IT (Belfo & Sousa, 2012; Kuruzovich et al., 2012). This approach had been applied to implement business and IT strategic alignment and it appeared that organizations that leverage power of IT to influence business strategy

appear to be better alignment than the organizations that use IT as a support activity (Avison et al., 2004; Yolande E Chan, 2002).

### 2.2.3 Business-IT Alignment Benefit

Business-IT alignment issue was addressed in several researches as mentioned above that numerous instruments and tools were proposed to assess the link between business and IT. The Society for Information Management (SIM) in a joint effort with other research leaders conducted an annual survey of the key issues facing IT executives globally and found that the business-IT alignment issue had been in the top three management concerns since 2003 (J. Luftman & Derksen, 2012). This fact demonstrates that IT executives place emphasis on the need to align IT strategies with business in order to advance the organization.

Since Luftman (2000) proposed the strategic alignment maturity (SAM) model, many studies on relationship between strategic alignment and business performance were carried on and the results confirmed that the higher strategic alignment levels, the greater business performance. Consequently, the outcomes from harmonizing of business and IT have been studied in various perspectives, for example, some study emphasized on the linking between business plan and the IT plan (G. S. Kearns & Lederer, 2000), and some studies focus on the ensuring congruence between the business strategy and the IT strategy (Henderson & Sifonis, 1988). The another perspective is to concentrate on business performance and IT performance (Grover S Kearns & Lederer, 2003).

Previous research found that the benefits of accomplishing business-IT alignment include, for instance, escalating business performance (Bergeron et al., 2004; Cragg et al., 2002) and providing competitive advantage for the organization (G. S. Kearns & Lederer, 2000). Besides, business-IT alignment benefit does not only ensure successful in business performance but also improve business outcomes such as increasing sales growth (Nash, 2006). The result of business-IT alignment is significantly correlated with perceived business performance (Byrd & Davidson, 2006; Sabherwal & Chan, 2001) and leads to increased profits for an organization (Yolande E. Chan et al.,

1997). In addition, effective alignment of the IT plan with the business plan can provide competitive advantage for organization (G. S. Kearns & Lederer, 2000). Furthermore, another benefit of business-IT alignment is maximizing the return on IT investment (Bharadwaj, 2000). It can indicate that business and IT performance are strongly coupled, and organizations cannot be competitive and sustainable if their business and IT strategies are not aligned.

As nowadays business environment is changing dynamically, IT has to conform with change so quickly to support business transformation (J. Luftman & Brier, 1999). Additionally, the appropriate alignment between the use of IT and the business goals that are is viewed as enhancing efficient and effective IT governance of organization (Gail Ridley, Young, & Carroll, 2008). The literature also suggests that effective way to achieve and sustain business-IT alignment is setting up IT governance for harmonious relationship between these two sides and a more streamlined business plan (De Haes & Van Grembergen, 2015). However, previous researches still lack of study that focuses on how to select the appropriate IT governance processes to achieve the business-IT alignment.

### **2.3 The Contingency Theory**

To motivate the selection of IT governance processes from contingency perspective, this section begins by summarizing evolution of contingency theory. Then, it explains the concept of contingency theory in MIS and presents a brief review of contingency variable research in IT governance domain.

#### **2.3.1 Evolution of Contingency Theory**

In 1950s, contingency theory was first introduced as a management theory to analyze the optimal structure of an organization (Weill & Margrethe, 1989). It was initial developed base on the idea that there is no single best way of organizing a corporation, leading a company or making a decision because it depends on environment (Fiedler, 1964). That means an organizational or leadership style is effective in some situations may not be successful in others because each organization has different setting. Szilagyi and Wallace (1980) summarized a simple model of

contingency approach that is formed to understand the interrelationship among organizational subsystems as well as between the organizational performance as an entity and its environment as depicted in Figure 2-15.

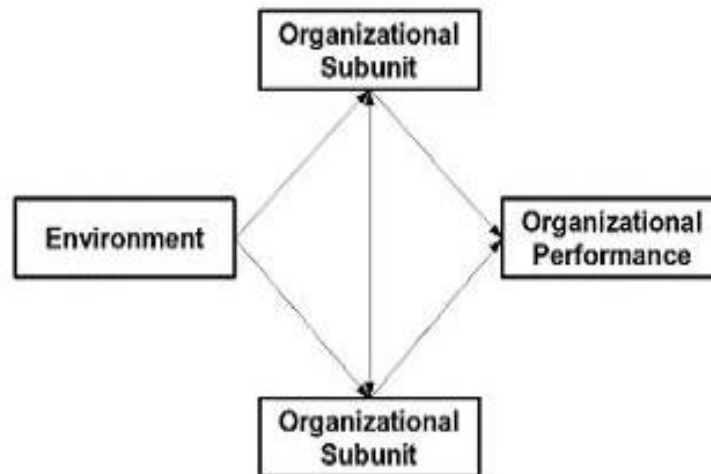


Figure 2-15: A Simplified Model of Contingency Theory in Organizational Research  
(Szilagyı & Wallace, 1980)

This model explicates the effect of environmental variables on subunit of organizational structure can effect to organizational performance. The main assumption of contingency theory assumes that “the better fit among variables can generate the better performance of organization” (Weill & Margrethe, 1989). This proposition was argued that only environment variable is inadequate to explain the fit and organizational performance there by this vital assumption was modified in many diversity forms, for instance, organization behavior, design performance, planning and management strategy scholar. Ayman et al. (1995) studied many different styles of leaders who worked in different context and proposed contingency theory of leadership to match leaders to appropriate organizational situation. Vroom and Jago (1988) investigated the effectiveness of decision procedure depended upon a number of aspects of the situation and proposed contingency theory of decision making. Donaldson (2001) suspected that most effective organizational structural design is where the structure fits the contingencies so he proposed contingency theory of organization structure (Donaldson, 2001). Whereas contingency theory dominated vary subjects, the main concept still focused on the mutually proposition that the concept



of fit between contingency variables in order to create an organization outcome. The important characteristics underlying contingency theory are fit, and performance, rationality, situation determinism and use of deterministic model (Korlaar, 2007).

The contingency theory assumes that the optimal structure of organization depends upon different internal and external constrain called contingency variables such as size, strategy, technology, and task uncertainly (Clegg, Hardy, & Nord, 1996). The development of contingency theory in organizational research is an interesting that it sheds light on the widely applied of contingency perspective in both organization and IS research (Thompson & King, 1997). The following section will briefly discuss on contingency in MIS field.

### 2.3.2 Contingency theory in MIS Research

In the field of management information system (MIS), Weill and Margrethe (1989) developed the contingency theory based on organizational research by underlying assumption of fit between MIS and organization performance. They identified a number of contingency variables that influence to the performance of MIS and organizational. MIS was defined as an integrated functions of the information systems in the organization such as support operation, management, analysis and decision making (Davis & Olson, 1985). As mentioned in the prior section, the main assumption of *“the better fit among contingency variables, the better organizational performance”* is rooted in contingency theory from organizational research as it assumes that the better fit among contingency variables, the higher firm performance.

According to Weill and Olson (1989) the contingency theory is applied to understand the interrelationship of fit between MIS characteristics and MIS performance as well as fit between and MIS performance and organization performance (Weill & Margrethe, 1989). They reviewed 177 articles and meta-analysis contingency research in MIS area then proposed the contingency theory of MIS as presented in Figure 2-16

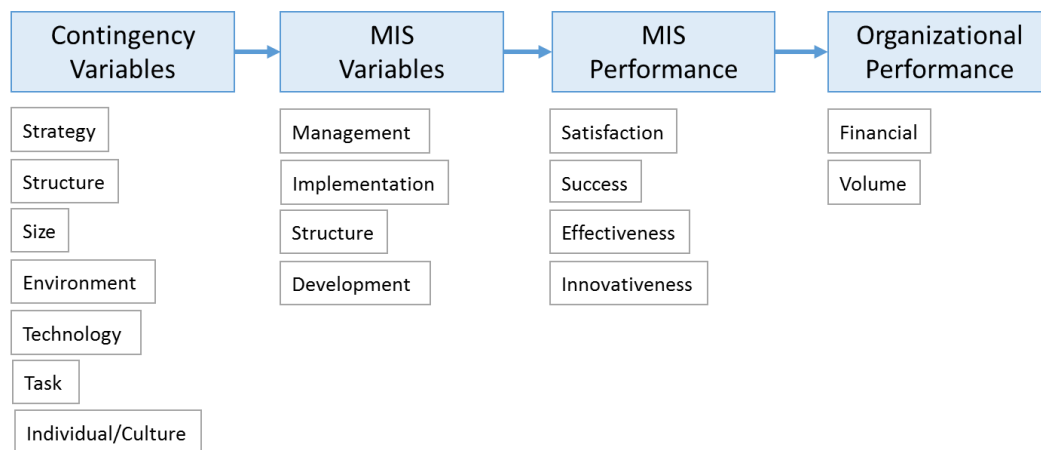


Figure 2-16: Representation of Contingency Theory in MIS Research  
(Weill & Margrethe, 1989)

This model shows the relationship between a set of contingency variables to MIS variables, MIS performance and organizational performance. Weill and Olson (1989) identified seven useful contingency variables in MIS research including strategy, structure, size, environment, technology, tasks, and individual/culture based on assumption that these variables influence on MIS variable (management, implement, structure and development) effect to MIS performance (satisfaction, success, effectiveness, innovativeness) and result to organizational performance (financial, volume). In the field of MIS, there are typical operationalized measurements for MIS performance such as user satisfaction, system success, system effectiveness, system quality or innovativeness. Organizational performance can be measured by financial measures, for instance, total general expense per total premium expense, return on net worth or measure of volume such as sale, sale growth. Table 2-4 illustrated the meaning of seven contingency variables in MIS area.

Table 2-4: Description of Contingency Variables in MIS (Weill & Margrethe, 1989)

| Contingency Variable | Description  |
|----------------------|--|
| Strategy             | Organizational strategy which defines a direction and strategic planning process for organization. |

| Contingency Variable | Description  |
|----------------------|--|
| Structure            | Organizational structure for example centralization, decentralization.   |
| Size                 | Firm size that measured by total number of employees.  |
| Environment          | External volatility of the business for example, regulation, industry sector of economy such as banking, technology. |
| Technology           | Type of MIS or its sophistication.   |
| Task                 | Organizational activities which is supported by information system.  |
| Culture              | Individual characteristics of organization.  |

This contingency theory model is broadly used in field of MIS, for example, determining the success factors of MIS (James D. McKeen, Guimaraes, & Wetherbe, 1994); examining the interrelationships between IT, organizational factors and organizational performance (Henderson & Venkatraman, 1993). Next section will discuss how to apply contingency theory with IT governance area.

### 2.3.3 Contingency Variables in IT governance

The concept of 'fit' refers to a situation where factors or variables are positioned in such a way that the ideal situation or outcome arises thereby the proposition of contingency theory in MIS assumed "fit" as "the best fit between contingency variables and the design and use of MIS, the better MIS performance and operational performance" (Weill & Margrethe, 1989). As a consequence, past literatures in IT and MIS fields were dominant with contingency theory in MIS in determining the MIS performance and organization performance.

From a literature review, contingency variables in MIS were also adopted in the IT governance research to identify the alignment of IT with the overall

organizational context. There were some studies that apply contingency variables in MIS to examine the connection with IT governance. For instance, Earl (1989) employed one contingency variable namely strategy and applied it which IT governance process implementation to suspect the influence with organizational performance and he found that the alignment with business needs and IT governance strategy can bring strategic benefits to organization (Earl, 1989). Besides, Tavakolian (1989) also investigated strategy variable and found that it had an influence on the technology deployment (Tavakolian, 1989). In addition, Weill (2004) examined structure of IT governance which was classified into six archetypes including business monarchy, IT monarchy, feudal, federal, IT duopoly, and anarchy and he found that each type has important impact on IT governance implementation (Peter Weill & Jean W Ross, 2004). Another contingency variable which is size of a corporation such as number of employees or revenue is also associated with the degree of IT governance structure (Ein-Dor & Segev, 1982; Sambamurthy & Zmud, 1999).

There are contingency variables that indicate the existence of a link with IT governance context. Sambamurthy and Zmud (1999) applied strategy variable such as centralized, decentralized, and the federal, and another variable which is environment such as corporate governance, economies of scope, and absorptive capacity, to explain and conceptual IT activities pattern and define it as structural arrangement of IT governance (Sambamurthy & Zmud, 1999). Apart from this, cultural or individual characteristic refers to individual differences and the fit with various IT activities that can reflect managing IT workers and workplaces and social support (Weill & Margrethe, 1989). This contingency variable was used to inspect a linkage with IT governance implementation and the result indicated that organizational culture related with business performance improvement and influenced to the success of IT governance implementation (Fink & Ploder, 2008). Moreover, some researchers investigated the relationship between organizations' IT governance design and contingency variables using contingency theory (A. E. Brown & Grant, 2005; Weber, Otto, & Sterle, 2009).

According to some examples above, it seems that some contingency variables have an impact to IT governance and organization performance. However,

prior researches approach accounted for only some contingency variables and only focused on the effect of contingency variables to IT governance structure, successful of IT governance implementation and organizational performance with no regard to IT governance process selection viewpoint. Contingency theory states that “there is no one best way for making a decision because it depends on a mixture of various factors/variable” (Fiedler, 1964). In applying contingency theory to MIS research there was a result showed that “the better fit between contingency variables and the design of MIS influence the better performance of MIS and organization” (Weill & Margrethe, 1989). It appears that determining a right combination of contingency variables could enhance an organizational outcome and improve better performance. Furthermore, there is still lack of research on applying contingency theory in selecting IT governance processes. For this reason, this study interested in find out what are importance of contingency variables in IT governance processes selection and business-IT alignment of an enterprise. Moreover, understating how each contingency variable influences to IT governance process selection could help to explain the selection of IT governance process.

#### **2.4 Perception Concept**

Oxford English Dictionary defines the term of perception is as the ability to understand the true nature of something. Likewise, in philosophy, psychology, and cognitive science, perception refers to the process of acquiring awareness or understanding of sensory information (Gibson, 1966). The meaning of sensory usually assigns to information resulting from stimulation of the eyes, ears, nose, mouth, or skin receptors (Shergill, 2012). Moreover, in organizational behavior research field, perception is described as the process by which people select, organize, interpret, retrieve, and respond to information (Uhl-Bien et al., 2013). Concept of perception is defined as a process that are divided into four main components including exposure, attention, interpretation, and response, as shown in Figure 2-17 (Solomon et al., 2012).

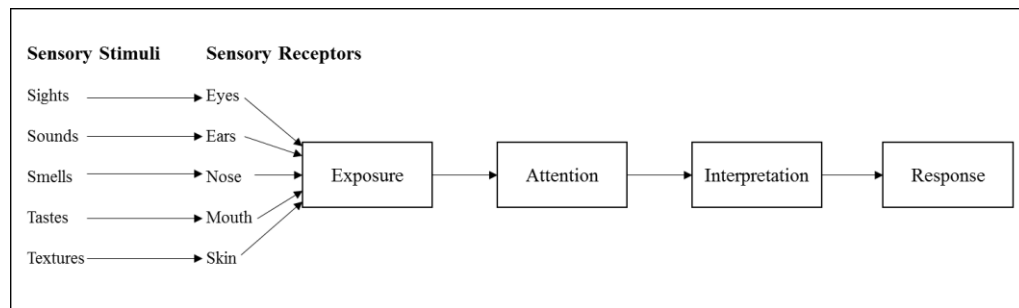


Figure 2-17: Components of Perceptual Process

The four components of the perceptual process are derived from the stimulation of sensory receptors or one's ultimate experience that happens when the series of events required for an organism (eyes, ears, nose, mouth, and skin) to receive a stimulus. The first component, exposure, occurs when stimuli act on sensory receptor nerves, for instance, seeing something, hearing some noise or some information. These sensory generate the experience involves both the recognition of environmental stimuli and actions in response to the stimuli. The second component, attention, occurs after a person has already experienced something and the brain considers and recognize it into the memory and leads to a person's understanding. The third component, interpretation, is a way of thinking and believing based on experience and understanding. The fourth component, response, occurs when the person has to make a decision to select something by considering the information that he or she has prior received.

In marketing research, perception concept has been widely applied to study about consumer behavior. The perceptual process refers to the influence of stimuli such as sights, sounds, smells, tastes, and textures, which produce sensations in the consumer. Once the consumer's attention has been caught in this way, he or she starts interpreting these stimuli and generating responses (Hawkins & Mothersbaugh, 2009). As a result, marketers apply the perceptual process to appeal to consumers' senses, prompt them to interpret the stimuli, and encourage them to respond by making a decision to buy a product or service. Academic literature indicates that people will select or make a decision to adopt something, depending on their perception (Uhl-Bien et al., 2013).

This study aims to understand the factors that related to IT governance process selection by solicit the opinion and attitude from IT governance expert, it would be better to draw their perceptions about importance and business-IT alignment of IT governance process. In addition, perception concept is widely adopted for decision and selection stage in marketing area but have not applied selection stage in IT governance area. For this reason, this study realized to apply perceptual process as a supplementary concept to develop an interview question guide in order to enhance a viewpoint on how IT governance experts in Thailand would perceive the adoption and selection of IT governance processes.

## **2.5 Conceptual Model**

This section presents a conceptual model for selecting IT governance processes by providing a visual representation of theoretical constructs and variables of interest. Referring to this study's objectives which are to identify the contingency factors influencing the selection of IT governance processes and to determine the effect of contingency factors on the IT governance processes selection. Based on these objectives, designing this research conceptual model begins with conducting a thorough review of the literature in IT governance and contingency factors. Contingency theory is used as the theoretical base for this research. In addition, the ultimate goal of this research is to provide a guideline for selecting IT governance processes which is driven by contingency theory and focuses on business-IT strategy alignment outcome. Literature about business-IT alignment and IT governance processes adoption were reviewed. The conceptual model includes the factors recommended by contingency theory that affect the selection of IT governance processes and the alignment between business and IT as shown in Figure 2-18.

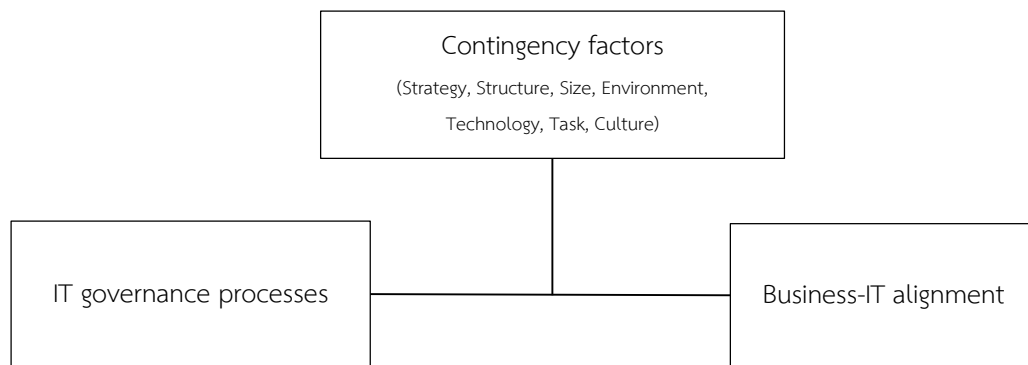


Figure 2-18: Conceptual Model of IT Governance Processes Selection

This research related with three main areas which are IT governance processes, Contingency factors, and Business-IT alignment. IT governance processes considered in this research are eighteen processes from two domains of COBIT5 that focus and cover on the strategic level of IT governance (ISACA, 2012). Business-IT alignment is an ultimate outcome that can be achieved by the best fitted IT governance processes implementation (De Hases & Grembergen, 2009). Contingency factors are a set of seven variables including strategy, structure, size, environment, technology, task, and culture that use to explain the fit between MIS and organization performance (Peter Weill and Marcrethe H. Olson,1998). The assumption of this study is that these potential variables could influence to the fitness of IT governance processes selection that could help organizations to accomplish the ultimate goal which is the alignment between business and IT. This research investigates what contingency variables or contingency factors could explain this phenomenal.

## 2.6 Summary

This chapter provides the review of theoretical and empirical literature related to this research topic which are IT governance, business-IT alignment and contingency theory. Firstly, various definitions of IT governance were discussed and the definition adopted in this research was addressed. Concept of IT governance was provided with explanation of the different between IT governance and corporate governance. The IT governance and IT management terms were defined. Moreover, to deeply understand IT governance, the structure of IT governance was expressed which can be viewed from various aspects such as principle, decision-making domain,



mechanism, and process. IT governance processes and IT governance best frameworks were explained. Secondly, business-IT alignment, which is a key benefit from IT governance adoption was reviewed. Thirdly, contingency theory which is the focal theoretical of this research was explained. It was originally introduced in behavior theory. Then it was developed into organizational theory in many different domains. The contingency theory has been applied in MIS research and also in IT governance context. Moreover, this research recognizes the important concept that related with how to make a decision to select a thing. Therefore, perception concept, which is developed from psychology to explain the process of decision-making, was reviewed as a supplementary concept for design interview questions. Finally, research conceptual model was developed. The following chapter will elaborate the methodology of this research.



## Chapter 3 Methodology

This chapter describes the methodology used in this research. In order to achieve the research objectives, this study adopts an inductive approach as the main method for managing the delivered contributions. This chapter begins with research method with general discussion of Delphi technique. It then follows by an explanation of the research design and data collection procedures.

### 3.1 Research Method

As presented in chapter one, the ultimate aim of this research is to provide a guideline for selecting IT governance processes which is driven by contingency theory and focuses on business-IT strategy alignment. This research was designed to employ qualitative method using Delphi technique for data collection. The utilization of this technique can help to solicit advices from a group of experts and facilitate the accommodation of unanimity opinions.

#### 3.1.1 Qualitative Method

The qualitative method represents a form of data collection and analysis with a focus on understanding or interpreting phenomena and an emphasis on meaning that people express without attempting to infer any type of causation (Edmonds & Kennedy, 2012). The qualitative process is generally inductive and considered as emerging and non-experimental approach that focuses on multipoint of people and tries to understand and research the conscious mind, thinking, and behavior of human being (Neuman, 2002). Research under the qualitative method is often considered to explore the “how” and “why” of systems and human behaviors and what governs these behaviors (Benbasat, Goldstein, & Mead, 1987). The purpose of qualitative research is to explore in-depth details or particular cases and mostly used to find a substantial information, characteristics, feeling, or processes. Qualitative research usually studies things in their natural settings without trying to manipulate or control anything (Denzin & Lincoln, 2011).

The dissimilar between quantitative and qualitative approaches is that quantitative research is more concerned about issue of design, measurement, and sampling because of its deductive approach, whereas qualitative research is more concerned about issue of the richness, texture, and feeling of raw data because of its inductive approach (Neuman, 2002). The strength of qualitative research is its ability to provide complex textual descriptions of how people experience a given research issue and also its effectiveness in identifying intangible factors, such as social norms, socioeconomic status, gender roles, ethnicity, and religion, etc. (Mack, Woodsong, MacQueen, Guest, & Namey, 2005).

In qualitative research, there are various approaches for researchers to collect data such as action research, case study and ethnography (Charmaz & McMullen, 2011). Different approaches have different styles of data collection and data analysis. For example, action research aims to contribute or improve something from the intervention of researcher during the collection of data by giving their idea or suggestion to the respondents (Rapoport, 1970). In turn, case study points to uncover the manifest interaction of significant factors or characteristics of phenomenon, individual, community, or institution (Yin, 1994). The design of case study is aimed to provide the opportunity to ask in-depth questions to gather the rich source of data and also to examine an individual or phenomenon within a specific context (Edmonds & Kennedy, 2012). Case study research may feature single-case or multiple-case studies (Yin, 2009). Single-case study is used to identify the specific “case” to study that aims to better in-depth understanding of the phenomenon, whereas multiple-case study is used to explore differences within and between cases that aims to replicate findings across cases (Yin, 2009). There is another approach namely Delphi technique that particularly appropriate for forecasting or attempting to predict the future which is deemed suitable for developing a guideline.

### 3.1.2 Delphi Technique

Delphi technique is defined as a qualitative method that draws the opinions from respondents within a domain of their expertise to develop theories and projections for the future (Linstone & Turoff, 1975). The uniqueness of this method is

that it is useful to aggregate opinions from a diverse set of experts when it is not possible to convene experts in one meeting (Bourgeois, Pugmire, Stevenson, Swanson, & Swanson, 2006). The Delphi is labeled in the literature variously as a “technique” (Broomfield & Humphris, 2001), a “procedure” (Rogers & Lopez, 2002), a “method” (CRISP, Pelletier, Duffield, Adams, & Nagy, 1997; Linstone & Turoff, 1975), and a “survey” (Wang et al., 2003). In this study, Delphi will be referred as a ‘technique’ because this appears to be the most commonly used terminology in the research literature.

Delphi technique was originally developed by RAND (Research and Development) Corporation, Santa Monica, California, in 1950s to explore new methods of forecasting the impact of technology on warfare for a U.S. military project (Dalkey & Helmer, 1963). The aim of this project was to develop a technique to achieve a convergence of specific opinion and to obtain the most reliable consensus of a group of experts (Helmer, 1966). Since the objective of Delphi technique is to collective opinions from experts, it has been extensively modified and become a useful technique for forecasting and decision making (Gupta & Clarke, 1996).

Delphi technique has been widely adopted in many fields especially in health research (Murphy et al., 1998). In addition, this technique also has been applied to a wide variety of situations as a tool for expert problem solving, forecasting, and making appropriate plans for the future (Al Omari, Barnes, & Pitman, 2013). In information systems (IS) research, Delphi technique has been proven as a popular tool for identifying and prioritizing issues for managerial decision-making, forecasting, and issue identification (Okoli & Pawlowski, 2004). In the context of IT governance, this technique also has been employed to study effectiveness and ease of IT governance implementation (De Haes & Van Grembergen, 2008a).

Van de Ven and Delbecq (1974) initially developed the guideline for conducting Delphi technique comprises of identifying the problem, selecting a panel of experts, conducting various iterations of the questionnaire and evaluation process, and drawing conclusions based on the experts’ consensus. This technique consists of repetitive rounds and procedures until the general agreement reaches a consensus.

The three major phases of the Delphi technique were provided by Schmidt as shown in Table 3-1 (Schmidt, 1997).

Table 3-1: Major Phases of Conducting Delphi Technique

| Phase                                    | Procedure  |
|--|--|
| 1. Discovery of issues                   | <ul style="list-style-type: none"> <li>– Identify problem of research topic and specification of research question(s).</li> <li>– Select panel by determine the number and qualifications of expert panels.</li> </ul>   |
| 2. Determining the most important issues | <ul style="list-style-type: none"> <li>– Administer questionnaire: Researcher develops and distributes a questionnaire to each panel member and encourage them to draw upon their experiences to complete answer.</li> <li>– Evaluate responses: The experts give their opinion and return the questionnaire to researcher. Then researcher reviews the responses and uses this information to develop more specific questions to be used in the next subsequent questionnaire.</li> </ul>                             |
| 3. Ranking the issues                    | <ul style="list-style-type: none"> <li>– Redistribute questionnaire: The subsequent questionnaire consists of the results from the previous questionnaire and the new questions formulated by the researcher. The experts rank the result items to establish priorities, review and revise any of their previous answers, and fill out the questionnaire and return it to researcher.</li> <li>– Interpret results: Researcher continues this process until a consensus is reached by the group of experts.</li> </ul> |

This technique is recommended in evaluation study as it requires a group of experts to response a survey and subsequently receive feedback in the form of a

statistical representation of the group response. (Linstone & Turoff, 1975). It allows respondents to alter the original assessments if they want to change their previous opinion after which the process repeats itself.

A key advantage of this technique is anonymity in responding to individual question by anonymous to each other which is especially useful for avoiding direct confrontation of the participants (Goodman, 1987). Moreover, the value of this technique is to identify the most important issues of interest by soliciting qualified experts (Okoli & Pawlowski, 2004). Delphi technique is a flexible research technique that has been successfully used to explore new concepts within and outside of the information systems body of knowledge and works especially well when the goal is to improve understanding of problems, opportunities, solutions, or to develop forecasts (Skulmoski, Hartman, & Krahn, 2007).

However, the consideration of using Delphi technique is that this technique is time consuming to coordinate and manage this iterative approach that involves many steps such as sample selection, data collection, analysis and interpretation. In addition, this technique requires more time consuming for the respondents than traditional survey as it is a repetitive process that the participant have to be consulted at least twice on the same question and the estimated average time under this techniques could take at least 45 days to five months (Delbecq, Van de Ven, & Gustafson, 1975).

Delphi technique is subjective and qualitative in nature that relies on the judgment of individuals who are presumed to be knowledgeable and have experience in specific area. It also aims for obtaining consensus among a group of experts. Next section will explain how to consider Delphi technique for research design.

### **3.2 Research Design**

In order to design procedure and activities to fulfill this research objectives, concerning and planning action to link research methods to answer research questions is a key. The main objective of this study is to contribute to the growing body of work

on the contingency factors that affect IT governance processes selection. Specifically, this research study investigates to answer these two questions as follows:

*Q1: What contingency factors influence the selection of IT governance processes?*

*Q2: How can contingency factors be adopted to derive an IT governance processes selection guideline that concerns business-IT strategy alignment?*

In order to find the answers to the above research questions, the researcher also needs to understand the perceptions that underlie and influence the behaviors of someone who has special experience and knowledge in the context of this research. To achieve the last research question, it requires to generate ideas from the experts to develop a guideline. Qualitative method is primarily exploratory research that used to gain an understanding of underlying reasons and opinions. According to this method characteristic, it is suitable to apply qualitative method to fulfil this study's objectives. However, there are many research approaches in qualitative method. In order to answer all above research questions, it requires an approach that provides an opportunity to solicit expert opinions and identify priority of variables about selection criteria.

Since Delphi technique is conceived as a way to obtain the opinion of experts to exploratory theory building on complex and interdisciplinary issues (Akkermans, Bogerd, Yücesan, & Van Wassenhove, 2003), this technique provides three main phases that can help to explore and prioritize of contingency factors that influence the IT governance processes selection. Furthermore, Delphi technique is a systematic approach to solicit the opinion from experts that can help to generate ideas to formulate a guideline in IT governance processes selection practices. The outcome from this technique appears to answer all above research questions. Therefore, the Delphi technique is considered appropriate as the main research methodology for this research.

This research followed the Delphi technique guideline as proposed by Schmidt (1997) which classifies into three phases. Since the result of Delphi technique

depends on the knowledge and cooperation of the participants, it is important to get the recognition and acceptance of other experts as being valid. Therefore, this research adds one more phase to formulate and validate the findings from the Delphi study. The design of this research is illustrated in Figure 3-1.

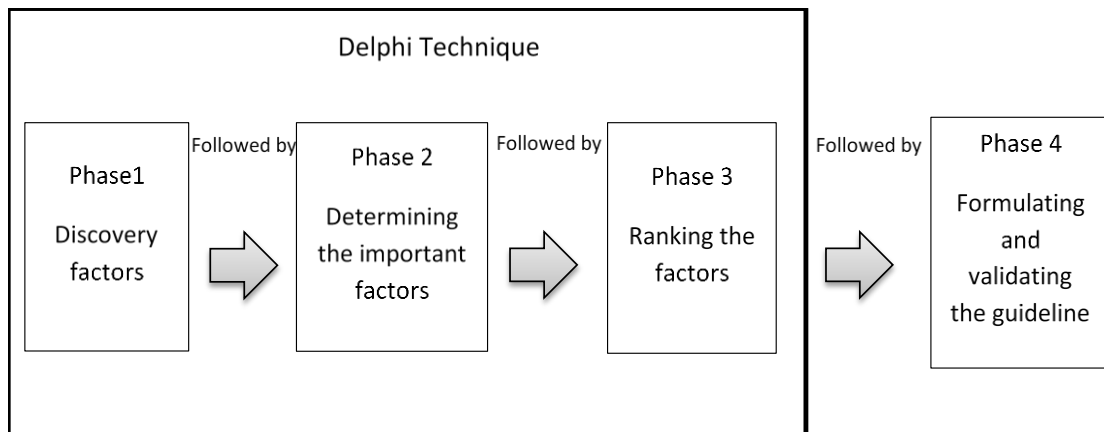


Figure 3-1: Research Design

In the first phase, discovery factors, qualitative inductive with Delphi technique was used to discover the factors associated to IT governance processes selection. In this phase, this research used the semi-structured interview method because it can provide the structure as well as the opportunity to ask participants in-depth questions about their selection criteria and perception in IT governance practices. These findings would emerge variables driven from contingency theory, such as strategy, structure, size, environment, technology, tasks, and culture. The semi-structured interview conducted with all participants. The expected result from this exploration phase was a list of factors and a list of IT governance processes that could lead to the formulation of a questionnaire for the second phase.

The second phase, determining the important factors, aims to determine opinions and factors from the previous phase's findings to develop the first questionnaire. The first questionnaire will provide pre-existing information to all participants. Then, the participants will be asked to select the most important factors which influence IT governance processes selection for enhancing business-IT



alignment. The response from this phase were used to guide the development of the second and third questionnaires in the next phases.

The objective of the third phase, ranking the factors, is to rank or rate the consolidated list of factors based on the findings from the second phase. The second questionnaire are divided into two parts. The first part offers the first-round questionnaire outcomes. The respondents will be asked to review and refine their previous responses. The second part asks the respondents to rank the list of factors. As Delphi technique is a repetitive process through a series of rounds of questionnaire surveys, usually two or three rounds are conducted until it achieves a consensus from a group of participants (Hanafin, 2004). When the consensus was achieved, the list of IT governance processes and the list of variables which affect IT governance processes selection expressed as an outcome from this procedure.

The final phase, formulating and validating the guideline, aims to formulating the findings into a guideline and to determine whether the proposed guideline is appropriated in the real world from the perspective of other group of experts. This phase will be conducted after main three phases of Delphi technique. It is a supplement phase to increase the creditability of the research result by asking the experts to validate the proposed guideline.

### **3.3 Research Procedure**

This section sets out key steps relating to Delphi research method and briefs the main activities in each phase of the research. Figure 3-2 presents procedures of all phases in this study.

#### **3.3.1 Phase 1: Discovery Factors**

Starting with the first phase, discovery factors, there are four steps in this phase including select participants, prepare open-ended questions, conduct a semi-structured interview, and analyze responses. The criteria for selecting a group of participants is explained in Section 3.4.1. The open-ended questions will be prepared as interviewing guide for conducting a semi-structured interview with all participants.

### 3.3.2 Phase 2: Determining the Important Factors

In the second phase, determining the important factors, there are three steps including prepare questionnaire, conduct the first round survey, and analyze responses from questionnaire. This phase requires participants to verify the relevant lists of factors that are correlated with IT governance processes selection. The results from the first phase, the list of IT governance processes and factors, will be used to develop the first questionnaire. Then the first questionnaire will be distributed to all participants to answer the questionnaire. After all participants returned their responses, data will be analyzed by using descriptive and inferential statistic to significantly reconcile different perspectives and group them into categories.

### 3.3.3 Phase 3: Ranking the Factors

In the third phase, ranking the factors, there are five steps including revise questionnaire, conduct subsequent survey, analyze responses, assess consensus, and summarize conclusion. The second phase's results will be used to create the second questionnaire by listing all consolidated factors and categories obtained from the first questionnaire. The second questionnaire requires participants to rank the given list of factors and IT governance processes. Based on their responses, the data will be analyzed by calculating a mean rank for each item to identify the convergence from all responses. The data will be assessed to find a consensus for each item by using measurement as explained in more details in section 3.6.

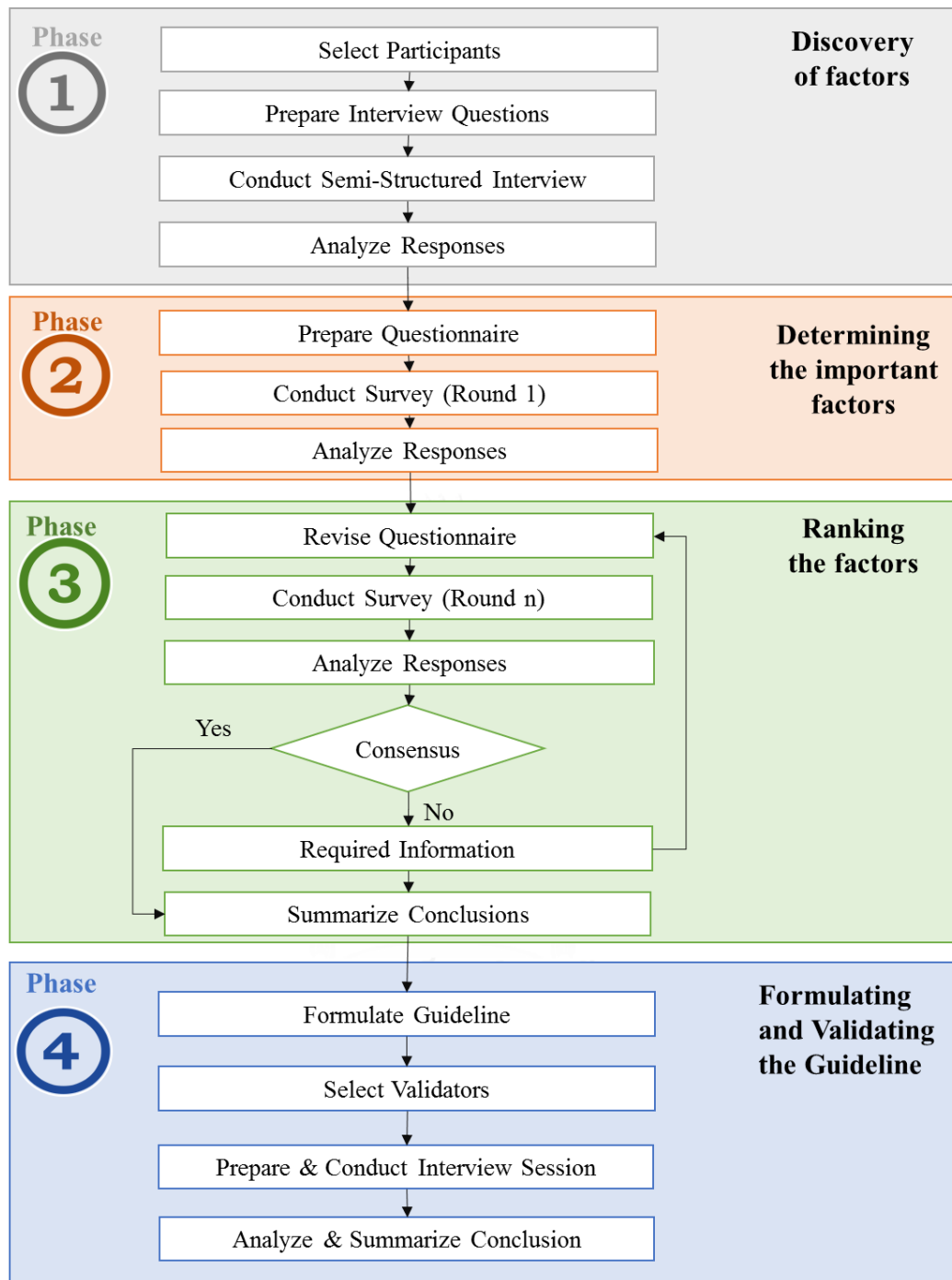


Figure 3-2: Research Procedures

### 3.3.4 Phase 4: Formulating and Validating the Guideline

In the last phase, formulating and validating the guideline, there are four steps including formulate guideline, select validators, conduct interview session and summarize conclusion. The guideline will be formulated based on all results from the

previous phases by using statistical technique. In order to increase validity of this research outcome, the guideline should be validated by another group of experts which called as validators. Selecting the validators is an important step and the criteria to select validators is by considering persons who have qualified knowledge, skill, and experience in IT governance domain. After getting acceptance from validators, interview session will be prepared and conducted to inquire perspective and suggestion whether the proposed guideline can contribute in practice. Conclusion of opinions from the validators will be summarized.

### **3.4 Research Context**

#### **3.4.1 The Experts**

The key to apply a successful Delphi technique lies in the selection of experts. Choosing qualified and appropriate experts is the most concern for this technique because it is directly related to the quality of the results (Gordon, 1994). Selection of experts has to be considered carefully. In order to obtain sufficient and worthwhile data for this research, this study followed the five steps to solicit qualified experts as suggested by Delbecq et al. (1975) including determine criteria, identify expert, nominate additional expert, rank expert and invite expert.

As this research focuses on IT governance processes selection, a qualified expert should be a person who has respectable amount of experiences in IT governance. There are some relevant articles in the IT governance area which define the roles and responsibilities of a person who has authority and makes a decision in IT governance process. For example, Wim Van Grembergen (2004) noted that IT executives and/or IT steering committees in managing IT within the organization are persons who make decisions on IT governance adoption. Moreover, IT governance committees should be a mixed of business unit membership, corporate membership, and IT membership (Symons, 2005). De Haes and Van Grembergen (2009) did an empirical research by using Delphi technique to further complete the initial list of IT governance practices, they defined senior consultants from IT and business area who were knowledgeable in their context as the experts. Delbecq et al. (1975) suggested that qualified experts should have relevant disciplines, knowledge, skills, experiences

and willing to be involved over a substantial period of time. Cuhls (2003) recommended that group of expert should be a mixture of persons from industry/business, academia, research institutions, and others.

Based on these considerations, this study identified the expert as a person who has relevant disciplines, knowledge, skills, experiences, and occupational positions related to IT governance.

It is necessary to identify prospective participants to qualify as the experts. As suggested from literature that a group of experts should be a mixture from various background or position in order to represent a wide range of opinions. The prospective participants for this study will be selected according to the expert criteria from various industries.

According to role and responsible in IT governance, the qualified participants might include IT executive, IT steering committee, IT manager or IT consultant which every one of them is acting as a key decision maker in IT for their organization. To get extensive variety of opinions, prospective participants should include some experts from academic, for example professor, lecture or researcher, who have a good knowledge in IT governance. Moreover, selecting participants from different industries is considered to provide different perspectives in IT governance and business-IT alignment that in turn can give multi aspects to construct relevant data that suits for this research.

In a statistical study, participants are assumed to be representatives of any population. As explained earlier, Delphi technique is a group decision mechanism requiring qualified experts who have deep understanding of the issues. Therefore, this technique does not depend on a statistical sample (Goodman, 1987). Following the characteristic of Delphi technique, non-probabilistic and purposeful sampling method is used to choose the target participants. In addition, there are many recommendations to define size of participants in Delphi technique. For example, number of participants should be 10 to 18 people and classified up to four panels (Paliwoda, 1983). The other study suggested that the number of participants should

be 10 to 15 people as it depends upon the diversity of targeted population (Taylor-Powell, 2002). However, Williams and Webb (1994) argued that there was no precise mechanism for identifying the number of participants or the number of panels (Williams & Webb, 1994). Moreover, size of the panel may vary; it can be one or more panels according to the nature of different viewpoints and topics covered as well as time and budget available (Van Zolingen & Klaassen, 2003).

Selecting participants in Delphi technique does not depend on the size of participants and number of panels or number of rounds it takes to reach a consensus. However, the most critical requirement is experienced and knowledgeable persons who will be the participants in that research. This study needs multi-lens perspective from qualified participants so it is necessary to identify as many experts as possible. Therefore, this study applied snowball technique to nominate an additional expert. Snowball technique is defined as a non-probability sampling technique that asks one subject to nominate another person with the same trait to be a next research subject (Vogt & Johnson, 2011). This technique is used to recruit potential subjects in studies where subjects are difficult to access.

After identify individuals in relevant disciplines and experience who are quailed as the experts in this study, ranking and comparing the qualifications of possible participants had been processed to prioritize who are the candidates to be invited in this study. Since the result quality of Delphi technique depends on expert opinion, it is necessary to ensure that identification and invitation of the most qualified participants has been verified. Section 3.5.1 explains the invitation activity and the profile of each participant.

#### 3.4.2 Interview Guide and Questionnaire

This research will classify the research procedure into four phases. The purpose of the first phase is to discover contingency factors related to IT governance processes selection by using a semi-structure interview with individual participant. The interview guide will be designed based on seven contingency factors driven by contingency theory and IT governance processes from COBIT5 framework. As this

research aims to explore IT governance processes perception with focus on business-IT alignment, key domains in COBIT5 was reviewed to define the appropriate IT governance process with this research context.

COBIT5 divides the IT processes into five domains (ISACA, 2012a). The first two domains, which are Evaluate, Direct and Monitor (EDM) and Align, Planning and Organize (APO), focus and cover on the strategic level of IT governance. The rest three domains emphasize on operation level and most of the processes centers to implement, execution and monitoring activities. Regarding to this research context, the first two domains, EDM and APO, are in line and contain most relevant processes of IT governance. Therefore, they will be selected as the study context in this research.

In COBIT5, the first domain, EDM, contains five governance processes which are EDM01 to EDM05. The second domain, APO, contains thirteen governance processes which are APO01 to APO13. In total, these two key domains have eighteen IT governance processes. For consistency and clarity of the interview guide and questions throughout the four phases of this research, IT governance processes will be assigned the IT governance process no. as No.1 to No.18 as shown in Table3-2.

Table 3-2: IT Governance Processes

| No. | COBIT Code. | Domain in COBIT                    | Process Name  | Process Description  |
|-----|-------------|------------------------------------|---|--|
| 1   | EDM01       | Evaluate, Direct and Monitor (EDM) | Ensure Governance Framework Setting and Maintenance | Analyze and articulate the requirements for the governance of enterprise IT, and put in place and maintain effective enabling structures, principles, processes and practices, with clarity of responsibilities and authority to achieve the enterprise's mission, goals and objectives. |

| No. | COBIT Code. | Domain in COBIT                    | Process Name                        | Process Description  |
|-----|-------------|------------------------------------|-------------------------------------|--|
| 2   | EDM02       | Evaluate, Direct and Monitor (EDM) | Ensure benefits delivery            | Optimize the value contribution to the business from the business processes, IT services and IT assets resulting from investments made by IT at acceptable costs.                            |
| 3   | EDM03       | Evaluate, Direct and Monitor (EDM) | Ensure risk optimization.           | Ensure that the enterprise's risk appetite and tolerance are understood, articulated and communicated, and that risk to enterprise value related to the use of IT is identified and managed. |
| 4   | EDM04       | Evaluate, Direct and Monitor (EDM) | Ensure resource optimization.       | Ensure that adequate and sufficient IT-related capabilities (people, process and technology) are available to support enterprise objectives effectively at optimal cost.                     |
| 5   | EDM05       | Evaluate, Direct and Monitor (EDM) | Ensure stakeholder transparency.    | Ensure that enterprise IT performance and conformance measurement and reporting are transparent, with stakeholders approving the goals and metrics and the necessary remedial actions.       |
| 6   | APO01       | Align, Plan and Organize (APO)     | Manage the IT management framework. | Clarify and maintain the governance of enterprise IT mission and vision. Implement and maintain mechanisms and authorities to manage information and the use of IT in the enterprise in      |



| No. | COBIT Code. | Domain in COBIT                | Process Name                    | Process Description  |
|-----|-------------|--------------------------------|---------------------------------|--|
|     |             |                                |                                 | support of governance objectives in line with guiding principles and policies.   |
| 7   | APO02       | Align, Plan and Organize (APO) | Manage strategy.                | Provide a holistic view of the current business and IT environment, the future direction, and the initiatives required to migrate to the desired future environment. Leverage enterprise architecture building blocks and components, including externally provided services and related capabilities to enable nimble, reliable and efficient response to strategic objectives.   |
| 8   | APO03       | Align, Plan and Organize (APO) | Manage enterprise architecture. | Establish a common architecture consisting of business process, information, data, application and technology architecture layers for effectively and efficiently realizing enterprise and IT strategies by creating key models and practices that describe the baseline and target architectures. Define requirements for taxonomy, standards, guidelines, procedures, templates and tools, and provide a linkage for these components. Improve alignment, increase agility, improve quality of |

| No. | COBIT Code. | Domain in COBIT                | Process Name      | Process Description  |
|-----|-------------|--------------------------------|-------------------|--|
|     |             |                                |                   | information and generate potential cost savings through initiatives such as re-use of building block components.   |
| 9   | APO04       | Align, Plan and Organize (APO) | Manage innovation | Maintain an awareness of information technology and related service trends, identify innovation opportunities, and plan how to benefit from innovation in relation to business needs. Analyze what opportunities for business innovation or improvement can be created by emerging technologies, services or IT-enabled business innovation, as well as through existing established technologies and by business and IT process innovation. Influence strategic planning and enterprise architecture decisions. |
| 10  | APO05       | Align, Plan and Organize (APO) | Manage portfolio  | Execute the strategic direction set for investments in line with the enterprise architecture vision and the desired characteristics of the investment and related services portfolios, and consider the different categories of investments and the resources and funding constraints. Evaluate, prioritize and balance programmes and services, managing demand within resource and funding   |

| No. | COBIT Code. | Domain in COBIT                | Process Name             | Process Description   |
|-----|-------------|--------------------------------|--------------------------|---|
|     |             |                                |                          | constraints, based on their alignment with strategic objectives, enterprise worth and risk. Move selected programmes into the active services portfolio for execution. Monitor the performance of the overall portfolio of services and programmes, proposing adjustments as necessary in response to programme and service performance or changing enterprise priorities.  |
| 11  | APO06       | Align, Plan and Organize (APO) | Manage budget and costs. | Manage the IT-related financial activities in both the business and IT functions, covering budget, cost and benefit management, and prioritization of spending through the use of formal budgeting practices and a fair and equitable system of allocating costs to the enterprise. Consult stakeholders to identify and control the total costs and benefits within the context of the IT strategic and tactical plans, and initiate corrective action where needed. |
| 12  | APO07       | Align, Plan and Organize (APO) | Manage human resources.  | Provide a structured approach to ensure optimal structuring, placement, decision rights and skills of human resources. This includes  |

| No. | COBIT Code. | Domain in COBIT                | Process Name               | Process Description  |
|-----|-------------|--------------------------------|----------------------------|--|
|     |             |                                |                            | communicating the defined roles and responsibilities, learning and growth plans, and performance expectations, supported with competent and motivated people.  |
| 13  | APO08       | Align, Plan and Organize (APO) | Manage relationships.      | Manage the relationship between the business and IT in a formalized and transparent way that ensures a focus on achieving a common and shared goal of successful enterprise outcomes in support of strategic goals and within the constraint of budgets and risk tolerance. Base the relationship on mutual trust, using open and understandable terms and common language and a willingness to take ownership and accountability for key decisions. |
| 14  | APO09       | Align, Plan and Organize (APO) | Manage service agreements. | Align IT-enabled services and service levels with enterprise needs and expectations, including identification, specification, design, publishing, agreement, and monitoring of IT services, service levels and performance indicators.   |
| 15  | APO10       | Align, Plan and                | Manage suppliers.          | Manage IT-related services provided by all types of suppliers to meet  |

| No. | COBIT Code. | Domain in COBIT                | Process Name     | Process Description   |
|-----|-------------|--------------------------------|------------------|---|
|     |             | Organize (APO)                 |                  | enterprise requirements, including the selection of suppliers, management of relationships, management of contracts, and reviewing and monitoring of supplier performance for effectiveness and compliance.   |
| 16  | APO11       | Align, Plan and Organize (APO) | Manage quality.  | Define and communicate quality requirements in all processes, procedures and the related enterprise outcomes, including controls, ongoing monitoring, and the use of proven practices and standards in continuous improvement and efficiency efforts. |
| 17  | APO12       | Align, Plan and Organize (APO) | Manage risk.     | Continually identify, assess and reduce IT-related risk within levels of tolerance set by enterprise executive management.  |
| 18  | APO13       | Align, Plan and Organize (APO) | Manage security. | Define, operate and monitor a system for information security management.   |

In addition, the ultimate goal of this study is to provide a guideline for selecting IT governance processes to be implemented. In organizational behavior research, making a decision to select something is regarded as the perception step resulting in the Exposure, Attention and Interpretation of information among several alternative possibilities (Uhl-Bien et al., 2013). Exposure refers to a personal experience. Attention occurs when a person gathers information and analyzes it thoroughly until it

becomes his own understanding. Interpretation is a way of thinking and believing based on experience and understanding.

To make this research more logical in selection context, perception concept will be considered to extend the insight of selection in IT governance aspect. Three components from perception concept, which are Exposure, Attention and Interpretation, will be applied within this research context. Exposure is defined as experience in adopting IT governance processes. Attention is considered as the importance of IT governance processes. Interpretation is regarded as business-IT alignment supporting. The interview guide will be developed by combining IT governance processes with three perceptual components. The response choice of levels ranged from low, medium, and high. The categories items choices are defined as yes and no. The interview guide is categorized into three parts including 1) general information of respondent, 2) IT governance perception, and 3) related variable of IT governance process selection. The final interview guide (as in Appendix A) will be delivered to all participants before the interview session. The main result from this phase, which was the list of factors related to IT governance process selection, will be used to design questionnaire for the following phase.

The second phase covers the first round of survey by using questionnaire. The target of this phase is to determine what are the most important factors to select each IT governance process. The questionnaire (as in Appendix B) will be developed by linking eighteen IT governance processes with variables based on the findings from the first phase. Additionally, the results from previous interview phase will be included in this questionnaire in order to ask participants to review and reconsider their judgments.

The third phase is the beginning of initial iteration round of the survey. According to Delphi technique iterative surveys will be carried on. The classic Delphi indicates that it needs at least four rounds to reach a consensus (Dalkey & Helmer, 1963). However, some evidences demonstrated that either two or three rounds are preferred (Beech, 2001). The questionnaire in this phase will be generated in the same context. It has seven factors and eighteen IT governance processes. The survey may

be carried on many rounds until a consensus is reached. The results from the first round survey in this phase will be used to define the ranking of related factors for IT governance processes selection. The first questionnaire (as in Appendix C) provides a list of factors that influence IT governance processes selection and ranking order choices ranged from very influence to less influence. The second round in this phase aims to explore deeper on how to define level of each related factor with each IT governance process. The second questionnaire (as in Appendix D) will be created by using 4-point Likert scale. The choices range from no influence, low influence level, medium influence level, and high influence level.

It is important to consider how to design questionnaire that is convenience and easy for respondent. The questionnaire should not only easy to response but also should have a clear explanation and direction to avoid misunderstanding that may occur in data collection. Delphi techniques is time consuming as it has many stages and procedures. This research decided to use electronic questionnaire in PDF form and online questionnaire because it is appropriate and convenient to deliver and return feedback.

### 3.5 Data Collection

As mentioned earlier that this research divided into four main phases, these four phases have different procedures and require unequal period of time. The whole process of data collection and data analysis in all four phases spans one year and nine months. The timeline of this research is presented in Figure 3-3.

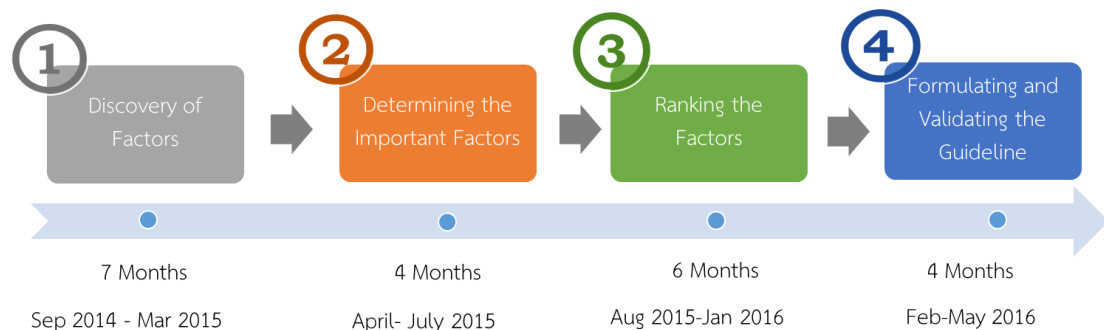


Figure 3-3: Research Timeline

First phase, discovery factors, used four months (September - December 2014) to select and invite the experts and another three months (January-March 2015) to conduct an interview with an individual expert. In the second phase, determining the important factors, the author spent one month (April 2015) to analyze the interview result and to develop a questionnaire then used another two months (May-June 2015) for conduct a survey. After received all feedbacks, it took one month (July 2015) to analyze the results and developed the second questionnaire. Third phase, ranking the factors, it took 6 months (August 2015-January 2016) to conduct two rounds of survey until gaining the consensus among the experts. The last phase, formulating and validating the guideline, it used four months (February-May 2016) to formulate the clustering guideline and to conduct interviews with another set of experts in order to validate the finding.

#### 3.5.1 Phase 1: Discovery Factors

In September 2014, the first phase was started by searching someone who met the criteria to be the experts in this research context. The prospect experts were selected base on the criteria the following criteria: having much experience in IT governance and management, having a good knowledge in IT governance process, having an experience in IT governance project, were in management level position which have authorize to make a decision in IT and willing to contribute with this reiterate survey process. The researcher first sought from the alumni of MSc in IT in Business Program, Faculty of Commerce and Accountancy, Chulalongkorn University, who were considered to have a significant knowledge, good skills, much experiences and obtain training or education in IT governance field. Twenty persons were selected based on those criteria. They were invited via email and phone call. The detail of research objectives and expert criteria was explained to all possible participants. It is likely that they might know someone who are more likely to be candidate in this specific field. Thus, they were asked to recommend someone to be a research subject. After obtaining the list and information of fifteen additional experts, by considering of their qualifications ten persons were selected. In total there were thirty persons,



twenty alumni and ten nominated research subjects, were qualified as the experts and were invited to take part in this study.

Two month later, invitation was conducted by many channels including email, phone call, face-to-face with all potential participants. Depending on Delphi technique, it can be time consuming as a way to get the opinion from the experts until gaining the unanimity through a multiple rounds of questionnaire surveys. That called for the careful retention of participants. Therefore, the invitation not only stated research objectives and expert criteria but also provided the detail outline of what will be required in each phase in order to make sure that the invitees understood and were willing to engage in all phases of this study. Moreover, they were asked to assess themselves whether they were qualified as the experts in IT governance area. This approach could help to increase the validity of expert identification.

In December 2014, twenty proposed participants responded to contribute in this research study. Semi-structured interview was set up and an interview guide was provided to all participants before the interview session. However, only nineteen responded participants confirmed to attend the interview. Subsequently the confirmed participants in this study will be mentioned as Participant no.1 to Participant no.19.

Participant no.1 works in a well-known hospital group in Thailand. This hospital group is one of the largest hospitals in Southeast Asia. His current position is deputy managing director in charge of research and innovation. He in charge in formulating and implementing IT strategies and IT projects for hospital chain. He had knowledge in many IT frameworks including IT governance field because his company has to comply with many standards. He had 15 years of IT management experience.

Participant no.2 is a professor in a famous university in Thailand. He teaches in IT management field for bachelor and master degrees. He used to work in many large multinational IT corporations. This participant used to be an executive who had experience in managing companies in many key industries such as manufacturing, retail, distribution, travel & transportation across Asia. He received his doctor degree and had more than 10 years of IT management experience.

Participant no.3 is an assistant vice president in a well-known food company in Thailand. He is responsible for IT of headquarter and all seven branches across the country. He has knowledge in IT governance framework and he also applied it to improve efficiency and productivity of IT. He graduated two bachelor degrees in computer science and one master degree in Management Information System. His background experience is on software development and project management in many industries such as telecommunication and automobile.

Participant no.4 is an IT expert in a well-known university in Thailand. He graduated master degree from England and has a good skill in networking and security. He is a project manager of IT governance project for the university. He supported his subordinate in training IT governance concept and many IT governance frameworks. With his dedication, university got certified in ISO27000 (security management) and successful in ITIL (IT service management) implementation.

Participant no.5 is a lecturer in a university. He has very knowledge in IT governance filed as he graduated doctoral degree which his research was specially focused on IT governance area. He had work experience in technology company in USA and communication company in Thailand. He has worked as IT consultant in many companies and government units.

Participant no.6 is a head of analytics in digital business. He graduated two bachelor degree in Engineer and Accountancy, two master degree in Management Information System and Accountancy and one doctoral degree. He has extensive knowledge in IT including IT governance. He has much experience in IT consulting with many firms in various industries. He was a lecture for bachelor and master degree in many universities. He is now a head of business analytics team.

Participant no.7 is a director of enterprise risk services in top-five worldwide auditing firms. She had more than ten-year experience in IT audit and consulting to many corporates in many industries. It is necessary for IT auditor to understand well in IT governance standard that encouraged her to learn more in this field. Currently she is studying a doctoral degree in Accounting and she also interests in governance area.

Participant no.8 is an IT consultant. She graduated a doctoral degree, which her thesis was related to IT investment framework. She had consulting experiences in many IT companies both in public and private sectors. Her specialist is in IT management and IT strategic planning that requires IT governance concept to design IT master plan. She also shared her knowledge and experience by being a lecture and guest speaker in many universities.

Participant no.9 is a lecturer and assistant director for planning in a well-known university. He graduated a master degree from a famous university in USA and a doctoral degree in Thailand. He used to be an Assistant Chief of Information Technology in his university. During that time, he had to design IT strategy and implement IT governance framework for the university. He also had an experience in developing IT master plan for many organizations in public sector.

Participant no.10 is an IT director of one of the top-five audit and consulting worldwide companies. He is responsible for IT operation, supporting and planning IT direction for his organization. He graduated a master degree in engineering and has been worked in IT field for more than twenty years. According to his responsibility, he had to serve all auditors and consultants that called for adopting new technologies and updated IT standards. Such responsibilities stimulated him to learn more in IT standard and frameworks. He attended many training courses in IT governance and he also implemented it in his company.

Participant no.11 is a vice president in IT in the biggest sugar and bio-energy producer company group in Thailand. He graduated a master degree in Management Information System. He is responsible in directing IT strategy and managing IT to ensure the effective execution. He has a good knowledge in IT management and governance as he was an IT executive in a leading business company, which adhered to adopt corporate governance concept to run the business.

Participant no.12 is a head of group accounting and controlling, risk management and process improvement in the biggest frozen seafood product company group in Thailand. She graduated a master degree in Accounting Information

System and she was an auditor in one of the top five audit and consulting worldwide companies for ten years. She had much experience in IT auditing with many clients from various industries not only companies in Thailand but also international firms in USA and Canada.

Participant no.13 is a business transformation manager in international insurance company. She graduated a master degree in Management Information System. She is in charge of developing key work streams for business improvement by using IT. Her job requires wide-ranging knowledge on how to implement IT process to enable a business to perform to its optimum ability. The company provided her many training courses not only in Thailand but also aboard to support her tasks.

Participant no.14 is a project principle manager. He is responsible for directing and controlling of projects in Thailand and abroad. He graduated a master degree in Information System from Australia. He had professional experience in Enterprise Resource Planning (ERP) implementation with many clients in AEC (ASEAN Economic Community). He was an IT consultant in transforming business process by using best practice from IT application.

Participant no.15 is an IT audit director in one of the leading banks in Thailand. He graduated a master degree and got international auditing certification. He was an auditor in one of the top five worldwide auditing firms for many years. He had professional experience in internal control especially in IT. He is in charge of coordinating and driving the accomplishment of IT control. He is also a tutor for international auditor examination and guest speaker in IT governance issue for many associations and universities.

Participant no.16 is a vice president of IT in one of the leading banks in Thailand. He graduated a doctoral degree. He is responsible for providing technology vision and strategic direction. He is a committee of Thailand Information Security Association. He had experience in IT especially in financial industry for almost twenty years. He also advocated his knowledge and professional experience by giving lectures for many universities.

Participant no.17 is an assistant IT director in one of the government offices. She had high experience in IT. She managed many IT projects and development IT services to serve all business units across Thailand and 15 oversea brunches. She graduated bachelor degree and she always attended IT training courses to update her knowledge. One of those courses was a special IT governance training course for executive which provided an opportunity to observe IT governance in practice with IT companies in USA.

Participant no.18 is an assistant vice president of application development standard and support in one of the famous telecommunication companies in Thailand. She graduated a master degree and got many IT certificates. She is responsible for selecting the appropriate technology and IT standard for new application developments or acquisitions to fit with the organization. She has been working in telecommunication area for more than thirty years.

Participant no.19 is a service delivery manager in a multi-national corporation that offers solutions and consulting IT services. He graduated a master degree and got many training courses in IT service management and IT governance. He had experience in supporting and consulting his clients to improve IT efficiency particularly in financial industry, which need to comply with many IT governance frameworks to achieve international and banking standards.

According to Delphi technique, expert anonymity has to be followed. Thus, this study can only provide brief information of each participant. All nineteen participants who took part in this research study were qualified experts. They were from different organizations and had various experience backgrounds. Their demographic data and experiences are shown in Table 3-3.

Table 3-3: Participants' Demographic Data and Experiences

| Participant | Gender | Job Titel   | Education Level | Age (Year) | Year of Experience (IT governance and Management) | Industry Experience |                  |            |             |          |          |         |            |
|-------------|--------|---|-----------------|------------|---|---------------------|------------------|------------|-------------|----------|----------|---------|------------|
|             |        |   |                 |            |   | Agribusiness        | Consumer Product | Financials | Industrials | Property | Resource | Service | Technology |
| No.1        | Male   | Managing Director   | Master Degree   | 41-45      | 11-15   |                     |                  |            |             |          |          | X       | X          |
| No.2        | Male   | Professor   | Doctoral Degree | 41-45      | 6-10  |                     |                  |            |             |          |          | X       | X          |
| No.3        | Male   | Assistant Vice President of IT  | Master Degree   | 36-40      | 6-10  | X                   |                  |            | X           |          |          |         | X          |
| No.4        | Male   | Acting for IT Director  | Master Degree   | 41-45      | 11-15   |                     |                  |            |             |          |          | X       | X          |
| No.5        | Male   | Professor   | Doctoral Degree | 36-40      | 6-10  |                     |                  |            |             |          |          | X       | X          |
| No.6        | Male   | Head of Analytics in Digital Business   | Doctoral Degree | 36-40      | 11-15   |                     |                  | X          | X           | X        | X        | X       | X          |
| No.7        | Female | Director Enterprise Risk Services   | Master Degree   | 41-45      | 11-15   |                     | X                | X          | X           |          | X        | X       |            |
| No.8        | Female | IT-Business Consultant  | Doctoral Degree | 36-40      | 11-15   |                     |                  | X          |             |          | X        | X       |            |
| No.9        | Male   | Professor & Assistant Rector for Planning   | Doctoral Degree | 36-40      | 11-15   |                     |                  |            |             |          |          | X       | X          |
| No.10       | Male   | IT Director   | Master Degree   | 46-50      | 16-20   |                     |                  | X          |             |          |          | X       |            |
| No.11       | Male   | Vice President of IT  | Master Degree   | 46-50      | 11-15   | X                   |                  |            | X           |          | X        | X       |            |
| No.12       | Female | Head of Group Accounting and Controlling, Risk Management and Process Improvement | Master Degree   | 36-40      | 11-15   | X                   | X                | X          | X           | X        | X        | X       | X          |
| No.13       | Female | Business Transformation Manager   | Master Degree   | 41-45      | 11-15   | X                   |                  | X          |             |          |          |         | X          |
| No.14       | Male   | Project Principle Manager   | Master Degree   | 41-45      | 11-15   |                     |                  |            |             |          |          | X       | X          |
| No.15       | Male   | IT Audit Director   | Master Degree   | 46-50      | 16-20   |                     |                  | X          |             |          |          |         |            |
| No.16       | Male   | Vice President of IT  | Doctoral Degree | 46-50      | 16-20   |                     |                  | X          |             |          |          |         | X          |
| No.17       | Female | Assistant IT Director   | Bachelor Degree | 51-55      | 26-30   |                     |                  |            |             |          |          | X       |            |
| No.18       | Female | Assistant Vice President of Application Development Standard and                  | Master Degree   | 51-55      | 26-30   |                     |                  |            |             |          |          | X       | X          |
| No.19       | Male   | Service Delivery Manager  | Master Degree   | 36-40      | 6-10  |                     |                  | X          |             |          |          |         | X          |

All participants had experience in IT management for more than 10 years. Their positions were in either executive or management level. Their education levels were mostly higher than Master degree. They had variety of background industry experience

that can produce wide-range of attitudes and opinions. They worked in different company, which covered both public and private sectors.

From January to March 2015, the semi-structured interviews were held with each participant. The interview guide (Appendix A) was formulated based on an extensive review of the literature. Each interview session took approximate 90 minutes. With the permission of the participants, the interview sessions were audio recorded, observation noted and then content transcribed. Follow-up email and the telephone were used to clarify the interview context. Subsequent by data analyzing and the finding from this phase are described in section 4.1.

### 3.5.2 Phase 2: Determining the Important Factors

This phase aims to determine the most important factors that can be used to select each IT governance process. Questionnaire (Appendix B) was designed into two parts. The first part presented the first phase result. Participants were asked to review and reconsider their own response. The other part provided a list of factors based on the first phase result. Respondents were asked to evaluate which factors had the influence in selecting each IT governance process.

In May 2015, the questionnaire and explanation was sent to all participants via email. Follow-up phone call was conducted to ensure that they understand the questionnaire clearly. One month later, all participants submitted their responses. Researcher analyzed and converted the collected information into a well-structured questionnaire for conducting a new survey in the subsequent phase.

### 3.5.3 Phase 3: Ranking the Factors

This phase begins the initial iteration round until the final round when it came into a greater consensus from all participants. In August 2015, researcher provided a questionnaire (Appendix C) that included summarized responses from the previous phase and a list of factors that influenced IT governance processes selection.

Participants were asked to assign a rank, a numerical value, to each factor. The response choice range was from very influence to less influence. The feedback was collected and analyzed in October 2015. The principle of Delphi technique is

conceived as a way to obtain the opinion of experts in order to gain unanimity through a multiple-rounds of questionnaire surveys usually two or three rounds which depends on the result of each round (Hanafin, 2004). In this study, one more round was necessary because the result from the previous round had not been achieved consensus. The next round questionnaire was designed by synthesis data from all previous phases and focused in more detail to evaluate influence of each factor to each IT governance process in order to acquire deeper and richer insights.

In November 2015, the questionnaire (Appendix D) was delivered to all participants by email. Phone call was used to explain the reasons and objectives of this survey round. They were asked to categorize factors in terms of their important relative to the influence in selecting each IT governance process by using four-point Likert scale range from no influence to most influence. One month later, ten respondents returned their answers by email. Gentle reminder emails were sent to the rest participants. In December 2015, there were five participants who still did not return their feedbacks. Follow up email or phone call were used to remind them again. Finally, all nineteen responses were completely collected in January 2016. Data were analyzed by following Delphi measuring method. The result from this survey round reached the consensus criteria; all respondents had unified opinion among group. Summarize of final result expresses in the next chapter.

#### 3.5.4 Phase 4: Formulating and Validating the Guideline

The final phase aims to develop a guideline for IT governance processes selection. All data were incorporated and analyzed to formulate a guideline by using statistical technique. Clustering analysis was used to grouping a set of IT governance processes and classified them into scenarios. In order to ensure that the guideline is valid and practicable, another group of expert was brought to be a validator. In this study, a validator is a person who is widely recognized as IT governance expert in IT industry in Thailand. High experience and contribution related to IT governance filed were considered important in selecting the validators in this study. Three persons were included as validators in this research.



The first validator is a director in one of the top five worldwide auditing firms. She is the executive member in ISACA (Information Systems Audit and Control) Thailand Chapter. ISACA is an independent, nonprofit global association that engages in the development, adoption and use of globally accepted, industry-leading knowledge and practices for information systems. COBIT5 in Thai version was translated and reviewed by her team. Her contribution in IT governance is widely recognized as she was invited as a lecturer for many organizations and universities. She also the author of many articles on IT governance.

The second validator is a managing director of an IT company. He was a vice chairman in itSMF (IT Service Management Forum) Thailand chapter. The itSMF is a non-profit organization established to develop and promote IT Service Management. He has high experience in IT governance and IT service area as implementer, consultant and trainer. He also gave lecture about IT governance and IT service management for many universities and companies.

The third validator is a senior head of technology partner management department of one of the leading banks in Thailand. He has a high experience in IT governance framework especially in service area. He established IT service desk department and adopted IT governance framework to determine and drive IT process. He used to work as an executive management in construction business which has a famous in running business using governance concept. He also educated many organizations and universities about IT governance principle and sharing his experience in IT governance project.

In March 2016, the invitation was sent to all validators by formal email, which explained research objective and process as well as a request for making an appointment. Between April and May 2016, a face-to-face interview was held with each validator and it took around one hour for the interview session. The interview session started by presenting the problem statement, research objectives, methodology and results from each phase. Then the guideline, which is the ultimate outcome of this research, was presented and then asked the validator for his or her comments and

suggestions. Finally, their opinions and recommendations were summarized as explained in the next chapter.

### 3.6 Data Analysis

The nature of Delphi technique expedites iteration processes until gaining the consensual opinion from a group of experts. Consensus means the answers or opinions are agreeable among respondents. There are many approaches to measure consensus in Delphi technique. Generally, descriptive statistic is commonly used to define and assess agreement in Delphi technique (Hasson, Keeney, & McKenna, 2000). Mean, median, and mode scores are used to describe a central tendency of data set while standard deviation (SD) and interquartile range (IR) are used to measure of variability or dispersion.

For Likert-type scale, consensus is commonly calculated by using interquartile range (Jones & Hunter, 1995). Interquartile range (IR) is a measure of the middle point in a data set by finding the distance between the 25<sup>th</sup> percentile and the 75<sup>th</sup> percentile values in opinion. Consensus criteria varies from study to study. One criterion suggested that consensus is achieved by having interquartile range is less than 2.5 (Kittell-Limerick, 2005). Scheibe, Skutsch, and Schofer (2002) claimed that consensus reached when interquartile range is no larger than 2. Furthermore, some studies added that the interquartile range needs to be below 1 on seven-point Likert scale, which means more than 50% of all opinion falls within one point on scale (Linstone & Turoff, 1975; Rayens & Hahn, 2000). The IR value ranges from 0 to 3 with 0 indicating most agreement and 3 indicating least agreement (Raskin, 1994). However, Giannarou and Zervas (2014) recommended to use combination measurement, not only concern interquartile range value but also regard standard deviation to represent consensus in Delphi technique. Standard deviation is often used to assess agreement and the criterion less than 1.5 is used to determine consensus (Christie & Barela, 2005).

For ranking scale, Kendall's coefficient of concordance (W) has been widely recognized to assess a consensus for Delphi technique (Schmidt, 1997). Kendall's W coefficient is a non-parametric statistic for assessing agreement among rankers that is

calculated on an ordinal scale or an interval scale and its value is calculated according to the following formula (Kendall, 1948):

$$W = \frac{12R}{m^2(k^3 - k)}$$

where

$m$  - the number of rater

$k$  - the number of ranked objects

$R$  - the ranks ascribed to the following objects ( $i = 1, 2, \dots, k$ ), independently for each rater.  $R$  value can be calculated by using following formula:

$$R = \sum_{i=1}^k (R_i - \bar{R})^2$$

Kendall's  $W$  coefficient can be used to evaluate agreement between 3 or more rankers. Its value ranges from 0 to 1, with 0 indicating no consensus and 1 indicating perfect consensus between lists (Kendall, 1948). If Kendall's  $W$  coefficient value is less than 0.7, the ranking questionnaires have to be resent to all participants. (Schmidt, 1997). The chi-square test, which is used to determine a significant difference between the expected frequencies and the observed frequencies, can be used to support for the Kendall's coefficient of concordance if the sample size is not too small or less than seven raters (Wallis, 1939).

In case that the result is not a consensus, the participants will be asked to offer brief explanations and recommendations for each factor. This information will help to refine the next questionnaire. In other words, the reiterations will continue until reaching the consensus.

### 3.7 Summary

This chapter established the methodological foundations for this research. It provides a detailed explanation of the research method including qualitative method and Delphi technique. Research design and the details of each step in collecting and

analyzing data were presented. To achieve the research objective, this study employed not only three main phases of Delphi technique but also extended one more phase, which is formulating and validating the guideline, to increase the reliability of the results, which is the suggested guideline.

Delphi technique is a versatile research tool that is considered as the best appropriate methodology for this research as it consists of a systematic method for gathering the in-depth attitude and soliciting the idea from a group of experts in the domain of IT governance. The outcome from this technique will express the credibility and reliability as Delphi mechanism provides deeper analysis of the individual judgment among a group of experts and gives an opportunity for all respondents to reconsider and review their feedbacks in multistage surveys.



## Chapter 4 Result

The aim of this study is to investigate what and how contingency factors influence IT governance processes selection. This research applied qualitative method by using Delphi technique as the main research methodology. Delphi technique is appropriate for evaluation study as it requires a group of experts to response a survey and subsequently receive feedback in the form of a statistical representation of the group response (Linstone & Turoff, 1975). This research procedure is classified into four phases. Three phases were conducted to enquire opinions and examine agreement on determinants of IT governance process selection. The last phase intended to obtain a validity of the guideline formulated and research findings.

This chapter presents research finding obtained through the four phases of research procedure. Base on Delphi technique, interview and iterative survey were used to gather the data. First phase started with interview to explore factors and perceptions of IT governance processes from experts. It aimed to draw the opinions from experts who have well-knowledge, deep understanding and experience in IT governance and IT management area. Nineteen IT executives and IT managers who involved with IT governance implementation were selected as the experts for this study. All participants were qualified as the expert according to this research criterion. They were from different organizations with anonymousness. In December 2014, researcher interviewed each participant in the first phase. Feedbacks from the first phase were used to form a questionnaire for survey in the following phases. The second phase started in May 2015 to determine the most important factors to be selected for each IT governance process. The third phase aimed to rank the influenced factors and the reiterated surveys were conducted in October 2015. Two survey rounds were conducted until stability in the responses was attained. The last phase, formulating and validating the guideline, was executed in January 2016. Another group of experts was invited to take part as the research subjects to verify the result and finding from the previous phases in order to ensure that the guideline is valid and practicable for using in the real world businesses. Three validators were selected based

on their high experience in IT governance and well recognized in IT industry in Thailand. The result and the finding from each phase presents in following section.

#### **4.1 Phase 1: Discovery Factors**

The first phase aims to discover the factors related to IT governance processes selection. Emerging factors from this phase finding would be used to design the questionnaire for next phase. Interview is an inductive approach that appropriate to generate the initial idea from group of participants. Key strength of Delphi technique is anonymity that protects participant's identity. It allows participants to feel free in sharing and expressing their opinions. This study promised with nineteen participants about the level of anonymity. Only general information, for example job title, age, gender, education level and industry experience, will provide to identify participant qualification. Table 4-1 displays the summary of nineteen participants' characteristics.



Table 4-1: Participant Characteristic Summarization

| Gender           | Frequency | Percent      |
|------------------|-----------|--------------|
| Female           | 6         | 31.6         |
| Male             | 13        | 68.4         |
| <b>Total</b>     | <b>19</b> | <b>100.0</b> |
| Age (Year)       | Frequency | Percent      |
| 36-40            | 7         | 36.8         |
| 41-45            | 6         | 31.6         |
| 46-50            | 4         | 21.1         |
| 51-55            | 2         | 10.5         |
| <b>Total</b>     | <b>19</b> | <b>100.0</b> |
| Experience(Year) | Frequency | Percent      |
| 6-10             | 4         | 21.1         |
| 11-15            | 10        | 52.6         |
| 16-20            | 3         | 15.8         |
| 26-30            | 1         | 5.3          |
| >30              | 1         | 5.3          |
| <b>Total</b>     | <b>19</b> | <b>100.0</b> |
| Education Level  | Frequency | Percent      |
| Bachelor Degree  | 1         | 5.3          |
| Master Degree    | 12        | 63.2         |
| Doctoral Degree  | 6         | 31.6         |
| <b>Total</b>     | <b>19</b> | <b>100.0</b> |

Nineteen participants were mostly male, 13 out of 19, with average age was in the range of 36-40 years. Most of them graduated master degrees. They all had high experience in IT governance and management on the average of more than ten years. The brief profile, demographic data and experiences, was explained in section 3.5.1.

Semi-structured interview was conducted with individual participant. As participant were in executive and top management level so the interview time was quite limited. To collect related factors and perception of IT governance processes, an interview guide was designed by concerning of this research purpose. The following research question was used to frame the interview guide.

*Q1: What contingency factors influence the selection of IT governance processes?*

To address this research question, the interview question (Appendix A) was design by separating into two parts. One focused on the perception of IT governance processes. The other emphasized on factors related to IT governance processed selection. There were a lot of questions and some complicated terminologies and many definitions that need explanation during the interview session. In order to conduct interview smoothly and achieve all expectations, the interview guide was sent to all participants beforehand via email.

The interview started with a brief introduction of the researcher profile. Then the researcher explained the research objectives and data collection procedure of each phase to ensure that the participant was understand their contributions and willing to attend in this research study because they had to take part in many survey rounds. Next, the researcher explained meaning and giving some examples of eighteen IT governance processes to avoid misunderstanding in this research context. Then, the researcher asked them to evaluate the perception of each IT governance process. Participants were invited to respond by scaling each IT governance process on degree of implementation, importance and impact to business-IT alignment. Subsequently, seven factors were asked with open-ended questions to obtain comments on each factor from participants. The result of this phase presented in each part as followed.

#### 4.1.1 Part 1: IT Governance Perception

In the first part of the interview session, researcher explained all participants about the meaning of each IT governance process in order to avoid ambiguous context. This research applied perception concept to understand the



selection logic in IT governance context. Three components from perception concept were modified in IT governance area including implementation, importance, and business-IT alignment. All participants were asked to express their perception of each IT governance process according to the three components.

The first component is implementation that aimed to inquire the respondent's experience in each IT governance process implementation. After explained the details and gave them an example of each IT governance process, they were requested to evaluate their experience in each IT governance process implementation whether organizations interested in adoption or not. The responses are implemented and not implemented. Table 4-2 displayed the findings, percentage of implementation, of each IT governance processes.

Table 4-2: Percentage of Implementation

| No | IT Governance Processes                             | Implemented | Not Implemented |
|----|---|-------------|-----------------|
| 1  | Ensure Governance Framework Setting and Maintenance | 84%         | 16%             |
| 2  | Ensure Benefits Delivery                            | 63%         | 37%             |
| 3  | Ensure Risk Optimisation                            | 84%         | 16%             |
| 4  | Ensure Resource Optimisation                        | 84%         | 16%             |
| 5  | Ensure Stakeholder Transparency                     | 42%         | 58%             |
| 6  | Manage the IT Management Framework                  | 79%         | 21%             |
| 7  | Manage Strategy                                     | 84%         | 16%             |
| 8  | Manage Enterprise Architecture                      | 42%         | 58%             |
| 9  | Manage Innovation                                   | 63%         | 37%             |
| 10 | Manage Portfolio                                    | 53%         | 47%             |
| 11 | Manage Budget and Costs                             | 89%         | 11%             |
| 12 | Manage Human Resources                              | 89%         | 11%             |
| 13 | Manage Relationships                                | 79%         | 21%             |
| 14 | Manage Service Agreements                           | 89%         | 11%             |
| 15 | Manage Suppliers                                    | 79%         | 21%             |
| 16 | Manage Quality                                      | 79%         | 21%             |
| 17 | Manage Risk   | 74%         | 26%             |
| 18 | Manage Security                                     | 89%         | 11%             |

Based on the response, there were four IT governance processes (No.11: Manage Budget and Cost, No.12: Manage Human Resources, No.14: Manage Service

Agreement and No.18: Manage Security) got the highest scores. These four processes were the most implemented processes based on the experiences of seventeen participants who involved in these processes implementation at the response of 89%. Meanwhile, there were two IT governance processes (No.5: Ensure Stakeholder Transparency, and No.8: Manage Enterprise Architecture) seldom implemented.

There was not any IT governance process implemented from the answer of all participants. From the finding showed that organizations select to implement just some IT governance processes instead of all IT governance processes at once. Some participants explained the reason why organizations in Thailand did not implement all IT governance processes at once as the following quotes.

*“Based on my experience, selecting these IT governance processes mostly depends on consultant’s recommendation. Big organizations in Thailand usually hire consultants from audit firm. Consultants do the assessment of the current state, analyze the gap and prioritize which IT governance processes will appropriate with their client organization. These IT governance processes are important but to adopt all processes at the same time is hardly possible. Even big organizations have to assess their as-is state, create awareness, educate their staff and make a decision which IT governance processes should start first. ...For instance, even though there is a big concern on “Ensure benefits delivery”, it is difficult to implement. That is why not many organizations adopted this process. Because on post implementation stage, nobody cares what is the benefit or profit. They just want to make sure that the new system is usable with zero defect, that’s it...” (Participant No.1)*

*“I gave an advice for many clients, it is hardly to implement all these processes. It is hardly happened indeed even these processes are essential for organizations. Some organization has limited budget. Some has insufficient resource especially man power because they have to focus on IT operation such as day to day job, support all requirements, help desk, monitor network and system. It sounds easy to implement governance of*

*IT but it quite hard to do because there are many constraints for each organization. I suggested them to prioritize which processes are really important ones.” (Participant No. 7)*

As quotes above, the participants described that organizations did not implement all eighteen IT governance processes at once because it required a large effort, budget, time and resource. Instead they selected only some IT governance processes to be implemented concerning to their limitation and criteria.

The second component is important since it emphasized the importance level of each IT governance process. Literature suggested that IT governance is important but it did not define important level for each IT governance process. In order to assess importance perceptions of IT governance processes, three Likert scale (low, medium, and high) were used to quantify the levels of importance to organization. The researcher requested participants to evaluate the importance level of each IT governance process and the result are shown in Table 4-3.

Table 4-3: Percentage of Importance level to organization

| No | IT Governance Processes                             | High Level | Medium Level | Low Level |
|----|---|------------|--------------|-----------|
| 1  | Ensure Governance Framework Setting and Maintenance | 89%        | 11%          | 0%        |
| 2  | Ensure Benefits Delivery                            | 74%        | 21%          | 5%        |
| 3  | Ensure Risk Optimisation                            | 63%        | 32%          | 5%        |
| 4  | Ensure Resource Optimisation                        | 42%        | 53%          | 5%        |
| 5  | Ensure Stakeholder Transparency                     | 53%        | 42%          | 5%        |
| 6  | Manage the IT Management Framework                  | 79%        | 21%          | 0%        |
| 7  | Manage Strategy                                     | 74%        | 26%          | 0%        |
| 8  | Manage Enterprise Architecture                      | 58%        | 32%          | 11%       |
| 9  | Manage Innovation                                   | 21%        | 68%          | 11%       |
| 10 | Manage Portfolio                                    | 42%        | 42%          | 16%       |
| 11 | Manage Budget and Costs                             | 68%        | 32%          | 0%        |
| 12 | Manage Human Resources                              | 63%        | 32%          | 5%        |
| 13 | Manage Relationships                                | 63%        | 21%          | 16%       |
| 14 | Manage Service Agreements                           | 68%        | 32%          | 0%        |
| 15 | Manage Suppliers                                    | 58%        | 32%          | 11%       |
| 16 | Manage Quality                                      | 58%        | 37%          | 5%        |
| 17 | Manage Risk   | 68%        | 32%          | 0%        |
| 18 | Manage Security                                     | 79%        | 21%          | 0%        |

According to the results, it revealed that the most important process was “No. 1: Ensure governance framework setting and maintenance”, which seventeen participants, 89%, ranked it in high important level. The less important process was “No.10: Manage portfolio”, which 16% of the respondents ranked it in low important level. In fact, this process, “No. 10: Manage portfolio”, had diverse results. Eight participants, 42%, evaluated it in high important level, also eight participants, 42%, valued it in medium level, and two participants weighted it in low important level. Although each participant evaluated each process in different level but most of IT governance processes importance are in high and medium important levels.

The third component is business-IT alignment that focused to the impact level that each IT governance process could support organizations to achieve business-IT alignment. To quantify the levels of important, three Likert scale was used to determine the magnitude level. The choices are “low support level”, “medium support level” and “high support level”. The respondents assessed the supporting level of each IT governance process in achieving business-IT alignment and the results are shown in Table 4-4.

Table 4-4: Percentage of Business-IT Alignment level

| No | IT Governance Processes                             | High Level | Medium Level | Low Level |
|----|---|------------|--------------|-----------|
| 1  | Ensure Governance Framework Setting and Maintenance | 68%        | 21%          | 11%       |
| 2  | Ensure Benefits Delivery                            | 79%        | 5%           | 16%       |
| 3  | Ensure Risk Optimisation                            | 42%        | 37%          | 21%       |
| 4  | Ensure Resource Optimisation                        | 47%        | 37%          | 16%       |
| 5  | Ensure Stakeholder Transparency                     | 37%        | 53%          | 11%       |
| 6  | Manage the IT Management Framework                  | 79%        | 16%          | 5%        |
| 7  | Manage Strategy                                     | 74%        | 26%          | 0%        |
| 8  | Manage Enterprise Architecture                      | 63%        | 26%          | 11%       |
| 9  | Manage Innovation                                   | 21%        | 42%          | 37%       |
| 10 | Manage Portfolio                                    | 47%        | 26%          | 26%       |
| 11 | Manage Budget and Costs                             | 53%        | 32%          | 16%       |
| 12 | Manage Human Resources                              | 53%        | 32%          | 16%       |
| 13 | Manage Relationships                                | 58%        | 32%          | 11%       |
| 14 | Manage Service Agreements                           | 58%        | 37%          | 5%        |
| 15 | Manage Suppliers                                    | 26%        | 47%          | 26%       |
| 16 | Manage Quality                                      | 32%        | 47%          | 21%       |
| 17 | Manage Risk   | 37%        | 37%          | 26%       |
| 18 | Manage Security                                     | 42%        | 37%          | 21%       |

According to the results, it revealed that each IT governance process fostering business-IT alignment are dispersed among the three different levels. Two processes which most participants agreed to have high impact on business-IT alignment are “No 2.: Ensure Benefit Delivery” and “No. 6 Management the IT management framework”. There was one process that no one evaluated it in low level which is “No. 7: Manage Strategy”. They mentioned that corporate’s strategy is a key to define direction of business and IT. Participant No. 14 stated that if IT did not work well, business activity would in jeopardy. In order to align business and IT, organizations should manage strategy by concerning objective and direction of both business and IT.

To understand the overall perception of IT governance process, the researcher analyzed interrelation of all three components by focusing on the processes which were accepted to implement, high important level for organization, and high level of fostering business-IT alignment. As shown in Table 4-5, nineteen participants expressed similar view that mostly processes implemented were in high important level and high business-IT alignment supporting.

Table 4-5: Percentage of Perception

| No | IT Governance Processes                             | Implemented (Yes) | Important to Organization (High Level) | Business-IT Alignment (High Level) |
|----|---|-------------------|--|------------------------------------|
| 1  | Ensure Governance Framework Setting and Maintenance | 84%               | 89%                                    | 68%                                |
| 2  | Ensure Benefits Delivery                            | 63%               | 74%                                    | 79%                                |
| 3  | Ensure Risk Optimisation                            | 84%               | 63%                                    | 42%                                |
| 4  | Ensure Resource Optimisation                        | 84%               | 42%                                    | 47%                                |
| 5  | Ensure Stakeholder Transparency                     | 42%               | 53%                                    | 37%                                |
| 6  | Manage the IT Management Framework                  | 79%               | 79%                                    | 79%                                |
| 7  | Manage Strategy                                     | 84%               | 74%                                    | 74%                                |
| 8  | Manage Enterprise Architecture                      | 42%               | 58%                                    | 63%                                |
| 9  | Manage Innovation                                   | 63%               | 21%                                    | 21%                                |
| 10 | Manage Portfolio                                    | 53%               | 42%                                    | 47%                                |
| 11 | Manage Budget and Costs                             | 89%               | 68%                                    | 53%                                |
| 12 | Manage Human Resources                              | 89%               | 63%                                    | 53%                                |
| 13 | Manage Relationships                                | 79%               | 63%                                    | 58%                                |
| 14 | Manage Service Agreements                           | 89%               | 68%                                    | 58%                                |
| 15 | Manage Suppliers                                    | 79%               | 58%                                    | 26%                                |
| 16 | Manage Quality                                      | 79%               | 58%                                    | 32%                                |
| 17 | Manage Risk   | 74%               | 68%                                    | 37%                                |
| 18 | Manage Security                                     | 89%               | 79%                                    | 42%                                |

According to the results, there were some processes that the results are varied, for example, process No.18 (Manage security) was weighted as frequently implemented by 89% of the respondents and high important level for organization by 79%, but low percentage in business-IT alignment by 42%. There was a participant who gave an explanation as the quote below.

*“For bank industry, customer and account information including all transaction are extremely important and need the highest security and confidentiality to keep and maintain it. Security is the first process that need to implement in bank industry. We have to comply with many security standards in order to ensure our value information are protected. Sometime business side and user do not understand why they have change password every three months or cannot use thumb drive to save their file. We do not allow them to use external internet as well. Some transaction, our application need at least two bankers for authorization. We have to accepted in all complains about security protection. That why*

*people always say high in security usually comes with low flexibility.”*  
(Participant No. 18)

One more interesting process was No.8 (Manage enterprise architecture). It was valued as high important level for organization by 58% and could support to business-IT alignment by 63%, but seldom implemented by 42%. There was a participant gave an explanation as the quote below.

*“From my viewpoint, organizations implemented many processes but not all. To adopt these processes, organizations have to put more effort to do it, for example, processes number 8 which is “Manage Enterprise Architecture”. Many organizations did not aware and see it as the important process, so not many organizations put its implementation on top priority. In order to implement Enterprise Architecture (EA), organizations have to know their as-is architecture in order to plan their future architecture and continue to monitor and update the data...EA tool is too expensive.”* (Participant No. 2)

These finding reflected the perception of each IT governance process from nineteen respondents' attitudes. They provided a similar view that IT governance adoption is important for organization and can help to ensure business-IT alignment. However, each IT governance process had a dissimilar important and benefit level. Multiple views from them demonstrated varied and convergent finding. Some processes were highly accepted to implement but not have high important level for organization or could not have strong support to achieve business-IT alignment. On the other hand, some processes were seldom implemented but they were important to organization. In order to make a decision which is an appropriate process, it might be some related variables to the selection. The other part of the interview session was designed to explore those variables.

#### 4.1.2 Part 2: Related Factors

The last question in the interviewing session aimed to discover contingency factors that related to a selection of IT governance processes to be implemented. The

researcher explained the meaning of all seven contingency factors and asked the individual participant to respond which variables were related to the selection of IT governance processes. The response was either yes (related) or no (not related). The results shown in Table 4-6. Moreover, the participants were asked to describe their opinions on IT governance processes selection issues to support their answers. In addition, they were inquired to name additional factors that might relate to the selection of IT governance processes.

Table 4-6: Response to Contingency Factors

| Participant | Strategy | Structure | Size | Environment | Technology | Task | Culture |
|-------------|----------|-----------|------|-------------|------------|------|---------|
| 1           | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 2           | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 3           | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 4           | Yes      | No        | No   | Yes         | No         | Yes  | Yes     |
| 5           | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 6           | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 7           | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 8           | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 9           | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 10          | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 11          | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 12          | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 13          | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 14          | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 15          | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 16          | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 17          | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 18          | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| 19          | Yes      | Yes       | Yes  | Yes         | Yes        | Yes  | Yes     |
| Total       | 100%     | 95%       | 95%  | 100%        | 95%        | 100% | 100%    |

The results were summarized based on the interview transcripts and field notes to identify the related variables response. From the finding, almost all participants agreed that all seven contingency factors influenced the selection of IT governance processes. Some quotes below illustrated to support this finding.

*“I think strategy is the most related one. It determined the direction to all business unit including IT. Which IT governance processes will be implemented are based on organization strategies. Strategy is a driver that*



*can control or define direction and objectives to all unit” (Participant No.10)*

*“Sometimes it depends on organizational structure. If the company is managed as a family business, the driving force comes from what the company owners see it as a fit process. Then we have to implement it.” (Participant No.3)*

*“Yes, I think firm size is a determinant of IT governance process selection. Generally, big firms have to implement various IT governance processes more than small firms. Because large firms need more internal processes to control and manage their effectively and efficiently of IT” (Participant No.14)*

*“Banking and financial companies have many rules and regulations to comply. External environment forces them to use these IT governance processes.” (Participant No.12)*

*“Sure, technology is influence to select IT governance process. Normally, technology always changes and updates. IT people has to improve their process to control all vulnerable points.” (Participant No.11)*

*“If main company task depends on heavily IT, such as telecommunication and banking industries, IT has to be managed effectively with well governance that requires to implement these processes.” (Participant No.19)*

*“Culture is also an important variable. Some conservative organizations do not want to change or improve any new process. They want to work as day to day operation. People always resist to any change. Implement such a IT governance process need a lot of afford. If organizational culture is unchangeable, IT governance project is highly risk to failure.” (Participant No.13)*

However, there was one participant discussed that not all seven factors were significant. Participant No. 4 claimed that three variables, which were structure,

size and technology, did not much relate to IT governance processes selection. Most participants were agreed that all seven contingency factors were related to IT governance process selection. The researcher used this finding to frame the questions for following phase.

#### **4.2 Phase 2: Determining the Important Factors**

The purpose of this phase is to determine the important level of each factor. The finding from the previous phase revealed that all seven contingency factors were significantly influence to IT governance processes selection. This finding was used to design the questionnaire to address this phase's objective. The question was framed by combining eighteen IT governance processes with seven factors to gather idea of each influenced factor. A structured electronic questionnaire was designed to offer a convenience way for participants to return the response through email. The questionnaire (Appendix B) was divided into two parts. The first part presented the results from the previous interview phase. The researcher requested participants to review and confirm their feedback from the previous interview session. The other part provided eighteen IT governance processes and asked each participant to choose which factors were related to the selection of that process.

An electronic questionnaire with instruction was sent to all participants via email. They were requested to respond the questionnaire according to their experience and opinion. Follow up by email and phone call were used because of the delay in receiving the feedback. Around one month, all nineteen participants submitted their responses back via email. The researcher analyzed and converted the collected data into a well-structured numeric codes. The results regarding factors related to IT governance processes selection are shown in Table 4-7.

Table 4-7: Frequency of IT governance processes of Each Contingency Factor

| Participant   | Strategy | Structure | Size | Environment | Technology | Task | Culture |
|---------------|----------|-----------|------|-------------|------------|------|---------|
| No.1          | 18       | 18        | 18   | 18          | 18         | 18   | 17      |
| No.2          | 9        | 10        | 17   | 7           | 10         | 9    | 15      |
| No.3          | 18       | 15        | 12   | 14          | 11         | 9    | 15      |
| No.4          | 16       | 0         | 0    | 5           | 0          | 2    | 3       |
| No.5          | 8        | 8         | 7    | 12          | 6          | 4    | 14      |
| No.6          | 8        | 5         | 9    | 4           | 4          | 7    | 11      |
| No.7          | 7        | 3         | 4    | 8           | 5          | 6    | 7       |
| No.8          | 17       | 6         | 2    | 14          | 8          | 8    | 7       |
| No.9          | 18       | 10        | 4    | 5           | 8          | 7    | 11      |
| No.10         | 17       | 4         | 2    | 3           | 4          | 6    | 1       |
| No.11         | 18       | 12        | 3    | 13          | 11         | 9    | 11      |
| No.12         | 13       | 12        | 11   | 9           | 4          | 6    | 17      |
| No.13         | 16       | 4         | 9    | 9           | 12         | 10   | 2       |
| No.14         | 10       | 5         | 1    | 2           | 6          | 6    | 6       |
| No.15         | 18       | 18        | 18   | 15          | 18         | 18   | 17      |
| No.16         | 18       | 18        | 18   | 18          | 18         | 18   | 18      |
| No.17         | 15       | 11        | 7    | 10          | 14         | 12   | 12      |
| No.18         | 18       | 18        | 18   | 18          | 18         | 18   | 18      |
| No.19         | 18       | 18        | 18   | 18          | 18         | 18   | 16      |
| <b>Mean</b>   | 15       | 10        | 9    | 11          | 10         | 10   | 11      |
| <b>Median</b> | 17       | 10        | 9    | 10          | 10         | 9    | 12      |
| <b>Mode</b>   | 18       | 18        | 18   | 18          | 18         | 18   | 17      |
| <b>Max.</b>   | 18       | 18        | 18   | 18          | 18         | 18   | 18      |
| <b>Min.</b>   | 7        | 0         | 0    | 2           | 0          | 2    | 1       |
| <b>SD.</b>    | 4.1      | 6.0       | 6.7  | 5.4         | 5.8        | 5.3  | 5.6     |

According to the results, strategy was the most significant factor since it had the highest mean, 15 out of 18 processes. This highest score expressed that organizational strategy is a key to IT governance processes selection. Oppositely, size was the least significant factor since it had the lowest mean, 9 out of 18 processes. This less score declared that company size is not so important to IT governance processes selection. The rest factors also effected to IT governance processes selection in the same range. In order to get a better view of how each variable influences the IT governance processes selection, the spider graph of number of IT governance processes influenced by seven contingency factors is shown in Figure 4-1.



Figure 4-1: Contingency Variables Influence

This phase revealed the effect of contingency factors on the IT governance processes selection. However, participants identified dissimilar views that expressed by the high standard deviation values and wide range number of maximum and minimum. This finding could not consider for answering the first research question (Q1). Therefore, in order to address this research question, the next phase was designed to prioritize these factors and the iterative rounds of survey were conducted until the consensus result among the group of experts was obtained. The product of this phase was then used to structure the questionnaire for following phase.

### 4.3 Phase 3: Ranking the Factors

This phase began iterative rounds of survey to determine the priority of the contingency factors from the previous phase's findings. The questionnaire was created to identify influential level of contingency factors in order to answer the first research question (Q1). The survey with electronic questionnaire was executed in many rounds until the consensus result was gained from all participants.

#### 4.3.1 Round 1 of Phase 3

Prior phase found that all contingency factors were related to IT governance processes selection. Thus, the question was developed by listing seven contingency factors and participants were asked to rank the given list of the factors. The ranking

scores were from 1 to 7 with 1 indicating the most influence and 7 indicating the least influence. The electronic questionnaire (Appendix C) and instruction were sent to all participants via email. Responses were collected and analyzed using descriptive statistic as shown in Table 4-8.

Table 4-8: Ranking of Contingency Factors

| Participant          | Strategy    | Structure   | Size        | Environment | Technology  | Task        | Culture     |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| No.1                 | 1           | 6           | 2           | 4           | 3           | 7           | 5           |
| No.2                 | 1           | 4           | 5           | 2           | 7           | 6           | 3           |
| No.3                 | 1           | 5           | 7           | 6           | 4           | 3           | 2           |
| No.4                 | 1           | 3           | 5           | 2           | 7           | 6           | 4           |
| No.5                 | 4           | 2           | 6           | 3           | 7           | 5           | 1           |
| No.6                 | 1           | 4           | 2           | 3           | 6           | 7           | 5           |
| No.7                 | 1           | 3           | 7           | 6           | 4           | 5           | 2           |
| No.8                 | 1           | 2           | 5           | 4           | 6           | 3           | 7           |
| No.9                 | 1           | 3           | 7           | 6           | 5           | 4           | 2           |
| No.10                | 1           | 2           | 7           | 4           | 5           | 6           | 3           |
| No.11                | 1           | 5           | 7           | 4           | 2           | 3           | 6           |
| No.12                | 1           | 5           | 4           | 3           | 6           | 7           | 2           |
| No.13                | 1           | 5           | 2           | 3           | 4           | 6           | 7           |
| No.14                | 1           | 4           | 6           | 7           | 2           | 3           | 5           |
| No.15                | 3           | 4           | 6           | 7           | 1           | 2           | 5           |
| No.16                | 3           | 2           | 5           | 4           | 7           | 6           | 1           |
| No.17                | 1           | 4           | 6           | 7           | 3           | 5           | 2           |
| No.18                | 1           | 6           | 7           | 3           | 2           | 5           | 4           |
| No.19                | 1           | 2           | 3           | 5           | 4           | 6           | 7           |
| <b>R<sub>i</sub></b> | <b>26</b>   | <b>71</b>   | <b>99</b>   | <b>83</b>   | <b>85</b>   | <b>95</b>   | <b>73</b>   |
| <b>Mean</b>          | 1.37        | 3.74        | 5.21        | 4.37        | 4.47        | 5.00        | 3.84        |
| <b>Median</b>        | 1.00        | 4.00        | 6.00        | 4.00        | 4.00        | 5.00        | 4.00        |
| <b>Maximum</b>       | 4           | 6           | 7           | 7           | 7           | 7           | 7           |
| <b>Minimum</b>       | 1           | 2           | 2           | 2           | 1           | 2           | 1           |
| <b>SD.</b>           | <b>0.90</b> | <b>1.37</b> | <b>1.81</b> | <b>1.67</b> | <b>1.95</b> | <b>1.56</b> | <b>2.03</b> |

The rows in Table 4-8 represent participants and columns represent contingency factors. Each cell contains the level of how each contingency factor influence such IT governance process. This round had to calculate the concordance between nineteen participants in ranking the influence of seven contingency factors. In Delphi technique, Kendall's coefficient of concordance ( $W$ ) is used to assess a consensus for ranking type survey (Schmidt, 1997). Kendall's  $W$  was calculated for examine the level of agreement among nineteen respondents by using the following formula (Kendall, 1948).

$$W = \frac{12R}{m^2(k^3 - k)}$$

where

$m$  - the number of rater, which were number of participant = 19

$k$  - the number of ranked objects, which were number of variable = 7

$R$  - the ranks ascribed to the following objects ( $i = 1, 2, \dots, 7$ ), independently for each rater which can be calculated by using following formula:

$$R = \sum_{i=1}^K (R_i - \overline{R})^2$$

Each  $R_i$  values was calculated as shown in Table 4-8. Then the  $R$  value was summarized and the result was 3554. Kendall's  $W$  value was computed and the result was 0.35. Normally, Kendall's  $W$  value ranges from 0 to 1, where 0 means no agreements at all, and 1 represents perfect strong agreement (Kendall, 1948). Consensus is reached when Kendall's  $W$  coefficient value is less than 0.7 (Schmidt, 1997). The result of this survey round had Kendall's  $W$  value at 0.35 that indicated a weak degree of agreement.

According to Giannarou and Zervas (2014), using combination measurement can help to draw a valid conclusion of consensus. Standard deviation is often used to determine consensus if value is less than 1.5 (Christie & Barela, 2005). Concerning of this round's result in Table 4-8, only two variables had standard deviation (SD) below 1.5. It reflected that this survey round did not reach a consensus.

Based on the principal and characteristic of Delphi technique, the survey process is usually reiterated until consensual in the responses is attained. Thus, the researcher need to revise questionnaire and conduct more survey in subsequent round. The outcome of this round was used to frame the questionnaire for successive round.

#### 4.3.2 Round 2 of Phase 3

Before conduct one more survey round, the researcher reviewed feedback from previous round and found the divergent in ranking result. It encouraged researcher to explore and ask for more comments from participants about their judgment. Phone call was used to inquire insight opinion from respondents. They complained that it was hard to rank seven variables to all IT governance process because each process had different characteristic.

The researcher revised and redesign the question by concerning with each individual IT governance process instead of the overall of process. This round questionnaire (Appendix D) included eighteen IT governance processes, comprising of seven contingency variables and choice of four Likert scale range from no influence to high influence level. The electronic questionnaire was delivered to all participants by email. Follow by phone call to explain the reasons and objectives of this survey round. In this round, a follow up email and phone call were used to expedited the respondent in the delay of feedback. It took almost three months to collected completely all nineteen responses. They rated their agreement on each variable influence level categorized by each IT governance process. The researcher analyzed it by summaries number of IT governance process classified by influence level of each variable. The result shown in Table 4-9 where rows represented participant (No.1 to No.19) and columns represented seven contingency variables underlay with four Likert scale choice of influence to selection process. Each cell contained the number of process (from the total of eighteen process per variable).

Most importantly, the feedback from this round had to examine whether it was moving towards consensus. If consensus is attained, the summarize of the finding will conduct afterward. Response obtained from all participant was scaled a number of influence level from 1 (not influence) to 4 (High influence level). The mean score was calculated to assess the average influence level of each variable. Delphi studies generally use interquartile range (IR) to summarize the consensus (Jones & Hunter, 1995). The interquartile range value is calculated by subtraction of the 1<sup>st</sup> quartile (percentile25) from the 3<sup>rd</sup> quartile (percentile75). The researcher used IBM SPSS

Statistics version 23 to calculate the percentile value and Microsoft Excel used to compute interquartile range (IR) value. Table 4-10 presented the interquartile range and descriptive statistic of the finding.

Table 4-9: Frequency of each contingency variable influence to number of IT governance process classified by participant.

| Participant | Strategy  |            |             |             | Structure |            |             |             | Size      |            |             |             | Environment |            |             |             | Technology |            |             |             | Task      |            |             |             | Culture |    |    |    |
|-------------|-----------|------------|-------------|-------------|-----------|------------|-------------|-------------|-----------|------------|-------------|-------------|-------------|------------|-------------|-------------|------------|------------|-------------|-------------|-----------|------------|-------------|-------------|---------|----|----|----|
|             | 1<br>(No) | 2<br>(Low) | 3<br>(Med.) | 4<br>(High) | 1<br>(No) | 2<br>(Low) | 3<br>(Med.) | 4<br>(High) | 1<br>(No) | 2<br>(Low) | 3<br>(Med.) | 4<br>(High) | 1<br>(No)   | 2<br>(Low) | 3<br>(Med.) | 4<br>(High) | 1<br>(No)  | 2<br>(Low) | 3<br>(Med.) | 4<br>(High) | 1<br>(No) | 2<br>(Low) | 3<br>(Med.) | 4<br>(High) |         |    |    |    |
| No.1        | 0         | 5          | 6           | 7           | 0         | 7          | 6           | 5           | 0         | 11         | 2           | 5           | 0           | 4          | 9           | 5           | 0          | 5          | 3           | 10          | 0         | 12         | 5           | 1           | 1       | 14 | 0  | 3  |
| No.2        | 9         | 1          | 4           | 4           | 8         | 2          | 8           | 0           | 1         | 3          | 11          | 3           | 11          | 4          | 3           | 0           | 8          | 3          | 6           | 1           | 9         | 2          | 7           | 0           | 3       | 4  | 9  | 2  |
| No.3        | 0         | 3          | 5           | 10          | 3         | 3          | 8           | 4           | 6         | 8          | 3           | 1           | 4           | 3          | 8           | 3           | 7          | 0          | 9           | 2           | 9         | 3          | 2           | 4           | 3       | 5  | 5  | 5  |
| No.4        | 2         | 1          | 0           | 15          | 18        | 0          | 0           | 0           | 18        | 0          | 0           | 0           | 13          | 0          | 2           | 3           | 18         | 0          | 0           | 0           | 16        | 1          | 0           | 1           | 15      | 1  | 0  | 2  |
| No.5        | 10        | 3          | 2           | 3           | 10        | 2          | 3           | 3           | 11        | 2          | 2           | 3           | 6           | 3          | 7           | 2           | 12         | 1          | 3           | 2           | 14        | 2          | 2           | 0           | 4       | 1  | 6  | 7  |
| No.6        | 10        | 0          | 0           | 8           | 13        | 2          | 0           | 3           | 9         | 2          | 1           | 6           | 14          | 0          | 0           | 4           | 14         | 0          | 3           | 1           | 11        | 1          | 3           | 3           | 7       | 1  | 1  | 9  |
| No.7        | 11        | 0          | 0           | 7           | 15        | 1          | 1           | 1           | 14        | 1          | 1           | 2           | 10          | 2          | 4           | 2           | 13         | 0          | 2           | 3           | 12        | 0          | 2           | 4           | 11      | 2  | 3  | 2  |
| No.8        | 1         | 1          | 4           | 12          | 12        | 3          | 2           | 1           | 16        | 0          | 2           | 0           | 4           | 1          | 1           | 12          | 10         | 1          | 7           | 0           | 10        | 0          | 2           | 6           | 11      | 3  | 3  | 1  |
| No.9        | 0         | 0          | 0           | 18          | 8         | 0          | 4           | 6           | 14        | 0          | 4           | 0           | 13          | 0          | 4           | 1           | 10         | 1          | 6           | 1           | 11        | 0          | 2           | 5           | 7       | 0  | 1  | 10 |
| No.10       | 1         | 0          | 9           | 8           | 14        | 0          | 3           | 1           | 16        | 0          | 1           | 1           | 15          | 0          | 1           | 2           | 14         | 0          | 2           | 2           | 12        | 0          | 1           | 5           | 17      | 0  | 1  | 0  |
| No.11       | 0         | 2          | 11          | 5           | 6         | 6          | 5           | 1           | 15        | 2          | 1           | 0           | 5           | 1          | 8           | 4           | 7          | 5          | 5           | 1           | 9         | 0          | 4           | 5           | 7       | 8  | 1  | 2  |
| No.12       | 5         | 0          | 7           | 6           | 6         | 0          | 11          | 1           | 7         | 0          | 8           | 3           | 9           | 1          | 7           | 1           | 14         | 1          | 3           | 0           | 12        | 2          | 4           | 0           | 1       | 0  | 9  | 8  |
| No.13       | 2         | 1          | 2           | 13          | 14        | 0          | 1           | 3           | 9         | 0          | 1           | 8           | 9           | 3          | 4           | 2           | 6          | 3          | 8           | 1           | 8         | 0          | 3           | 7           | 16      | 0  | 2  | 0  |
| No.14       | 8         | 0          | 0           | 10          | 13        | 0          | 3           | 2           | 17        | 0          | 1           | 0           | 16          | 1          | 0           | 1           | 12         | 0          | 1           | 5           | 12        | 0          | 0           | 6           | 12      | 0  | 5  | 1  |
| No.15       | 0         | 0          | 10          | 8           | 0         | 0          | 13          | 5           | 0         | 3          | 12          | 3           | 3           | 2          | 13          | 0           | 0          | 0          | 4           | 14          | 0         | 0          | 4           | 14          | 1       | 3  | 10 | 4  |
| No.16       | 0         | 2          | 7           | 9           | 0         | 1          | 7           | 10          | 0         | 5          | 11          | 2           | 0           | 1          | 15          | 2           | 0          | 8          | 7           | 3           | 0         | 3          | 15          | 0           | 0       | 0  | 6  | 12 |
| No.17       | 3         | 1          | 5           | 9           | 7         | 2          | 3           | 6           | 11        | 1          | 3           | 3           | 8           | 1          | 4           | 5           | 4          | 3          | 7           | 4           | 6         | 0          | 5           | 7           | 6       | 2  | 5  | 5  |
| No.18       | 0         | 0          | 8           | 10          | 0         | 0          | 14          | 4           | 0         | 0          | 16          | 2           | 0           | 0          | 11          | 7           | 0          | 0          | 8           | 10          | 0         | 0          | 12          | 6           | 0       | 2  | 9  | 7  |
| No.19       | 0         | 1          | 8           | 9           | 0         | 1          | 9           | 8           | 0         | 2          | 5           | 11          | 0           | 4          | 8           | 6           | 0          | 3          | 6           | 9           | 0         | 1          | 14          | 3           | 2       | 6  | 7  | 3  |



Table 4-10: Summarization of influence level of each variable.

| Participant             | Strategy | Structure | Size | Environment | Technology | Task | Culture |
|-------------------------|----------|-----------|------|-------------|------------|------|---------|
| No.1                    | 3.1      | 2.9       | 2.7  | 3.1         | 3.3        | 2.4  | 2.3     |
| No.2                    | 2.2      | 2.0       | 2.9  | 1.6         | 2.0        | 1.9  | 2.6     |
| No.3                    | 3.4      | 2.7       | 1.9  | 2.6         | 2.3        | 2.1  | 2.7     |
| No.4                    | 3.6      | 1.0       | 1.0  | 1.7         | 1.0        | 1.2  | 1.4     |
| No.5                    | 1.9      | 1.9       | 1.8  | 2.3         | 1.7        | 1.3  | 2.9     |
| No.6                    | 2.3      | 1.6       | 2.2  | 1.7         | 1.5        | 1.9  | 2.7     |
| No.7                    | 2.2      | 1.3       | 1.5  | 1.9         | 1.7        | 1.9  | 1.8     |
| No.8                    | 3.5      | 1.6       | 1.2  | 3.2         | 1.8        | 2.2  | 1.7     |
| No.9                    | 4.0      | 2.4       | 1.4  | 1.6         | 1.9        | 2.1  | 2.8     |
| No.10                   | 3.3      | 1.5       | 1.3  | 1.4         | 1.6        | 1.9  | 1.1     |
| No.11                   | 3.2      | 2.1       | 1.2  | 2.6         | 2.0        | 2.3  | 1.9     |
| No.12                   | 2.8      | 2.4       | 2.4  | 2.0         | 1.4        | 1.6  | 3.3     |
| No.13                   | 3.4      | 1.6       | 2.4  | 1.9         | 2.2        | 2.5  | 1.2     |
| No.14                   | 2.7      | 1.7       | 1.1  | 1.2         | 1.9        | 2.0  | 1.7     |
| No.15                   | 3.4      | 3.3       | 3.0  | 2.6         | 3.8        | 3.8  | 2.9     |
| No.16                   | 3.4      | 3.5       | 2.8  | 3.1         | 2.7        | 2.8  | 3.7     |
| No.17                   | 3.1      | 2.4       | 1.9  | 2.3         | 2.6        | 2.7  | 2.5     |
| No.18                   | 3.6      | 3.2       | 3.1  | 3.4         | 3.6        | 3.3  | 3.3     |
| No.19                   | 3.4      | 3.4       | 3.5  | 3.1         | 3.3        | 3.1  | 2.6     |
| Mean                    | 3.1      | 2.2       | 2.1  | 2.3         | 2.2        | 2.3  | 2.4     |
| Median                  | 3.3      | 2.1       | 1.9  | 2.3         | 2.0        | 2.1  | 2.6     |
| SD.                     | 0.6      | 0.8       | 0.8  | 0.7         | 0.8        | 0.7  | 0.7     |
| Percentiles 25          | 2.70     | 1.60      | 1.30 | 1.70        | 1.70       | 1.90 | 1.70    |
| Percentiles 50          | 3.30     | 2.10      | 1.90 | 2.30        | 2.00       | 2.10 | 2.60    |
| Percentiles 75          | 3.40     | 2.90      | 2.80 | 3.10        | 2.70       | 2.70 | 2.90    |
| IR. (Percentiles 75-25) | 0.70     | 1.30      | 1.50 | 1.40        | 1.00       | 0.80 | 1.20    |

In literature review, there is no common criteria of consensus for interquartile range value. Some study defined consensus when interquartile range value was below 2.5 (Kittell-Limerick, 2005). Some study claimed that consensus is reached when interquartile range value was below 2 (Scheibe et al., 2002). However, Linstone and Turoff (1975) suggested that a smaller interquartile range value demonstrate the larger consensus. In order to increase validity of consensus determination, Giannarou and Zervas (2014) suggested to use combination measurement to judge for unanimity and in his study also investigated IR. and SD. value to examine the consensus. These two combination measurement could identify an appropriate statistical measure for reporting a consensus value. Respectively, this

study accepted these two measurements combinatory to access consensus as shown below:

- 1) The interquartile range (IR) is below 2 (Scheibe et al., 2002) and
- 2) The standard deviation (SD.) is below 1.5 (Christie & Barela, 2005)

Table 4-10 presented the IR and SD. value of each variable. It indicated that all interquartile range values were below 2 and standard deviation of all cases were below 1.5. It was apparent that this round's result reached the consensus among the participants. In Delphi study, the iterative survey procedure can stop to summarize the result when a certain projection of consensus is achieved (Linstone & Turoff, 1975).

Previously, the finding of influence level of each contingency variable to IT governance process selection was expressed in term of frequency by participant as shown in Table 4-9. In order to summarize for ease of understanding, the result was rearranged to categorized by process and calculated percentage by Microsoft Excel as shown in Table 4-11. It presented agreement percentage of all participant for each variable by each IT governance process. Moreover, to enhance reporting, a stacked bar chart in Figure 4-2 was provided to facilitate clarity of the finding. The chart presented the segment of each level compared by each variable.

Table 4-11: Percentage of each contingency variable influence classified by IT governance process.

| No | IT Governance Process                               | Strategy |     |      | Structure |     |      | Size |     |      | Environment |     |      | Technology |     |      | Task |     |      | Culture |     |      |     |     |     |     |     |     |
|----|---|----------|-----|------|-----------|-----|------|------|-----|------|-------------|-----|------|------------|-----|------|------|-----|------|---------|-----|------|-----|-----|-----|-----|-----|-----|
|    |   | No       | Low | High | No        | Low | High | No   | Low | High | No          | Low | High | No         | Low | High | No   | Low | High | No      | Low | High |     |     |     |     |     |     |
| 1  | Ensure Governance Framework Setting and Maintenance | 0%       | 5%  | 21%  | 74%       | 26% | 32%  | 37%  | 16% | 21%  | 26%         | 37% | 5%   | 32%        | 26% | 42%  | 21%  | 16% | 21%  | 32%     | 16% | 26%  | 32% | 16% | 16% | 37% |     |     |
| 2  | Ensure Benefits Delivery                            | 21%      | 0%  | 42%  | 37%       | 0%  | 42%  | 11%  | 47% | 11%  | 21%         | 47% | 11%  | 21%        | 21% | 47%  | 21%  | 21% | 11%  | 42%     | 5%  | 26%  | 47% | 0%  | 16% | 37% |     |     |
| 3  | Ensure Risk Optimisation                            | 11%      | 5%  | 42%  | 42%       | 11% | 32%  | 21%  | 37% | 11%  | 26%         | 37% | 0%   | 26%        | 37% | 58%  | 0%   | 21% | 21%  | 32%     | 11% | 32%  | 26% | 11% | 26% | 32% |     |     |
| 4  | Ensure Resource Optimisation                        | 32%      | 0%  | 16%  | 53%       | 11% | 37%  | 42%  | 11% | 11%  | 37%         | 53% | 11%  | 37%        | 0%  | 42%  | 16%  | 21% | 21%  | 32%     | 5%  | 37%  | 26% | 16% | 21% | 26% |     |     |
| 5  | Ensure Stakeholder Transparency                     | 26%      | 11% | 21%  | 42%       | 5%  | 37%  | 21%  | 55% | 21%  | 16%         | 11% | 26%  | 32%        | 11% | 74%  | 0%   | 21% | 5%   | 74%     | 5%  | 16%  | 5%  | 32% | 16% | 26% |     |     |
| 6  | Manage the IT Management Framework                  | 5%       | 0%  | 42%  | 53%       | 42% | 11%  | 21%  | 63% | 11%  | 5%          | 21% | 26%  | 5%         | 26% | 42%  | 16%  | 32% | 11%  | 53%     | 11% | 21%  | 16% | 16% | 16% | 26% |     |     |
| 7  | Manage Strategy                                     | 0%       | 0%  | 11%  | 89%       | 37% | 0%   | 53%  | 11% | 58%  | 5%          | 32% | 5%   | 42%        | 11% | 42%  | 11%  | 42% | 5%   | 47%     | 11% | 16%  | 26% | 37% | 11% | 32% | 21% |     |
| 8  | Manage Enterprise Architecture                      | 5%       | 5%  | 16%  | 74%       | 26% | 16%  | 32%  | 32% | 16%  | 26%         | 47% | 11%  | 32%        | 11% | 26%  | 16%  | 21% | 37%  | 55%     | 11% | 32%  | 5%  | 47% | 16% | 32% | 5%  |     |
| 9  | Manage Innovation                                   | 11%      | 0%  | 32%  | 58%       | 11% | 16%  | 63%  | 16% | 21%  | 0%          | 21% | 32%  | 37%        | 11% | 21%  | 0%   | 58% | 21%  | 63%     | 21% | 11%  | 5%  | 32% | 26% | 16% | 26% |     |
| 10 | Manage Portfolio                                    | 26%      | 16% | 26%  | 32%       | 47% | 11%  | 37%  | 5%  | 37%  | 5%          | 37% | 5%   | 26%        | 5%  | 42%  | 5%   | 37% | 16%  | 37%     | 5%  | 32%  | 26% | 47% | 26% | 21% | 5%  |     |
| 11 | Manage Budget and Costs                             | 11%      | 5%  | 26%  | 58%       | 37% | 5%   | 53%  | 5%  | 58%  | 5%          | 37% | 0%   | 42%        | 11% | 42%  | 5%   | 47% | 11%  | 32%     | 58% | 5%   | 16% | 21% | 47% | 21% | 11% |     |
| 12 | Manage Human Resources                              | 32%      | 5%  | 37%  | 26%       | 21% | 11%  | 26%  | 42% | 37%  | 5%          | 37% | 5%   | 58%        | 0%  | 37%  | 5%   | 63% | 16%  | 5%      | 58% | 5%   | 21% | 16% | 21% | 16% | 32% |     |
| 13 | Manage Relationships                                | 37%      | 32% | 21%  | 11%       | 26% | 21%  | 32%  | 21% | 55%  | 21%         | 11% | 16%  | 68%        | 16% | 5%   | 11%  | 63% | 21%  | 5%      | 32% | 5%   | 32% | 5%  | 16% | 26% | 55% |     |
| 14 | Manage Service Agreements                           | 21%      | 5%  | 26%  | 47%       | 53% | 5%   | 21%  | 21% | 58%  | 11%         | 16% | 16%  | 42%        | 11% | 32%  | 16%  | 53% | 0%   | 21%     | 26% | 21%  | 5%  | 16% | 58% | 32% | 32% |     |
| 15 | Manage Suppliers                                    | 26%      | 16% | 11%  | 47%       | 74% | 0%   | 26%  | 0%  | 37%  | 21%         | 21% | 47%  | 11%        | 26% | 16%  | 26%  | 16% | 42%  | 37%     | 5%  | 32%  | 26% | 53% | 16% | 32% | 0%  |     |
| 16 | Manage Quality                                      | 21%      | 11% | 32%  | 37%       | 47% | 5%   | 37%  | 11% | 68%  | 11%         | 21% | 0%   | 53%        | 16% | 5%   | 26%  | 47% | 16%  | 16%     | 21% | 37%  | 5%  | 37% | 21% | 42% | 16% |     |
| 17 | Manage Risk   | 21%      | 0%  | 26%  | 53%       | 11% | 11%  | 26%  | 47% | 16%  | 11%         | 26% | 0%   | 63%        | 16% | 63%  | 42%  | 5%  | 32%  | 21%     | 37% | 11%  | 37% | 16% | 42% | 32% | 16% |     |
| 18 | Manage Security                                     | 21%      | 0%  | 16%  | 63%       | 58% | 5%   | 16%  | 21% | 37%  | 11%         | 21% | 5%   | 53%        | 11% | 37%  | 5%   | 53% | 5%   | 32%     | 32% | 5%   | 32% | 11% | 42% | 21% | 26% | 11% |

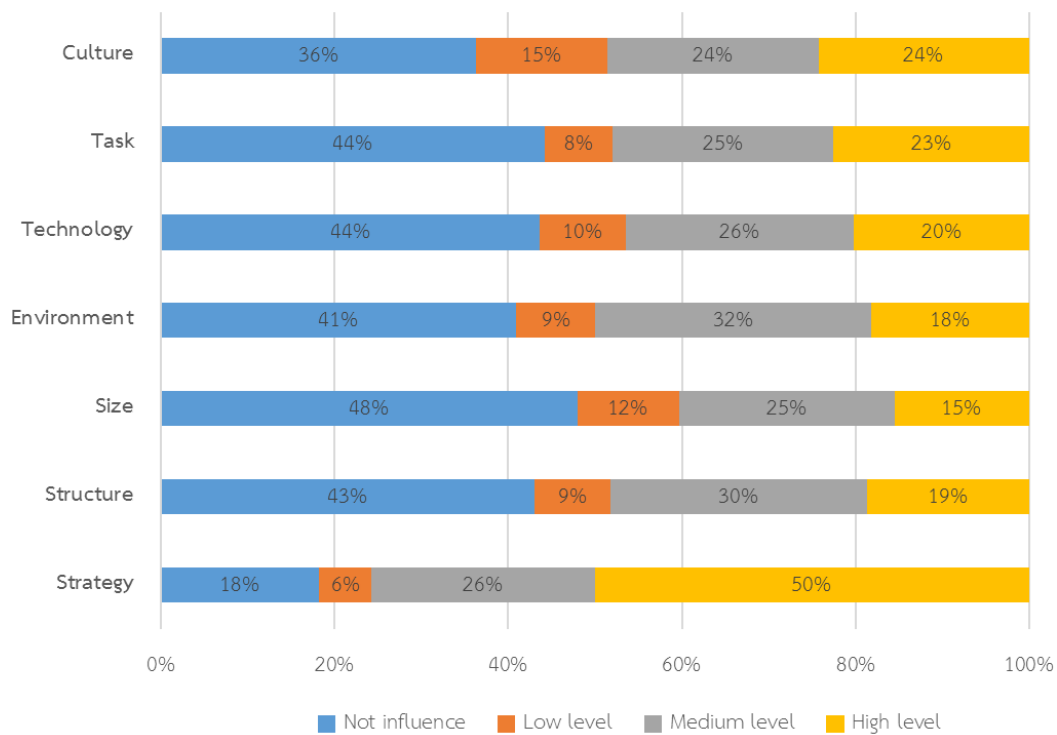


Figure 4-2: Chart of summarize influence level of each contingency variable

Based on the finding, most contingency variables effected to IT governance process selection in similar level. Interestingly, there was one outstanding variable that is Strategy. Organizational strategy was treated as critical variable that explicit highly percentage (50%) in high influence level to IT governance process selection. The second-high influence level (24%) was Culture variable. On the contrary, the lowest-high influence level (15%) was Size variable including the highest in not influence level (48%). It implied that company size had not much related to IT governance process selection. However, this finding would be verified by another group of expert in successive phase in order to increase validity of this result.

#### 4.4 Phase 4: Formulating and Validating the Guideline

This last phase aimed to develop a guideline from collectively result in first-three phases that obtained and gathered insight, idea, opinion from nineteen participants about IT governance implementation, importance and business-IT alignment including their judgement about contingency variable influence to IT

governance process selection. All data was collected to achieve this phase's objective that targeted to answer the second research question which is:

*Q2: How can contingency factors be adopted to derive an IT governance processes selection guideline that concerns business-IT strategy alignment?*

Not only developing a guideline but this phase also requested the other group of expert to validate the guideline. Therefore, main procedure in this phase was divided in two parts which were formulating and validating.

#### 4.4.1 Formulating Guideline

This step started by synthesis data from all previous phases to formulate a guideline for IT governance process selection. Some studies in Delphi technique used theme analysis (Udo-Akang, 2013) or cluster analysis (Tapio, 2003) to forecast and conclude of the finding. Theme analysis uses to find a patterns across data sets to explain of a phenomenon. Cluster analysis or Clustering is one of statistical technique that uses to identify groups of object with similar characteristic into the same group and different from set to other group. These two approaches were considered to conduct a guideline for this study.

The researcher assembled the consensus data from the last survey round which represented the influence level of contingency variables to each IT governance process. Moreover, result from interview session about perception of IT governance process that indicated important level and supporting level of business-IT alignment was useful for building a guideline. The use of IBM SPSS Statistics version 23 was a best appropriate for cluster analysis. It enabled to capture a consolidate group of IT governance process through perception and contingency variable influence level. This data was in the same type variable with the same level of measurement including high, medium and low. Thus, all data was imported to SPSS program and it was analyzed to construct the cluster. The number of case become eighteen based on number of IT governance process.

Hierarchical clustering is a common method that uses to quantify distance between cases and generates a series of models with number of cluster from 1 (all

cases in one cluster) to n (all cases are an individual cluster). This study employed this method to structure similar group of IT governance processes. The researcher determined to separate the group from 2 to 9 clusters based on half of total number of IT governance process. The clusters were categorized into three scenarios based on level of measurement including high, medium and low. High level of seven contingency influence level, high level of important for organization and high level of support to achieve business-IT alignment was computed into eight cluster (2-9 clusters) represented in Table 4-12. The other two scenarios which are medium and low level presented in Table 4-13 and Table 4-14.

Table 4-12: Scenario 1-High level of seven contingency variables Influencing & Importance & Business-IT Alignment

| No | IT Governance Processes                             | Number of Cluster |   |   |   |   |   |   |   |
|----|---|-------------------|---|---|---|---|---|---|---|
|    |   | 2                 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1  | Ensure Governance Framework Setting and Maintenance | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2  | Ensure Benefits Delivery                            | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3  | Ensure Risk Optimisation                            | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 4  | Ensure Resource Optimisation                        | 2                 | 2 | 2 | 2 | 2 | 3 | 3 | 3 |
| 5  | Ensure Stakeholder Transparency                     | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 6  | Manage the IT Management Framework                  | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7  | Manage Strategy                                     | 1                 | 1 | 1 | 1 | 3 | 4 | 4 | 4 |
| 8  | Manage Enterprise Architecture                      | 2                 | 2 | 2 | 2 | 2 | 3 | 3 | 5 |
| 9  | Manage Innovation                                   | 2                 | 2 | 2 | 3 | 4 | 5 | 5 | 6 |
| 10 | Manage Portfolio                                    | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 11 | Manage Budget and Costs                             | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 12 | Manage Human Resources                              | 1                 | 3 | 3 | 4 | 5 | 6 | 6 | 7 |
| 13 | Manage Relationships                                | 1                 | 3 | 3 | 4 | 5 | 6 | 6 | 7 |
| 14 | Manage Service Agreements                           | 1                 | 1 | 1 | 1 | 1 | 1 | 7 | 8 |
| 15 | Manage Suppliers                                    | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 16 | Manage Quality                                      | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 17 | Manage Risk   | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 18 | Manage Security                                     | 2                 | 2 | 4 | 5 | 6 | 7 | 8 | 9 |

Table 4-13: Scenario 2-Medium level of seven contingency variables Influencing & Importance & Business-IT Alignment

| No | IT Governance Processes                             | Number of Cluster |   |   |   |   |   |   |   |
|----|---|-------------------|---|---|---|---|---|---|---|
|    |   | 2                 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1  | Ensure Governance Framework Setting and Maintenance | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2  | Ensure Benefits Delivery                            | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3  | Ensure Risk Optimisation                            | 1                 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 4  | Ensure Resource Optimisation                        | 1                 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| 5  | Ensure Stakeholder Transparency                     | 1                 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 6  | Manage the IT Management Framework                  | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7  | Manage Strategy                                     | 1                 | 1 | 3 | 4 | 4 | 4 | 4 | 4 |
| 8  | Manage Enterprise Architecture                      | 1                 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 9  | Manage Innovation                                   | 2                 | 3 | 4 | 5 | 5 | 5 | 5 | 5 |
| 10 | Manage Portfolio                                    | 1                 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 11 | Manage Budget and Costs                             | 1                 | 1 | 3 | 4 | 4 | 4 | 4 | 6 |
| 12 | Manage Human Resources                              | 1                 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 13 | Manage Relationships                                | 1                 | 1 | 1 | 2 | 2 | 6 | 6 | 7 |
| 14 | Manage Service Agreements                           | 1                 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 15 | Manage Suppliers                                    | 1                 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 16 | Manage Quality                                      | 1                 | 1 | 1 | 2 | 2 | 6 | 6 | 7 |
| 17 | Manage Risk   | 1                 | 2 | 2 | 3 | 3 | 3 | 7 | 8 |
| 18 | Manage Security                                     | 1                 | 2 | 2 | 3 | 6 | 7 | 8 | 9 |

Table 4-14: Scenario 3-Low level of seven contingency variables Influencing & Importance & Business-IT Alignment

| No | IT Governance Processes                             | Number of Cluster |   |   |   |   |   |   |   |
|----|---|-------------------|---|---|---|---|---|---|---|
|    |   | 2                 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1  | Ensure Governance Framework Setting and Maintenance | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2  | Ensure Benefits Delivery                            | 1                 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| 3  | Ensure Risk Optimisation                            | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4  | Ensure Resource Optimisation                        | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5  | Ensure Stakeholder Transparency                     | 1                 | 1 | 2 | 2 | 2 | 2 | 3 | 3 |
| 6  | Manage the IT Management Framework                  | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7  | Manage Strategy                                     | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 8  | Manage Enterprise Architecture                      | 1                 | 1 | 1 | 1 | 3 | 3 | 4 | 4 |
| 9  | Manage Innovation                                   | 2                 | 2 | 3 | 3 | 4 | 4 | 5 | 5 |
| 10 | Manage Portfolio                                    | 1                 | 1 | 1 | 4 | 5 | 5 | 6 | 6 |
| 11 | Manage Budget and Costs                             | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | Manage Human Resources                              | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 13 | Manage Relationships                                | 1                 | 3 | 4 | 5 | 6 | 6 | 7 | 7 |
| 14 | Manage Service Agreements                           | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 15 | Manage Suppliers                                    | 1                 | 1 | 1 | 1 | 1 | 1 | 2 | 8 |
| 16 | Manage Quality                                      | 1                 | 1 | 1 | 1 | 1 | 1 | 2 | 8 |
| 17 | Manage Risk   | 1                 | 1 | 1 | 4 | 5 | 7 | 8 | 9 |
| 18 | Manage Security                                     | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Three scenarios table showed the cases (IT governance process) in each cluster for any number of clusters. In each cluster was characterized by group numbers that were highlighted in its column. The way to interpret the clustering table is:

Step 1: Select scenario

Step 2: Select number of cluster

For example, select to interpret scenario 1 (Table 4-12) and focus on number two of cluster. Scenario 1 was high level of all variable and column underlay number of cluster was number 2. The finding was separated into two groups which classified by different color as displayed in Figure 4-3.



| No | IT Governance Processes                             | Number of Cluster |   |   |   |   |   |   |   |
|----|---|-------------------|---|---|---|---|---|---|---|
|    |   | 2                 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1  | Ensure Governance Framework Setting and Maintenance | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2  | Ensure Benefits Delivery                            | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3  | Ensure Risk Optimisation                            | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 4  | Ensure Resource Optimisation                        | 2                 | 2 | 2 | 2 | 2 | 3 | 3 | 3 |
| 5  | Ensure Stakeholder Transparency                     | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 6  | Manage the IT Management Framework                  | 1                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7  | Manage Strategy                                     | 1                 | 1 | 1 | 1 | 3 | 4 | 4 | 4 |
| 8  | Manage Enterprise Architecture                      | 2                 | 2 | 2 | 2 | 2 | 3 | 3 | 5 |
| 9  | Manage Innovation                                   | 2                 | 2 | 2 | 3 | 4 | 5 | 5 | 6 |
| 10 | Manage Portfolio                                    | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 11 | Manage Budget and Costs                             | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 12 | Manage Human Resources                              | 1                 | 3 | 3 | 4 | 5 | 6 | 6 | 7 |
| 13 | Manage Relationships                                | 1                 | 3 | 3 | 4 | 5 | 6 | 6 | 7 |
| 14 | Manage Service Agreements                           | 1                 | 1 | 1 | 1 | 1 | 1 | 7 | 8 |
| 15 | Manage Suppliers                                    | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 16 | Manage Quality                                      | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 17 | Manage Risk   | 2                 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 18 | Manage Security                                     | 2                 | 2 | 4 | 5 | 6 | 7 | 8 | 9 |

Figure 4-3: Example of clustering table interpretation

Two groups identified the different set of process as:

Group 1: Process No.1,2,6,7,12,13,14

Group 2: Process No.3,4,5,8,9,10,11,15,16,17,18

Number 1 and 2 in the column represented only the number of group and it did not refer to any priority or important of data. The cases were collected in the same number of group because of their homogeneous characteristic. In Group 1, seven IT governance processes (No.1,2,6,7,12,13,14) were joined in this same group that indicated the similarity of these seven processes with regard to high level of contingency variable influence, high level of important for organization and high level to support business-IT alignment. Group 2 contained of eleven processes that mean these all processes had a similar characteristic. Additional, number of group such as Group 1 and Group 2 also reflected that these two group had different characteristic between group. As mention earlier that implement all IT governance processes at once is difficult. This interpretation could suggest the way to recognize the group of IT

governance process. For example, the practitioner who would like to select IT governance processes by concerning of these conditions (high level and 2 clusters), they could select to implement such a group of process from group 1 (seven processes) or group 2 (eleven processes) as suggest in clustering guideline.

The segmentation of IT governance process from clustering guideline could help the practitioners to consider the relevance of the chosen set of IT governance process. However, clustering guideline in scenario 3 with regard to low level of contingency variable influence, low level of important for organization and low level to support business-IT alignment indicated that nine IT governance process did not change and it adhered in the same group (group 1) through all number of cluster (2-9). It revealed that in the condition of low level in all variable, the characteristic between group was difficult to calculate the differences between group.

Furthermore, the researcher would like to explore similar pattern in clustering guideline. According to indistinctly cluster of scenario3, the researcher decided to compare and seek for similar pattern only from two scenarios (High level and medium level). Table 4-15 shown comparison and similar pattern finding.

Table 4-15: Comparison of Scenario 1(High Level) and Scenario 2 (Medium Level)

| No | IT Governance Processes                             | Scenario: High Level |   |   |   |   | Scenario: Medium Level |   |   |   |   |
|----|---|----------------------|---|---|---|---|------------------------|---|---|---|---|
|    |   | Number of Cluster    |   |   |   |   | Number of Cluster      |   |   |   |   |
|    |   | 2                    | 3 | 4 | 5 | 6 | 2                      | 3 | 4 | 5 | 6 |
| 1  | Ensure Governance Framework Setting and Maintenance | 1                    | 1 | 1 | 1 | 1 | 1                      | 1 | 1 | 1 | 1 |
| 2  | Ensure Benefits Delivery                            | 1                    | 1 | 1 | 1 | 1 | 1                      | 1 | 1 | 1 | 1 |
| 3  | Ensure Risk Optimisation                            | 2                    | 2 | 2 | 2 | 2 | 1                      | 1 | 1 | 2 | 2 |
| 4  | Ensure Resource Optimisation                        | 2                    | 2 | 2 | 2 | 2 | 1                      | 2 | 2 | 3 | 3 |
| 5  | Ensure Stakeholder Transparency                     | 2                    | 2 | 2 | 2 | 2 | 1                      | 1 | 1 | 2 | 2 |
| 6  | Manage the IT Management Framework                  | 1                    | 1 | 1 | 1 | 1 | 1                      | 1 | 1 | 1 | 1 |
| 7  | Manage Strategy                                     | 1                    | 1 | 1 | 1 | 3 | 1                      | 1 | 3 | 4 | 4 |
| 8  | Manage Enterprise Architecture                      | 2                    | 2 | 2 | 2 | 2 | 1                      | 1 | 1 | 2 | 2 |
| 9  | Manage Innovation                                   | 2                    | 2 | 2 | 3 | 4 | 2                      | 3 | 4 | 5 | 5 |
| 10 | Manage Portfolio                                    | 2                    | 2 | 2 | 2 | 2 | 1                      | 1 | 1 | 2 | 2 |
| 11 | Manage Budget and Costs                             | 2                    | 2 | 2 | 2 | 2 | 1                      | 1 | 3 | 4 | 4 |
| 12 | Manage Human Resources                              | 1                    | 3 | 3 | 4 | 5 | 1                      | 1 | 1 | 2 | 2 |
| 13 | Manage Relationships                                | 1                    | 3 | 3 | 4 | 5 | 1                      | 1 | 1 | 2 | 2 |
| 14 | Manage Service Agreements                           | 1                    | 1 | 1 | 1 | 1 | 1                      | 1 | 1 | 2 | 2 |
| 15 | Manage Suppliers                                    | 2                    | 2 | 2 | 2 | 2 | 1                      | 1 | 1 | 2 | 2 |
| 16 | Manage Quality                                      | 2                    | 2 | 2 | 2 | 2 | 1                      | 1 | 1 | 2 | 2 |
| 17 | Manage Risk   | 2                    | 2 | 2 | 2 | 2 | 1                      | 2 | 2 | 3 | 3 |
| 18 | Manage Security                                     | 2                    | 2 | 4 | 5 | 6 | 1                      | 2 | 2 | 3 | 6 |

| Similar Pattern (2-6 Clusters) | High Level             | Medium Level            | High & Medium Level |
|--------------------------------|------------------------|-------------------------|---------------------|
| Set 1                          | 1,2,6,14               | 1,2,6                   | 1,2,6               |
| Set 2                          | 3,4,5,8,10,11,15,16,17 | 3,5,8,10,12,13,14,15,16 | 3,5,8,10,15,16      |
| Set 3                          | 12,13                  | 4,17                    | -                   |

In study of Tapio (2003) suggested that the appropriate number of cluster to study scenario set is suitable at five clusters. To find the similar pattern from two scenarios, the researcher also scoped down number of cluster from eight clusters to five clusters to collate a relatively homogeneous groups of scenarios.

Table 4-15 expressed the comparing of two scenarios clustering guideline. The code number of group and color enabled the researcher to structure same data pattern. It appeared that two sets of IT governance process represent in both scenarios from cluster number 2 to 6. The first set contained with three IT governance processes (No. 1, 2, 6). The other set contained with six IT governance processes (No.3,5,8,10,15,16). These two sets with having similar pattern from both cluster scenarios could explicit the main group of IT governance processes. Although these clustering guideline and similar pattern provided a suggestion in IT governance process selection. It still required another group of expert to verify this guideline. The researcher used information from this finding to conduct the validation procedure as addressed in the section that follows.

#### 4.4.2 Validating Guideline

Three validators from different organizations were invited to validate the finding and guideline. Face-to-Face interview with individual validator was held to gather rich and deep opinion. Brief introduction of researcher profile, research objective and methodology was explained before presented the finding from nineteen participants and guideline. They were requested to express their opinion and give a suggestion about this research outcome.

The first validator is one of executive member in ISACA (Information Systems Audit and Control) Thailand Chapter and also a director in top-five worldwide auditing firm. She shared her experience about IT governance process adoption that many companies start to look at the problem or pain point before select such a process to implement. Some organizations started by implement the easiest process with has a big impact to organization. However, it is very hard to quick win in select what process is easiest but most effective. IT governance project need at least six months and many companies faced with unsuccessful project. Governance project required a ton of document and need many businesses units' cooperation. One main reason of failure in IT governance project is unclear direction from top management. Consequently, she highly agreed with the finding that strategy variable was the most influence variable for IT governance process selection. Not only strategy but also

regulatory environment and culture was importance as some quote from interview session shown below:

*“I really buy in with this finding that strategy is the most powerful. Between top down and bottom up strategy, I can say that IT governance implementation cannot happen from bottom up. Only strong support from Top-down can make it happened. Not only supporting but also announcement and setting clearly policy to IT governance project is very serious. In my view, the other variable is environment. External environment always forces many regulations for example bank industry. Bank has to comply with it without any exception. One more thing, culture is also importance. Is there anyone in organization is willing to involve in IT governance project? If no one engages in project, it would not happen and finally it fails. Implement these IT governance processes required many hands from many BUs, for example, risk department, HR. They have to involve in project. In my view, governance project need a specific team to coordinate and take accountable. Just only IT dedicated person, it is not enough.” (Validator No.1)*

Base on her experience, strategy from top management, regulatory environment and culture had to consider before initial a governance project. She was interested in clustering IT governance process guideline and agreed that the similar pattern group finding, for example; process No.1 (Ensure governance framework setting and maintenance), No.2 (Ensure benefit delivery) and No.6 (Manage the IT management framework), were main core process. However, she recommended that IT governance process based on COBIT is related process. Each process is coherent that one process can be input for other process. In COBIT also provided implementation guideline but it was different side with this research finding. It is quite complicate to study all COBIT materials. From her idea, this research outcome can be a starter guideline because of ease to understand. There are some quotes from interview that support her view points.

“In COBIT implementation guide provided a basis assessment to select IT governance process but it is different aspect from your guideline. I have not thought that someone will look these process from this aspect. This one is a good starter guideline to help practitioner to consider about IT governance process. In my view, it is easy to understand a group of COBIT process. It quite hard to understand COBIT framework even in implementation guide tell what to do but not tell clearly how to do or how select it.” (Validator No.1)

Aside from concerning of how to select IT governance process, she also suggested that implement IT governance process is endless process and iterative steps as a life cycle. She recommended to recognize seven phases of the implementation life cycle in COBIT. Each step provides useful information about sustain governance as shown in Figure 4-4. (ISACA, 2012c).

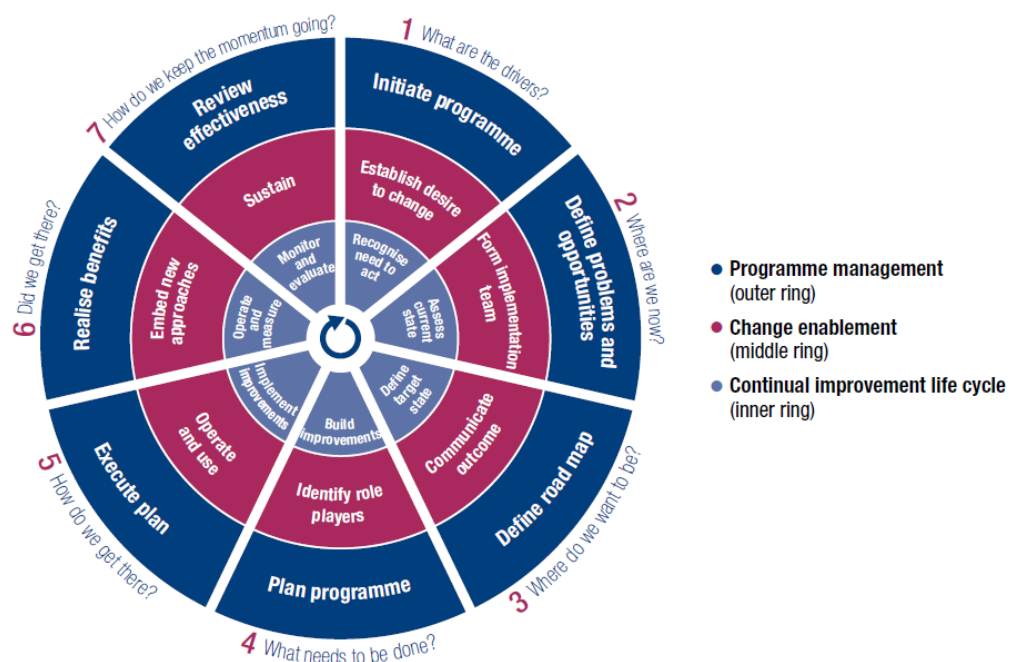


Figure 4-4: The Seven Phases of the Implementation Life Cycle

In overall, she concluded that implement IT governance is beneficial for organizations. To select an appropriate IT governance process to align business with IT is also very importance. ISACA developed COBIT5 that offers many materials to

encourage wide use and global adoption of IT governance. It is not easy to implement all fully process. Even in COBIT provided implementation guideline but it is limited at a high-level introduction for adoption and selection. This research's finding and clustering guideline opened another aspect that can help everyone in IT who is interested in IT governance process to understand and apply on their selection approach. In addition, IT governance process adoption has to retain by continual improvement as life cycle.

The second validator is a Managing Director of IT consulting company that focuses on IT governance and IT service area. He is a lecture and trainer about IT governance frameworks for many organizations and universities. Not only educate but also give an advice for many companies to implement IT governance and IT service improvement project. Based on his experience, he agreed that strategy is the most influence variable and culture is another main variable for IT governance project. Size and structure are not much related to IT governance process selection. There is some quote below from interview session to support the conclusion.

*“Strategy is the most one. If top executive realizes IT as a tool for run their business. They will not think about IT governance. In my view, size and structure are not much related to IT governance process selection. How big or small company is not big deal. I think small company is easier to implement these IT processes. Implementing do not need more money, tool but it is really, really need is policy that is defined from strategy... “Culture variable is also highly related. I saw many conservative companies. They do not even realize what is IT governance. They are not interested such a framework. IT is not just a tool but IT is a part of business. Which organization see IT as a part of their business, IT governance will happen.” (Validator No. 2)*

The second validators discussed that COBIT suggests IT process without in-depth explanation on how to used or real implement it. The researcher presented the clustering guideline and he gave a feedback as quote bellowed.

*“I am okay. Clustering guideline is useful. Actually, when I teach to my client and student, I always said all processes are important. In fact, there are all important but in different level. My worry is many people do not understand well about relationship of these process. I agreed with the finding of core process from these scenarios. Process No.1 and No.6, it always come together. No.1 generated by board and committee to set policy, structure, principle but not action yet. No.6 is real operation follow by policy from process No.1. Actually process No.2 always adhere with process No.1. However, many people do not know how to implement Process No.2. How to get a benefit from IT investment? What is the benefit from IT? To do process No.2, they must have their portfolio, strategy, and service agreement process. My point is many people do not understand how to implement these processes or COBIT. That is why company has to use external consultant to suggest which process should be implemented.” (Validator No. 2)*

The second validator supported clustering guideline and the similar pattern that disclosed the core processes, which same with his opinion and experience. He revealed that in Thailand many executives did not pay attention much about the important of IT governance framework. Resulting in not many companies required to adopt IT governance framework. He also suggested that governance is not just a policy. The key success of IT governance project is strongly supporting from executive and changing IT image. IT is not just a technician but today IT become a business partner. IT itself has to transform to reactive service that can change new look of IT. That was supported his feedback that strategy and culture are the main variables that impact to IT governance project.

The last validator is a Senior Head of leading bank of Thailand. He had a high experience in implement and improving IT process particular for banking service. He shared that his organization has three main steps to implement IT governance project, which are plan, build, and operate. Plan is the first step to define and setting policy and strategy. Build is design step to find the best fit solution. Last but not least,



operate is deploy step to release activity for execution. It is a complex to transfer new concept or transform process in his organization because complicated organization structure. Moreover, banking industry has to comply with many standards and regulations from both external and inter audit. From his opinion, strategy, structure and environment are very influence variables for selection of IT governance process. He also discussed about related variable illustrated as quote below.

*“It sounds feasible that strategy is the most important variable. Previously, my bank used IT outsource and our main job was just controlling all vendor to server us the right and the best service. See! now strategy was changed from IT outsource to IT insource. Everything become reverse. Our main job was changed and we have to do better than our vendor did. Before we changed policy from outsource to insource, our executive and broad concerned much in our organization structure and regulatory environment... In my mind, a way to select IT governance process mostly people think about what is their critical problem or serious pain point. Then just pick a process that can solve that problem. I think size does not matter. Big or small company size did not drive to implement IT governance. If company has the problem, it rushes to implement IT governance. You know small company size is easier than big one. Large company has complex structure that is very hard to move or changed”*  
(Validator No.3)

Based on his experience, he stated that IT governance process is very essential for all organizations. Implement of international process as COBIT not only can help to improve better effective IT but also set a common language for communicate with all stakeholder. He conformed with clustering guideline and also suggest that next step should apply maturity level to access organization level to make it more valuable. The quote below demonstrated the validator’s discussion.

*“I accepted this finding and guideline is worthwhile. Select all processes to implement is impossible and hardly to happen. Actually, it could be but it takes time. IT investment is complicate. Sometime we bought*

*something one hundred but we used only ten. Then we have to rethink carefully to compromise IT budget. These processes are rationality together. One process can be a reason to do another process. This guideline showed the group of related process with different scenario. It is easy to understand. However, each organization has different problem scope. It would be great whether in next step or further research you can apply maturity level to develop an assessment for organization.”*  
(Validator No.3)

In conclusion, all three validators agreed together with related variables finding that strategy was the most influence variable for select IT governance process. The other variables such as structure, environment were also related but not high impact as strategy. All validators mentioned that top management or executive is a key person to determine strategy and set a clearly policy to identify role and responsibility to all participation in a governance project. They all accepted that company size is the least influence variable. Sometimes small company might quick and easy for making a decision to adopt IT governance process. On the contrary, small company might not have resource limitation to do governance project. Each organization has different criteria and constrains.

Three validator accorded that adoption of IT governance process from COBIT are advantages of being globally accepted and it is an open standard which is available to be used by any organization. IT governance process can help organization to find and solve the root cause of their problem. However, it was questionable that relatively few companies in Thailand have started to use existing IT governance frameworks to help them. All validators recognized that to cover and fully adoption of all comprehensive process that was too tough to occur. Organizations had to face of a high degree of complexity and it was too risky to success. Two validators (No.1 and No.3) suggested that it can be overcome by an initially selective implementation of some process by concerning of their main pain point and critical problem.

All validators accepted with the clustering guideline for IT governance process selection that is applicable as a starter guideline for implementer and

practitioner. They stated that it is useful and ease for any organizations to consider the clustering guideline from this research's outcome before select such a process because it can be invaluable in helping to avoid the pitfalls and in enhancing their ability to achieve success in the shortest time to IT governance implementation.

#### **4.5 Summary**

This chapter presented the finding from all four phases of data collection and analysis. The objectives of each phase were illustrated with focus to serve all research questions. The data gathering was conducted by one interviewing round and three questionnaire survey rounds with nineteen participants. This chapter also described a way to analyze the result in systematic approach by complying with Delphi technique criteria. The use of IBM SPSS software and Microsoft excel to compute and analyze data was revealed.

The result from the first phase, discovery variable, expressed the perception of IT governance process including implementation, important level for organization and supporting level to achieve business-IT alignment. Moreover, all seven contingency variables were voted as significant related to IT governance process selection. To support the finding, many quotes from interview session was shown and agreement percentage of each perception component also presented.

The second phase aimed to determine the important variable by conduct a survey with electronic questionnaire. This phase found that each contingency variable influence to IT governance process selection in different level. Strategy variable showed as a significant variable. The other variable represents as related variable but not strong as strategy. Moreover, this phase also provided the answer from interview session to inquire a confirmation from all participant.

The third phase was conducted with two survey rounds to gather responses about ranking and influence level from nineteen participants. The first survey round in this phase obtained the ranking variable but the result could not achieve consensus. The revised of questionnaire was manipulated to improve the way to explore the influence level of each contingency variable by each IT governance process. It was an

iterative process that cause the delay in response. Gentle remind email and phone call were used to expedited the respondent. All nineteen participant rated their judgement in four Likert scale about influence level of each variable classified by eighteen IT governance process. In second survey round, the data achieve the consensus. This study also employed combination measurement to clarify the way of reaching consensus among group. The summarize and conclusion of finding express that strategy was a critical variable that had high level of IT governance process selection. Culture is the second one and the weakest influence variable was size of company.

The multiple opinion, experience, ideas from all participants through one interview session and three rounds of survey by questionnaire was synthesized to develop a guideline. Cluster analysis by SPSS program was used to structure clustering guideline. Three scenarios clustering guideline presented a group of IT governance with homogeneous characteristic. Pattern analysis used to find a similar set of IT governance process. Two main set of IT governance process was presented for suggest the practitioner to consider the relevance of the chosen set of IT governance process. The last phase ended with validation finding from three experts. All validators agreed with the finding and overwhelmed with clustering guideline. They accepted that it is valuable and practicable for real business world.

## Chapter 5 Discussion

This dissertation is organized into five chapters. Firstly, introductory chapter presents background, problem statement, research objective, scope and assumption of study. Secondly, extensive literatures were review on related domains with this research including IT governance, IT governance process, Contingency theory and perception theory is described. Thirdly, Delphi technique and procedure to conduct research including data collection and analysis is demonstrated. Fourthly, the finding of each data collection phase was illustrated including synthesize a clustering guideline. In this last chapter, it starts with the summary of this research, discussion of findings, the relations of findings with each research question are presented. The academic and practical contribution are described. Finally, limitations of this research and some opportunities for future research is identified.

### 5.1 Research Summary

Past literatures in IT governance reveal an important, a numerous beneficial, many outcomes and success case studies of IT governance processes implementation. Moreover, there are many international standards, best practices, and frameworks available to support implementation. For this reason, more and more organizations interest to adopt IT governance processes. However, from literature review also disclosed that not many organizations across the world adopted IT governance processes including in Thailand. One reason that many organizations in Thailand had not widely adopted IT governance processes is it is still difficult to select appropriate IT governance processes because each IT governance framework provides plentifully of processes and it is quite impossible to implement all of them. In MIS field, the contingency theory suggested the fit concept between contingency factors and design can influence organizational performance (Weill & Margrethe, 1989). Previous researches in IT governance domain also applied this concept. However, there is still no study that applies these factors in the selection of IT governance processes. This problem motivated the author to study, explore and identify the contingency factors

that are related to IT governance processes selection. This motivation translates into the research objectives and two research questions.

In order to fulfill this research gap and accomplish the research objectives, this study considered the most appropriate method and decided to apply Delphi technique as the main research method. The main characteristic of this technique is a systematic method for gathering the in-depth attitudes and soliciting consensus ideas from a group of experts in specific domain with anonymity (Dalkey & Helmer, 1963).

To answer all research questions, this study employed three main phases from Delphi technique including discovery factors, determining the important factors, and ranking the factors. Furthermore, to ensure the reliability of the results, this study decided to add one more phase which is formulating and validating the guideline phase. All four phases of research procedure were designed by considering all purposes of this study. In the first three phases, researcher conducted interviews and surveys with nineteen participants to find out the insights and opinions and examine agreement on determinants of IT governance processes selection by using contingency theory and perception concept as theoretical foundations. The last phase developed a clustering guideline from the collectively results from prior phases and invited another group of experts to validate the findings and results.

Two groups of experts participated in this research, which are a group of nineteen participants and a group of three validators. All of them were qualified as the experts and willing to join and contribute in this research. The brief of all expert profiles and criteria were identified in Chapter 3. The details of this research findings were presented in Chapter 4. The next section will discuss the interesting relevant data from the findings.

Furthermore, this study also provides a clustering guideline to consolidate group of IT governance processes through perception and contingency factor influence level. Three scenarios guideline presents a group of IT governance processes with regard to the level of relationship between seven contingency factors, importance and business-IT alignment including high, medium and low levels. Additionally, the similar

pattern set of IT governance processes was analyzed to explore the core group of IT processes. The finding revealed two sets of IT governance processes that have similar pattern from both cluster scenarios.

## 5.2 Discussion

### 5.2.1 Discussion on result and additional finding

This study aims to squeeze the opinions from all participants about influence level of each contingency factor to IT governance processes selection. After the first round of interviewing and four survey rounds with nineteen participants, the consensus of findings was attained. The result reveals the perception of IT governance by classifying into three perspectives namely implementation, important and business-IT alignment.

All nineteen participants agreed that IT governance implementation is important to organization and it can help to achieve business-IT alignment. In more detail, each eighteen IT governance processes had a various important and benefit level. Some processes were highly accepted to implement and had high important level for organization but could not get a strong support to achieve business-IT alignment such as “Manage security”. Alternatively, some processes were seldom implemented but they were important to organization and got a strong support to achieve business-IT alignment such as “Manage Enterprise Architecture”. Based on all participants’ experiences, organizations select to implement just some IT governance processes instead of implement all IT governance processes at once because it need much effort, budget, time and resource to implement all processes. They all agreed that it was difficult for organizations to study all IT processes and frameworks and made a decision to select ones. This finding is in the line with the previous study by Winniford et al. (2009), they found a barrier to the adoption of IT governance which is insufficient information about the IT governance framework.

This study believed that contingency factors can be used to explain the selection of IT governance processes. Therefore, all seven contingency factors including strategy, structure, size, environment, technology, task and culture were

addressed in the initial data collection phase. The purpose of this research would like to identify what variables influence IT governance processes selection. It is possible that some factors or all factors related to IT governance processes selection. The finding expresses that all seven contingency factors related to IT governance processes selection but each factors associates in different level. The highest correlated factor is strategy which refers to organizational strategy that defines a direction and strategic planning process for organization. The second highest correlated factor is culture, which refers to individual characteristics of organization. The less correlated factor is size, which refers to size of company. The rest factors namely structure, environment, technology, and task also related to IT governance selection in the medium correlation level. The other group of experts who are validators in this research also suggested that strategy of organization is a key factor to direct the way of IT governance processes selection. It is important to get a clarified policy and strong support from top management executive to set up role and teamwork including allocate all resources to support IT governance processes implementation project.

In previous study, some contingency factors were used to explain IT governance mode namely centralized, decentralized and federal that used to define IT processes and activities to deliver the effective of IT governance. It suggested that only different strategy type and size of company can reinforce to different mode of IT governance (Sambamurthy & Zmud, 1999). Literature also reviewed that effective IT governance can be achieved by implement appropriate IT governance processes (De Haes & Van Grembergen, 2008b) and it can help organization to ensure the extreme outcome which is business-IT alignment (Ko & Fink, 2010). However, past researches did not express what and how contingency factors can be used to explain the selection of IT governance process that can help organization to achieved the ultimate goal of IT governance implementation. The finding from this study can answer and explain what contingency factors and how different level of each contingency variable plays important role in selecting of each IT governance process.

This study also found the addition viewpoint from validators that apart from these contingency factors, some organizations concern about their pain point. They



selected IT governance processes based on their critical pain point but it is sustainable for IT governance process implementation because they just need to implement specific process to solve their problem. The other interested point is that organization has to concern how to maintain and sustain their governance before select such a process to implement.

#### 5.2.2 Linkage the result to research questions

This section explains the relation of research finding to each research question. This study defined two research objectives and two research questions to fulfill research gap. The first research objective is to identify and determine the effect of contingency factors influencing the selection of IT governance processes. This objective can be achieved by answering the first research question which is

*Q1: What contingency factors influence the selection of IT governance processes?*

To answer this research question, this study conducted one interviewing session and four survey rounds with nineteen experts followed Delphi technique to collect and analyze the data. From the first phase in Delphi technique which aimed to discover related factors, the result showed that almost all nineteen participants agreed upon that all seven contingency factors which were strategy, structure, size, environment, technology, task and environment related to IT governance processes selection. No new additional factor that related to IT governance emerged from this phase. Delphi technique is an iterative approach to gather data until it gains an unanimity. During all three phases in this study, the finding still revealed that all seven contingency factors influence the selection of IT governance processes. This research objective is not only to identify but also to determine the effect of contingency factors on the IT governance processes selection. The findings concur with the results from all nineteen participants that each contingency factor influenced IT governance processes selection at various levels. To identify influence level, this study used four-point Likert scale range from no influence to high influence levels. In order to get a better understanding in more detail of influence level to each IT governance process,

this study designed questionnaire by including all eighteen IT governance processes, comprising of seven contingency factors and choice of four-point Likert scale. The questionnaire can be found in Appendix D. The result indicated that each contingency factor has different influence level to each IT governance process with can be found the summarized result in Table 4-11.

In overall, the highest influence factor to IT governance processes selection is strategy and the less influence factor is size. The comparison chart of influence level with each factor can be found in Figure 4-2.

The second objective of this study is to formulate a guideline for selecting IT governance processes which is driven by contingency theory. This objective can be achieved by answering the second research question which is:

*Q2: How can contingency factors be adopted to derive an IT governance processes selection guideline that concerns business-IT strategy alignment?*

To answer this question, this study collected data from the first three phases and combined the influence level of contingency factors with the level of perception to synthesize and formulate a clustering guideline by classify them into three scenarios based on a range of level of all components (high, medium, low). In order to ensure the worthwhile of this formulated guideline, this study invited another group of experts to verify this result to find out whether it is practicable for real world or not. All three validators agreed with the guideline suggested from this study and it is applicable as a starter guideline for implementer and practitioner. The detail of three scenario guidelines can be found in Table 4-12 to Table 4-14.

## **5.3 Contribution**

### **5.3.1 Academic Contribution**

This research adopted contingency theory in MIS field as a main theory to identify the factors that influence to IT governance processes selection. The findings of this research revealed the linkages between each contingency factor and each IT governance process. Furthermore, influence level of each contingency factor that related to IT governance process is also presented. In addition, this study

demonstrated a systematic and constructive approach to formulate a clustering guideline. Therefore, this study produced the growing body of work about the understanding and explanation of IT governance processes selection driven by contingency factors. Consequently, the research results provide significant academic contributions to IT governance field of study.

Additional, this research applied the perception concept from psychology area as supplementary concept to frame the interview question in order to gather data and knowledge about implementation, important level and business-IT alignment as perceived by the experts. Perception concept has been widely used in marketing research, but it has not much been adopted in IT governance research. The findings provided the knowledge in IT governance process perception that led to an increase awareness on the important level and implementation, and business-IT alignment concerning. The study illustrated how to adapt the perception concept with regard to IT governance research that could help other IT governance researchers in extending this concept to describe other relevant topics in the field of IT governance. As this study modified the perception concept and applied it to IT governance research area, thereby this study gained a fresh perspective on conducting research in the area of IT governance.

Moreover, this research was undertaken following Delphi technique principle, which consists of three main phases to collect primary data from experts. In order to increase external validity, this study decided to extend one more phase that is validation phase. This extended phase required another group of experts to verify whether the findings and guideline were feasible and practicable. The findings revealed useful comments and valuable suggestions from validators that can increase the trustworthiness of this research's findings. This research will contribute to the knowledge about modified methodology and it will be a stepping stone for further research in this area.

### 5.3.2 Practical Contribution

For practical contribution, this study produces a contribution to the knowledge of IT governance processes in both selection and perception aspects. Firstly, knowledge of IT governance process selection, this study indicates a number of contingency factors that related to IT governance processes selection. Not only identify factor names but also reveal the influence level of each factor to each IT governance process that can help practitioner or implementer to identify the priority of relevant factor in which each organization could apply to its individual situation. Secondly, knowledge about IT governance process perception, this study presents three perceptions of each IT governance process which are implementation, important level and how support to business-IT alignment from IT governance expert's viewpoint. This can help practitioners to understand insights of each IT governance process and to exemplify viewpoint of IT governance awareness.

Moreover, this study made a contribution for practitioners not only for application of research finding, but also provides a practical guideline for IT governance field. Based on the research results, this study proposes a clustering guideline to make a contribution to knowledge for suggesting IT governance processes selection. Clustering guideline is presented under three scenarios based on the level of relevant factors. That offers a number of choices for practitioner to select a group of IT governance processes that classified by a number of clusters and influence level of relevant factors. The segment of IT governance processes from clustering guideline could help the practitioners to consider the relevance of chosen set of IT governance processes. Therefore, it can help practitioner to carefully consider and decide to use which scenario and number of segment in guideline will fit with their criteria.

Furthermore, the finding also presents similar pattern from the guideline that can help practitioners to consider a key set of IT governance processes. The outcome from this study can be used as a supplementary information at the IT governance processes selection stage for practitioners who are interested or concern to make a decision for implement IT governance processes.

In conclusion, these contributions can help researcher and practitioner to clarify and build upon an understanding of IT governance processes selection with regard to influence level of each contingency factor and perception level. Finally, this research intends to provide a systematic clustering guideline to identify and determine influence level of relevant contingency factors in IT governance processes selection.

#### **5.4 Limitation**

Limitation of research exists in every study including this study. Although this study had reached its research objectives, there were still some unavoidable limitations as presented in this section.

This research recognizes the limitation in generalizability of proposed guideline. The clustering guideline was formulated from the consensus data gathering from nineteen experts. Then, the guideline was validated by another group of experts, called as validators. Three validators were selected because they were qualified as experts in IT governance area. All of them had high experience and good knowledge in IT governance field. Face-to-face interview was conducted with each validator. The session started by presenting the finding and guideline of this research then the validators were asked to give comments whether the guideline was worthwhile and practical for the real world. All three validators accepted and agreed upon that the guideline is valuable and practical for the real world. However, the guideline was validated by only three experts and it did not have any opportunity to test in the real world. Moreover, the guideline did not provide detail of how to assess or evaluate the influence level of relevant factors.

Moreover, this research applied Delphi technique to collect primary data from experts. This technique is a widely used and accepted method for gathering the in-depth attitude from respondents within their domain of expertise. However, there is one of the most common complex in this techniques which is time consuming. Delphi technique is an iterative procedure on data collection and the repeated step can terminate when the consensus is reached. For this study, data collection technique used is Delphi technique and it spent time over one year to gain a consensus.

Furthermore, this technique aims to soliciting the idea from experts in specific field. Normally, it is hard to direct access or contact with the experts because they might be an executive who has limited of time. As mentioned that Delphi technique is an iterative mechanism procedure that needs respondents to be involved over a substantial period of time. At the beginning phase, researcher invited twenty participants to join in this research and used snowball technique to increase a number of participants. Finally, a number of participants were thirty but only nineteen persons confirmed to attend this research. While Delphi technique is beneficial to gather idea from experts, it is easy to get deny and lose experts during doing research. Additionally, the first phase of Delphi technique defines to discover the factors based on literature finding and related documentation. Following the Delphi technique, this study introduced all seven contingency factors as the initial factors to interview with experts in order to discover which factor related to IT governance processes selection. During the interview session, the researcher also asked and requested experts to suggest other factors that might related to IT governance processes selection but there was no new factor emerged. For this reason, this study also had limitation on the scope to explore other factors that may influence IT governance processes selection.

### **5.5 Future Research**

As the limitation of this research was mentioned in the previous section, some recommendations for future study will be made and presented in this last section. In order to produces broad generalizability of guideline and findings, future research should expand the data collection to include more experts and increase more validators, as well as to expand the scope of the study to test the guideline in the real world. In addition, it could be better to develop a robust assessment tool to help organizations to determine their level of relevant factors in IT governance processes selection.

Conducting Delphi technique required the development and execution of a research plan to manage timeframe since going from the start-point of Delphi procedure to the end-point to having a consensus results is taken much actual longer time than the plan. Besides, to utilize this technique it is essential to have enough

number of experts or participants to participate in the study. It needs to have a well-organized plan and documentation as well as having a commitment from participants. Moreover, to increase an opportunity to discover new factors that can influence IT governance processes selection. It could be better to apply data-driven analytics in order to explore and discover the related factors by asking open-ended questions and let the experts feel free to generate their idea.

## **5.6 Summary**

This chapter presents the overall picture of this research by concluding main research context in summary section. Then it summarized how this study achieved its all objectives which are to understand and identify variables that influence IT governance processes selection and provide the practical guideline. Moreover, the linkage of the results to each research question was described in order to ensure that the findings can answer all research questions.

The product of this study made a contribution of knowledge in IT governance process filed in both academic and practical contribution. This study also proposes a guideline for selecting IT governance processes to be implemented based on contingency theory and perception concept. It could help practitioners/organizations to select an appropriate set of IT governance processes that fit their conditions. The limitations of this research and recommendations for the future research are included at the end of this chapter.

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APPENDIX A  
Interview Guide for Phase 1

**แบบสอบถามงานวิจัย IT GOVERNANCE PROCESS SELECTION รอบที่ 1**

|                          |   |
|--------------------------|---|
| ชื่องานวิจัย             | IT Governance Processes Selection Driven by Contingency Theory<br>การเลือกกระบวนการธรรมาภิบาลด้านเทคโนโลยีสารสนเทศที่ขับเคลื่อนโดยทฤษฎีเชิงสถานการณ์  |
| วัตถุประสงค์ของงานวิจัย  | เพื่อค้นหาปัจจัยที่เกี่ยวข้องในการเลือก IT Governance Process เพื่อให้เกิดความสอดคล้องในการบริหารงานเทคโนโลยีสารสนเทศและตอบสนองความต้องการทางธุรกิจ   |
| ขั้นตอนการวิจัย          | งานวิจัยนี้ใช้วิธีการเก็บข้อมูลด้วย Delphi technique เป็นวิธีการในการเก็บรวบรวมข้อมูลจากผู้เชี่ยวชาญเฉพาะด้าน ประกอบไปด้วยขั้นตอนดังต่อไปนี้<br>รอบที่ 1: การสัมภาษณ์ตามแบบสอบถาม เพื่อค้นหาปัจจัยที่เกี่ยวข้อง<br>รอบที่ 2: การตอบแบบสอบถาม เพื่อค้นหาความสำคัญของปัจจัยที่เกี่ยวข้อง<br>รอบที่ 3: การตอบแบบสอบถาม เพื่อจัดลำดับปัจจัย |
| คำแนะนำในการตอบแบบสอบถาม | คำถามในแบบสอบถามชุดนี้ใช้เพื่อประกอบการสัมภาษณ์ในการเก็บข้อมูล รอบที่ 1 ซึ่งประกอบด้วย 3 ส่วนคือ<br>ส่วนที่ 1 : ข้อมูลทั่วไป<br>ส่วนที่ 2 : การใช้งานและความสำคัญของ IT Governance Process<br>ส่วนที่ 3 : ปัจจัยที่เกี่ยวข้องในการเลือกใช้งาน IT Governance Process   |
| ผู้วิจัย                 | ศกุนา ศรีโฉมมัย<br>email: sakuna.s@hotmail.com โทร 083-857-3337   |
| อาจารย์ที่ปรึกษา         | อาจารย์ ดร.วิชรา จันทาหับ<br>ประธานหลักสูตรเทคโนโลยีสารสนเทศเพื่อธุรกิจ<br>คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย   |

งานวิจัยชิ้นนี้เป็นส่วนหนึ่งของวิทยานิพนธ์ระดับปริญญาเอกของ  
หลักสูตร IT in Business คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย  
โดยข้อมูลทั้งหมดจะถูกเก็บรักษาเป็นความลับและใช้เพื่องานวิจัยเท่านั้น

### ส่วนที่ 1: ข้อมูลทั่วไป

#### 1. ช่วงอายุของท่าน:

- 26-30 ปี       31-35 ปี       36-40 ปี       41-45 ปี  
 46-50 ปี       51-55 ปี       56-60 ปี       อายุ 60 ปีขึ้นไป

#### 2. ระดับการศึกษาของท่าน:

- ปริญญาตรี       ปริญญาโท       ปริญญาเอก

#### 3. ตำแหน่งงานในปัจจุบันของท่าน:

#### 4. ระยะเวลาที่ท่านมีประสบการณ์ในการบริหารงานเทคโนโลยีสารสนเทศ (IT):

- ต่ำกว่า 5 ปี       6-10 ปี       11-15 ปี       16-20 ปี  
 21-25 ปี       26-30 ปี       มากกว่า 30 ปีขึ้นไป

#### 5. กลุ่มอุตสาหกรรมที่ท่านมีประสบการณ์ในการบริหารงานเทคโนโลยีสารสนเทศ (IT):

(สามารถเลือกคำตอบได้มากกว่า 1 ข้อ)

- เกษตรและอุตสาหกรรมอาหาร (ธุรกิจการเกษตร, อาหารและเครื่องดื่ม)  
 สินค้าอุปโภคบริโภค (แฟชั่น, ของใช้ในครัวเรือนและสำนักงาน, ของใช้ส่วนตัวและเวชภัณฑ์)  
 ธุรกิจการเงิน (ธนาคาร, เงินทุนและหลักทรัพย์, ประกันภัยและประกันชีวิต)  
 สินค้าอุตสาหกรรม (ยานยนต์, เครื่องจักร, วัสดุสิ่งพิมพ์, ปิโตรเคมีและเคมีภัณฑ์, บรรจภัณฑ์, เหล็ก)  
 อสังหาริมทรัพย์และก่อสร้าง (วัสดุก่อสร้าง, บริการรับเหมาก่อสร้าง, พัฒนาอสังหาริมทรัพย์)  
 ทริพยากร (พลังงานและสาธารณูปโภค, เหมืองแร่)  
 บริการ (พาณิชย์, การแพทย์, สื่อและสิ่งพิมพ์, บริการเฉพาะกิจ, การท่องเที่ยว, ขนส่งและโลจิสติกส์)  
 เทคโนโลยี (เทคโนโลยีสารสนเทศและการสื่อสาร, ชิ้นส่วนอิเล็กทรอนิกส์)  
 อื่นๆ โปรดระบุ.....

| ส่วนที่ 2 : การใช้งานและความสำคัญของ IT Governance Process |   |   |   |   |
|--|---|---|---|---|
| No.  | IT Governance Process   | การใช้งานในภาพรวม   | ระดับความสำคัญต่อองค์กร   | ส่งเสริมให้เกิด Business-IT Alignment   |
| 1  | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการกำหนดกรอบการดำเนินงานการกำกับดูแลและการบำรุงรักษา<br>(Ensure Governance Framework Setting and Maintenance) | <input type="checkbox"/> ใช้<br><input type="checkbox"/> ไม่ใช้ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 2  | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการส่งมอบผลประโยชน์<br>(Ensure Benefits Delivery)   | <input type="checkbox"/> ใช้<br><input type="checkbox"/> ไม่ใช้ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 3  | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในความเสี่ยงที่เหมาะสม<br>(Ensure Risk Optimization)  | <input type="checkbox"/> ใช้<br><input type="checkbox"/> ไม่ใช้ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 4  | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการใช้ทรัพยากรให้ได้ประโยชน์สูงสุด<br>(Ensure Resource Optimization)  | <input type="checkbox"/> ใช้<br><input type="checkbox"/> ไม่ใช้ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 5  | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในความโปร่งใสต่อผู้มีส่วนได้เสีย<br>(Ensure Stakeholder Transparency)   | <input type="checkbox"/> ใช้<br><input type="checkbox"/> ไม่ใช้ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 6  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการกรอบการดำเนินงานการบริหารงานด้าน IT<br>(Manage the IT Management Framework)                            | <input type="checkbox"/> ใช้<br><input type="checkbox"/> ไม่ใช้ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 7  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการกลยุทธ์ (Manage Strategy)  | <input type="checkbox"/> ใช้<br><input type="checkbox"/> ไม่ใช้ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 8  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการสถาปัตยกรรมองค์กร<br>(Manage Enterprise Architecture)  | <input type="checkbox"/> ใช้<br><input type="checkbox"/> ไม่ใช้ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 9  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการนวัตกรรม (Manage Innovation)   | <input type="checkbox"/> ใช้<br><input type="checkbox"/> ไม่ใช้ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |

| No. | IT Governance Process  | การใช้งานในภาพรวม   | ระดับความสำคัญต่อองค์กร   | ส่งเสริมให้เกิด Business-IT Alignment   |
|-----|--|---|---|---|
| 10  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดกลุ่มของชุดโครงการ (Manage Portfolio)              | <input type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 11  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการงบประมาณและต้นทุน (Manage Budget and Costs)     | <input type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 12  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการทรัพยากรบุคคล (Manage Human Resources)          | <input type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 13  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการความสัมพันธ์ (Manage Relationships)             | <input type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 14  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการข้อตกลงการให้บริการ (Manage Service Agreements) | <input type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 15  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการผู้ขายหรือผู้ให้บริการ (Manage Suppliers)       | <input type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 16  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการคุณภาพ (Manage Quality)                         | <input type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 17  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการความเสี่ยง (Manage Risk)                        | <input type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 18  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการความมั่นคงปลอดภัย (Manage Security)             | <input type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |

### ส่วนที่ 3 : ปัจจัยที่เกี่ยวข้องในการเลือกใช้งาน IT Governance Process

คำถาม : ท่านคิดว่ากรเลือกใช้กระบวนการธรรมาภิบาลด้านเทคโนโลยีสารสนเทศทั้ง 18 กระบวนข้างต้น มีปัจจัยใดที่มีส่วนเกี่ยวข้องหรือมีอิทธิพลต่อการตัดสินใจเลือกใช้กระบวนการดังกล่าว

| ปัจจัย  | เกี่ยวข้อง | ไม่เกี่ยวข้อง |
|---|------------|---------------|
| 1. Strategy: กลยุทธ์ขององค์กร                               |            |               |
| 2. Structure: โครงสร้างขององค์กร                            |            |               |
| 3. Size: ขนาดขององค์กร                                      |            |               |
| 4. Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม |            |               |
| 5. Technology: การเปลี่ยนแปลงของเทคโนโลยี                   |            |               |
| 6. Task: กระบวนการทำงานทางธุรกิจขององค์กร                   |            |               |
| 7. Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร      |            |               |
| 8. Other: ปัจจัยอื่นๆ โปรดระบุ                              |            |               |

APPENDIX B  
Questionnaire for Phase 2

แบบสอบถามงานวิจัย IT GOVERNANCE PROCESS SELECTION รอบที่ 2

|                          |   |
|--------------------------|---|
| ชื่องานวิจัย             | IT Governance Processes Selection Driven by Contingency Theory<br>การเลือกกระบวนการธรรมาภิบาลด้านเทคโนโลยีสารสนเทศที่ขับเคลื่อนโดยทฤษฎีเชิงสถานการณ์  |
| วัตถุประสงค์ของงานวิจัย  | เพื่อค้นหาปัจจัยที่เกี่ยวข้องในการเลือก IT Governance Process เพื่อให้เกิดความสอดคล้องในการบริหารงานเทคโนโลยีสารสนเทศและตอบสนองความต้องการทางธุรกิจ   |
| ขั้นตอนการวิจัย          | งานวิจัยนี้ใช้วิธีการเก็บข้อมูลด้วย Delphi technique เป็นวิธีการในการเก็บรวบรวมข้อมูลจากผู้เชี่ยวชาญเฉพาะด้าน ประกอบไปด้วยขั้นตอนดังต่อไปนี้<br>รอบที่ 1: การสัมภาษณ์ตามแบบสอบถาม เพื่อค้นหาปัจจัยที่เกี่ยวข้อง<br>รอบที่ 2: การตอบแบบสอบถาม เพื่อค้นหาความสำคัญของปัจจัยที่เกี่ยวข้อง<br>รอบที่ 3: การตอบแบบสอบถาม เพื่อจัดลำดับปัจจัย |
| คำแนะนำในการตอบแบบสอบถาม | แบบสอบถามชุดนี้ใช้เพื่อการเก็บข้อมูล รอบที่ 2 ประกอบด้วย 2 ส่วนคือ<br>ส่วนที่ 1: คำตอบจากการสัมภาษณ์รอบที่ 1<br>ส่วนที่ 2: ชุดคำถามปัจจัยที่เกี่ยวข้องในการเลือกใช้งาน IT Governance Process  |
| ผู้วิจัย                 | ศกุนา ศรีอินมัย<br>email: <a href="mailto:sakuna.s@hotmail.com">sakuna.s@hotmail.com</a> โทร 083-857-3337   |
| อาจารย์ที่ปรึกษา         | อาจารย์ ดร.วิชรา จันทาทับ<br>ประธานหลักสูตรเทคโนโลยีสารสนเทศเพื่อธุรกิจ<br>คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย   |

งานวิจัยชิ้นนี้เป็นส่วนหนึ่งของวิทยานิพนธ์ระดับปริญญาเอกของ  
หลักสูตร IT in Business คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย  
โดยข้อมูลทั้งหมดจะถูกเก็บรักษาเป็นความลับและใช้เพื่องานวิจัยเท่านั้น



### ส่วนที่ 1: คำตอบจากการสัมภาษณ์ในรอบที่ 1

ข้อมูลในแบบสอบถามส่วนนี้เป็นผลที่ได้จากการสัมภาษณ์ของท่านในการเก็บข้อมูลรอบที่ 1

ขอความกรุณาท่านช่วยตรวจสอบคำตอบของท่าน โดยท่านสามารถทำการเปลี่ยนแปลงคำตอบตามที่ต้องการได้

| No. | IT Governance Process  | การใช้งานในภาพรวม  | ระดับความสำคัญต่อองค์กร  | ส่งเสริมให้เกิด Business-IT Alignment  |
|-----|--|--|--|--|
| 1   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการกำหนดกรอบการดำเนินงานการกำกับดูแลและการบำรุงรักษา (Ensure Governance Framework Setting and Maintenance) | <input type="checkbox"/> ใช่<br><input checked="" type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 2   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการส่งมอบผลประโยชน์ (Ensure Benefits Delivery)   | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 3   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในความเสี่ยงที่เหมาะสม (Ensure Risk Optimization)  | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 4   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการใช้ทรัพยากรให้ได้ประโยชน์สูงสุด (Ensure Resource Optimization)  | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 5   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในความโปร่งใสต่อผู้มีส่วนได้เสีย (Ensure Stakeholder Transparency)   | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 6   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการกรอบการดำเนินงานการบริหารงานด้าน IT (Manage the IT Management Framework)                            | <input type="checkbox"/> ใช่<br><input checked="" type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input checked="" type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก            |
| 7   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการกลยุทธ์ (Manage Strategy)   | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input checked="" type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |

| No. | IT Governance Process   | การใช้งานในภาพรวม  | ระดับความสำคัญต่อองค์กร  | ส่งเสริมให้เกิด Business-IT Alignment  |
|-----|---|--|--|--|
| 8   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการสถาปัตยกรรมองค์กร (Manage Enterprise Architecture) | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input checked="" type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 9   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการนวัตกรรม (Manage Innovation)                       | <input type="checkbox"/> ใช่<br><input checked="" type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 10  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการกลุ่มของชุดโครงการ (Manage Portfolio)              | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input checked="" type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 11  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการงบประมาณและต้นทุน (Manage Budget and Costs)        | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 12  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการทรัพยากรบุคคล (Manage Human Resources)             | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 13  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการความสัมพันธ์ (Manage Relationships)                | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input checked="" type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก |
| 14  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการข้อตกลงการให้บริการ (Manage Service Agreements)    | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input checked="" type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 15  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการผู้ขายหรือผู้ให้บริการ (Manage Suppliers)          | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input checked="" type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 16  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการคุณภาพ (Manage Quality)                            | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |



| No. | IT Governance Process   | การใช้งานในภาพรวม  | ระดับความสำคัญต่อองค์กร  | ส่งเสริมให้เกิด Business-IT Alignment  |
|-----|---|--|--|--|
| 17  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการความเสี่ยง<br>(Manage Risk)            | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input checked="" type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |
| 18  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการความมั่นคงปลอดภัย<br>(Manage Security) | <input checked="" type="checkbox"/> ใช่<br><input type="checkbox"/> ไม่ใช่ | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก | <input type="checkbox"/> น้อย<br><input type="checkbox"/> ปานกลาง<br><input checked="" type="checkbox"/> มาก |

## ส่วนที่ 2 : การใช้งานและความสำคัญของ IT Governance Process

ขอความกรุณาท่านช่วยทำเครื่องหมาย ✓ ในปัจจัยที่ส่งผลการเลือกใช้ IT Governance Process

โดยแต่ละ IT Governance Process สามารถเลือกได้มากกว่า 1 ปัจจัย

| No. | IT Governance Process   | ปัจจัยที่ส่งผลการเลือกใช้ IT Governance Process   |
|-----|---|---|
| 1   | มีการประเมิน สิ่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการกำหนดกรอบการดำเนินงานการกำกับดูแลและการบำรุงรักษา<br>(Ensure Governance Framework Setting and Maintenance) | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: ภาระงานการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 2   | มีการประเมิน สิ่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการส่งมอบผลประโยชน์<br>(Ensure Benefits Delivery)   | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: ภาระงานการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 3   | มีการประเมิน สิ่งการและเฝ้าติดตาม เพื่อให้มั่นใจในความเสี่ยงที่เหมาะสม<br>(Ensure Risk Optimization)  | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: ภาระงานการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |

| No. | IT Governance Process   | ปัจจัยที่ส่งผลต่อการเลือกใช้ IT Governance Process   |
|-----|---|--|
| 4   | มีการประเมิน ตั้งการและเฝ้าติดตาม เพื่อให้มั่นใจในการใช้ทรัพยากรให้ได้ประโยชน์สูงสุด (Ensure Resource Optimization)               | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 5   | มีการประเมิน ตั้งการและเฝ้าติดตาม เพื่อให้มั่นใจในความโปร่งใสต่อผู้มีส่วนได้เสีย (Ensure Stakeholder Transparency)                | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 6   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการกรอบการดำเนินงานการบริหารงานด้าน IT (Manage the IT Management Framework) | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 7   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการกลยุทธ์ (Manage Strategy)  | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |

| No. | IT Governance Process   | ปัจจัยที่ส่งผลต่อการเลือกใช้ IT Governance Process   |
|-----|---|--|
| 8   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการสถาปัตยกรรมองค์กร (Manage Enterprise Architecture) | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 9   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการนวัตกรรม (Manage Innovation)                       | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 10  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดกลุ่มของชุดโครงการ (Manage Portfolio)                 | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 11  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการงบประมาณและต้นทุน (Manage Budget and Costs)        | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |



| No. | IT Governance Process  | ปัจจัยที่ส่งผลต่อการเลือกใช้ IT Governance Process   |
|-----|--|--|
| 12  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหาร จัดการทรัพยากรบุคคล<br>(Manage Human Resources)          | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 13  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหาร จัดการความสัมพันธ์<br>(Manage Relationships)             | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 14  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหาร จัดการข้อตกลงการให้บริการ<br>(Manage Service Agreements) | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 15  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหาร จัดการผู้ขายหรือผู้ให้บริการ<br>(Manage Suppliers)       | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: กระบวนการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |

| No. | IT Governance Process  | ปัจจัยที่ส่งผลกระทบต่อการใช้ IT Governance Process  |
|-----|--|---|
| 16  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการคุณภาพ (Manage Quality)             | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: ภาระงานการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 17  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการความเสี่ยง (Manage Risk)            | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: ภาระงานการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |
| 18  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการความมั่นคงปลอดภัย (Manage Security) | <input type="checkbox"/> 1.Strategy: กลยุทธ์ขององค์กร<br><input type="checkbox"/> 2.Structure: โครงสร้างขององค์กร<br><input type="checkbox"/> 3.Size: ขนาดขององค์กร<br><input type="checkbox"/> 4.Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม<br><input type="checkbox"/> 5.Technology: การเปลี่ยนแปลงของเทคโนโลยี<br><input type="checkbox"/> 6.Task: ภาระงานการทำงานทางธุรกิจขององค์กร<br><input type="checkbox"/> 7.Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร<br><input type="checkbox"/> 8. Other: ปัจจัยอื่นๆ โปรดระบุ..... |

ผู้วิจัยขอขอบคุณท่านเป็นอย่างยิ่ง ที่กรุณาสละเวลาและให้ความร่วมมือในการตอบแบบสอบถาม และหวังเป็นอย่างยิ่งว่าจะได้รับความร่วมมือจากท่านในโอกาสต่อไป

## APPENDIX C

## Questionnaire for Phase 3 Round 1

## แบบสอบถามงานวิจัย IT GOVERNANCE PROCESS SELECTION รอบที่ 3 ครั้งที่ 1

**ชื่องานวิจัย** IT Governance Processes Selection Driven by Contingency Theory  
การเลือกกระบวนการธรรมาภิบาลด้านเทคโนโลยีสารสนเทศที่ขับเคลื่อนโดยทฤษฎีเชิงสถานการณ์

**วัตถุประสงค์ของงานวิจัย** เพื่อค้นหาปัจจัยที่เกี่ยวข้องในการเลือก IT Governance Process เพื่อให้เกิดความสอดคล้องในการบริหารงานเทคโนโลยีสารสนเทศและตอบสนองความต้องการทางธุรกิจ

**ขั้นตอนการวิจัย** งานวิจัยนี้ใช้วิธีการเก็บข้อมูลด้วย Delphi technique เป็นวิธีการในการเก็บรวบรวมข้อมูลจากผู้เชี่ยวชาญเฉพาะด้าน ประกอบไปด้วยขั้นตอนดังต่อไปนี้  
รอบที่ 1: การสัมภาษณ์ตามแบบสอบถาม เพื่อค้นหาปัจจัยที่เกี่ยวข้อง  
รอบที่ 2: การตอบแบบสอบถาม เพื่อค้นหาความสำคัญของปัจจัยที่เกี่ยวข้อง  
รอบที่ 3: การตอบแบบสอบถาม เพื่อจัดลำดับปัจจัย

**คำแนะนำในการตอบแบบสอบถาม** แบบสอบถามชุดนี้ใช้เพื่อการเก็บข้อมูล รอบที่ 3 ครั้งที่ 1 ประกอบด้วย 2 ส่วนคือ  
ส่วนที่ 1: สรุปผลจากการเก็บข้อมูลในรอบที่ 1 และ 2  
ส่วนที่ 2: การจัดลำดับปัจจัยในการเลือกใช้งาน IT Governance Process

**ผู้วิจัย** สกุนา ศรีอินมัย  
email: sakuna.s@hotmail.com โทร 083-857-3337

**อาจารย์ที่ปรึกษา** อาจารย์ ดร.วิฑรา จันทาทับ  
ประธานหลักสูตรเทคโนโลยีสารสนเทศเพื่อธุรกิจ  
คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย

งานวิจัยชิ้นนี้เป็นส่วนหนึ่งของวิทยานิพนธ์ระดับปริญญาเอกของ  
หลักสูตร IT in Business คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย  
โดยข้อมูลทั้งหมดจะถูกเก็บรักษาเป็นความลับและใช้เพื่องานวิจัยเท่านั้น

### ส่วนที่ 1: สรุปผลจากการเก็บข้อมูลในรอบที่ 1 และ 2

ข้อมูลในแบบสอบถามส่วนนี้เป็นการนำเสนอผลสรุปที่ได้การเก็บข้อมูลในรอบที่ 1 และ 2

| No. | IT Governance Process  | การใช้งาน<br>ในภาพรวม | สำคัญ<br>ระดับสูงต่อ<br>องค์กร | สนับสนุนระดับสูง<br>ให้เกิด Business-<br>IT Alignment |
|-----|--|-----------------------|--------------------------------|---|
| 1   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการกำหนดกรอบการดำเนินงานการกำกับดูแลและการบำรุงรักษา (Ensure Governance Framework Setting and Maintenance) | 84%                   | 89%                            | 68%   |
| 2   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการส่งมอบผลประโยชน์ (Ensure Benefits Delivery)   | 63%                   | 74%                            | 79%   |
| 3   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในความเสี่ยงที่เหมาะสม (Ensure Risk Optimization)  | 84%                   | 63%                            | 42%   |
| 4   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการใช้ทรัพยากรให้ได้ประโยชน์สูงสุด (Ensure Resource Optimization)  | 84%                   | 42%                            | 47%   |
| 5   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในความโปร่งใสต่อผู้มีส่วนได้เสีย (Ensure Stakeholder Transparency)   | 42%                   | 53%                            | 37%   |
| 6   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการกรอบการดำเนินงานการบริหารงานด้าน IT (Manage the IT Management Framework)                            | 79%                   | 79%                            | 79%   |
| 7   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการกลยุทธ์ (Manage Strategy)   | 84%                   | 74%                            | 74%   |
| 8   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการสถาปัตยกรรมองค์กร (Manage Enterprise Architecture)  | 42%                   | 58%                            | 63%   |
| 9   | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการนวัตกรรม (Manage Innovation)  | 63%                   | 21%                            | 21%   |
| 10  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการกลุ่มของชุดโครงการ (Manage Portfolio)   | 53%                   | 42%                            | 47%   |
| 11  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการงบประมาณและต้นทุน (Manage Budget and Costs)   | 89%                   | 68%                            | 53%   |
| 12  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการทรัพยากรบุคคล (Manage Human Resources)  | 89%                   | 63%                            | 53%   |
| 13  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการความสัมพันธ์ (Manage Relationships)   | 79%                   | 63%                            | 58%   |
| 14  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการข้อตกลงการให้บริการ (Manage Service Agreements)   | 89%                   | 68%                            | 58%   |



| No. | IT Governance Process  | การใช้งาน<br>ในภาพรวม | สำคัญ<br>ระดับสูงต่อ<br>องค์กร | สนับสนุนระดับสูง<br>ให้เกิด Business-<br>IT Alignment |
|-----|--|-----------------------|--------------------------------|---|
| 15  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการผู้ขาย<br>หรือผู้ให้บริการ (Manage Suppliers) | 79%                   | 58%                            | 26%   |
| 16  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการคุณภาพ<br>(Manage Quality)                    | 79%                   | 58%                            | 32%   |
| 17  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการความ<br>เสี่ยง (Manage Risk)                  | 74%                   | 68%                            | 37%   |
| 18  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหารจัดการความ<br>มั่นคงปลอดภัย (Manage Security)       | 89%                   | 79%                            | 42%   |

## ส่วนที่ 2 : การจัดลำดับปัจจัยในการเลือกใช้งาน IT Governance Process

ขอความท่าน โปรดจัดอันดับอิทธิพลของปัจจัยทั้ง 7 ที่เกี่ยวข้องต่อการพิจารณาเลือกใช้งาน IT Governance Process

|               | 1 (มากที่สุด)         | 2                     | 3                     | 4                     | 5                     | 6                     | 7 (น้อยสุด)           |
|---------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1.Strategy    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2.Structure   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3.Size        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4.Environment | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5.Technology  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6.Task        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7.Culture     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

### คำอธิบายปัจจัย

1. Strategy: กลยุทธ์ขององค์กร
2. Structure: โครงสร้างขององค์กร
3. Size: ขนาดขององค์กร
4. Environment: ปัจจัยภายนอก เช่น กฎระเบียบ กลุ่มอุตสาหกรรม
5. Technology: การเปลี่ยนแปลงของเทคโนโลยี
6. Task: ภาระงานทางธุรกิจขององค์กร
7. Culture: วัฒนธรรมขององค์กร หรือปัจจัยภายในขององค์กร

ผู้วิจัยขอขอบคุณท่านเป็นอย่างยิ่ง ที่กรุณาใช้เวลาและให้ความร่วมมือในการตอบแบบสอบถาม และหวังเป็นอย่างยิ่งว่าจะได้รับความร่วมมือจากท่านในโอกาสต่อไป

## APPENDIX D

## Questionnaire for Phase 3 Round 2

## แบบสอบถามงานวิจัย IT GOVERNANCE PROCESS SELECTION รอบที่ 3 ครั้งที่ 2

|                          |  |
|--------------------------|--|
| ชื่องานวิจัย             | IT Governance Processes Selection Driven by Contingency Theory<br>การเลือกกระบวนการธรรมาภิบาลด้านเทคโนโลยีสารสนเทศที่ขับเคลื่อนโดยทฤษฎีเชิงสถานการณ์   |
| วัตถุประสงค์ของงานวิจัย  | เพื่อค้นหาปัจจัยที่เกี่ยวข้องในการเลือก IT Governance Process เพื่อให้เกิดความสอดคล้องในการบริหารงานเทคโนโลยีสารสนเทศและตอบสนองความต้องการทางธุรกิจ  |
| ขั้นตอนการวิจัย          | งานวิจัยนี้ใช้วิธีการเก็บข้อมูลด้วย Delphi technique เป็นวิธีการในการเก็บรวบรวมข้อมูลจากผู้เชี่ยวชาญเฉพาะด้าน ประกอบไปด้วยขั้นตอนดังต่อไปนี้<br>รอบที่ 1: การสัมภาษณ์ตามแบบสอบถาม เพื่อค้นหาปัจจัยที่เกี่ยวข้อง<br>รอบที่ 2: การตอบแบบสอบถาม เพื่อค้นหาความสำคัญของปัจจัยที่เกี่ยวข้อง<br>รอบที่ 3: การตอบแบบสอบถาม เพื่อจัดลำดับปัจจัย  |
| คำแนะนำในการตอบแบบสอบถาม | แบบสอบถามชุดประกอบด้วย 1 ชุดคำถามเกี่ยวกับจัดลำดับอิทธิพลของแต่ละปัจจัยที่ส่งผลต่อการเลือกใช้ IT Governance Process โดยมี 4 ระดับประกอบด้วย <ul style="list-style-type: none"> <li>• ส่งผลมาก หมายถึง ปัจจัยนั้นมีอิทธิพลหรือส่งผลระดับสูง ต่อการเลือกใช้กระบวนการ</li> <li>• ส่งผลปานกลาง หมายถึง ปัจจัยนั้นมีอิทธิพลหรือส่งผลระดับปานกลาง ต่อการเลือกใช้กระบวนการ</li> <li>• ส่งผลน้อย หมายถึง ปัจจัยนั้นมีอิทธิพลหรือส่งผลระดับน้อย ต่อการเลือกใช้กระบวนการ</li> <li>• ไม่มีผล หมายถึง ปัจจัยนั้นไม่มีอิทธิพลหรือไม่ส่งผลต่อการเลือกใช้กระบวนการ</li> </ul> |
| ผู้วิจัย                 | สกุณา ศรีอินมัย<br>email: sakuna.s@hotmail.com โทร 083-857-3337  |
| อาจารย์ที่ปรึกษา         | อาจารย์ ดร. วีระา จันทาหับ<br>ประธานหลักสูตรเทคโนโลยีสารสนเทศเพื่อธุรกิจ<br>คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย   |

งานวิจัยชิ้นนี้เป็นส่วนหนึ่งของวิทยานิพนธ์ระดับปริญญาเอกของ  
หลักสูตร IT in Business คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย  
โดยข้อมูลทั้งหมดจะถูกเก็บรักษาเป็นความลับและใช้เพื่องานวิจัยเท่านั้น

### ชุดคำถามการจัดลำดับอิทธิพลของแต่ละปัจจัยที่ส่งผลต่อการเลือกใช้ IT Governance Process

กรุณาทำเครื่องหมาย ✓ ในคำตอบที่ท่านต้องการ โดยแต่ละกระบวนการ สามารถเลือกคำตอบได้มากกว่า 1 ปัจจัย

| No. | IT Governance Process  | ระดับปัจจัยที่ส่งผลต่อการเลือกใช้ IT Governance Process  |
|-----|--|--|
| 1   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการกำหนดกรอบการดำเนินงานการกำกับดูแลและการบำรุงรักษา (Ensure Governance Framework Setting and Maintenance) | 1.Strategy กลยุทธ์ขององค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>2.Structure โครงสร้างองค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>3.Size ขนาดขององค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>4.Environment ปัจจัยภายนอก: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>5.Technology เทคโนโลยี: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>6.Task กระบวนการทำงาน: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>7.Cultureวัฒนธรรมองค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล |
| 2   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการส่งมอบผลประโยชน์ (Ensure Benefits Delivery)   | 1.Strategy กลยุทธ์ขององค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>2.Structure โครงสร้างองค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>3.Size ขนาดขององค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>4.Environment ปัจจัยภายนอก: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>5.Technology เทคโนโลยี: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>6.Task กระบวนการทำงาน: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>7.Cultureวัฒนธรรมองค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล |
| 3   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในความเสถียรที่เหมาะสม (Ensure Risk Optimization)  | 1.Strategy กลยุทธ์ขององค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>2.Structure โครงสร้างองค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>3.Size ขนาดขององค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>4.Environment ปัจจัยภายนอก: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>5.Technology เทคโนโลยี: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>6.Task กระบวนการทำงาน: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>7.Cultureวัฒนธรรมองค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล |
| 4   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในการใช้ทรัพยากรให้ได้ประโยชน์สูงสุด (Ensure Resource Optimization)  | 1.Strategy กลยุทธ์ขององค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>2.Structure โครงสร้างองค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>3.Size ขนาดขององค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>4.Environment ปัจจัยภายนอก: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>5.Technology เทคโนโลยี: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>6.Task กระบวนการทำงาน: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>7.Cultureวัฒนธรรมองค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล |
| 5   | มีการประเมิน สั่งการและเฝ้าติดตาม เพื่อให้มั่นใจในความโปร่งใสต่อผู้มีส่วนได้เสีย   | 1.Strategy กลยุทธ์ขององค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>2.Structure โครงสร้างองค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล<br>3.Size ขนาดขององค์กร: <input type="checkbox"/> ส่งผลมาก <input type="checkbox"/> ส่งผลปานกลาง <input type="checkbox"/> ส่งผลน้อย <input type="checkbox"/> ไม่ส่งผล   |







| No. | IT Governance Process   | ระดับปัจจัยที่ส่งผลต่อการเลือกใช้ IT Governance Process |                                   |                                       |                                    |                                   |
|-----|---|---|-----------------------------------|---------------------------------------|------------------------------------|-----------------------------------|
|     |   | 7.Cultureวัฒนธรรมองค์กร:                                | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
| 15  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหาร จัดการผู้ขายหรือผู้ให้บริการ (Manage Suppliers) | 1.Strategy กลยุทธ์ขององค์กร:                            | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 2.Structure โครงสร้างองค์กร:                            | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 3.Size ขนาดขององค์กร:                                   | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 4.Environment ปัจจัยภายนอก:                             | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 5.Technology เทคโนโลยี:                                 | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 6.Task กระบวนการทำงาน:                                  | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 7.Cultureวัฒนธรรมองค์กร:                                | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
| 16  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหาร จัดการคุณภาพ (Manage Quality)                   | 1.Strategy กลยุทธ์ขององค์กร:                            | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 2.Structure โครงสร้างองค์กร:                            | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 3.Size ขนาดขององค์กร:                                   | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 4.Environment ปัจจัยภายนอก:                             | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 5.Technology เทคโนโลยี:                                 | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 6.Task กระบวนการทำงาน:                                  | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 7.Cultureวัฒนธรรมองค์กร:                                | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
| 17  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหาร จัดการความเสี่ยง (Manage Risk)                  | 1.Strategy กลยุทธ์ขององค์กร:                            | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 2.Structure โครงสร้างองค์กร:                            | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 3.Size ขนาดขององค์กร:                                   | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 4.Environment ปัจจัยภายนอก:                             | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 5.Technology เทคโนโลยี:                                 | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 6.Task กระบวนการทำงาน:                                  | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 7.Cultureวัฒนธรรมองค์กร:                                | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
| 18  | มีการจัดวางแนวทาง จัดทำแผน และจัดระบบ ด้านการบริหาร จัดการความมั่นคงปลอดภัย (Manage Security)       | 1.Strategy กลยุทธ์ขององค์กร:                            | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 2.Structure โครงสร้างองค์กร:                            | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 3.Size ขนาดขององค์กร:                                   | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 4.Environment ปัจจัยภายนอก:                             | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 5.Technology เทคโนโลยี:                                 | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 6.Task กระบวนการทำงาน:                                  | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |
|     |   | 7.Cultureวัฒนธรรมองค์กร:                                | <input type="checkbox"/> ส่งผลมาก | <input type="checkbox"/> ส่งผลปานกลาง | <input type="checkbox"/> ส่งผลน้อย | <input type="checkbox"/> ไม่ส่งผล |

ผู้วิจัยขอขอบคุณท่านเป็นอย่างยิ่ง ที่กรุณาสละเวลาและให้ความร่วมมือในการตอบแบบสอบถาม และหวังเป็นอย่างยิ่งว่าจะได้รับความร่วมมือจากท่านในโอกาสต่อไป

## VITA

Sakuna Srianomai was born in 1976 as the first daughter from Smithisomboon family. She graduated with a bachelor's degree in applied statistics from King Mongkut's Institute of Technology Ladkrabang, and master's degree in management information system (MIS) from Chulalongkorn University Thailand. She earned an English-Business certificated from University of Washington, USA.

Sakuna had extensive experience in IT management, planning and consulting. She is an IT consultant with specialized in IT service management and Enterprise Resource Planning (ERP) especially in Human Capital Management (HCM) module. She got a SAP consultant certificated and ITIL certificated. She used to work in Information Technology office of Chulalongkorn University for SAP implementation project. She also worked with many professors in Chulalongkorn University in many consulting projects. Her clients were from many various organizations including both public and private firms.

