**AUTHOR:** OMAR, A.

**TITLE:** Insourcing a government information system: a case study from Malaysia.

**YEAR:** 2017



This work was submitted to- and approved by Robert Gordon University in partial fulfilment of the following degree:
Doctor of Philosophy, School of Computing Science and Digital Media.

# INSOURCING A GOVERNMENT INFORMATION SYSTEM: A CASE STUDY FROM MALAYSIA

**AZMI OMAR**

A thesis submitted in partial fulfilment of the requirement of the
Robert Gordon University
for the degree of Doctor of Philosophy

**June 2017**

# TABLE OF CONTENTS

**TABLE OF CONTENTS** ..... **i**

**LIST OF TABLES** ..... **vi**

**LIST OF FIGURES** ..... **vii**

**LIST OF ABBREVIATIONS** ..... **viii**

**DECLARATION** ..... **x**

**ACKNOWLEDGEMENTS** ..... **xi**

**ABSTRACT** ..... **xii**

**CHAPTER 1: INTRODUCTION** ..... **1**

1. INTRODUCTION AND RATIONALE ..... 1

1.1 RESEARCH AIMS ..... 5

1.2 RESEARCH CONTRIBUTIONS ..... 6

1.3 LIST OF PUBLICATIONS ..... 7

1.4 THESIS STRUCTURE ..... 7

**CHAPTER 2: LITERATURE REVIEW** ..... **9**

2. INTRODUCTION ..... 9

2.1 SUCCESS FACTORS FOR IT IMPLEMENTATION ..... 9

2.2 BARRIERS TO IT IMPLEMENTATION ..... 14

2.3 GOVERNMENT INFORMATION SYSTEMS ..... 16

2.4 INFORMATION SYSTEM IN DEVELOPING COUNTRIES ..... 18

2.5 INFORMATION SYSTEM PROCUREMENT ..... 20

2.5.1 Outsourcing ..... 21

2.5.2 Co-sourcing ..... 22

2.6 INSOURCING ..... 23

2.6.1 ICT and Insourcing ..... 25

2.6.2 Insourcing Implementation ..... 26

2.7 ANALYTICAL THEORIES AND FRAMEWORKS ..... 33
2.7.1 Transaction Cost Economics ..... 33
2.7.2 Resource-based View Theory ..... 34
2.7.3 Agency Theory ..... 34
2.7.4 Institutional Theory ..... 35
2.7.5 Capability Approach ..... 36
2.8 SUMMARY OF CHAPTER AND CONCLUSION ..... 37
**CHAPTER 3: AN ANALYTICAL FRAMEWORK ..... 38**
3. INTRODUCTION ..... 38
3.1 OPTIMISM MODEL ..... 38
a. Objectives and Values ..... 39
b. Processes ..... 40
c. Technology ..... 40
d. Information ..... 41
e. Management Systems and Structures ..... 41
f. Investment Resources ..... 41
g. Staffing and Skills ..... 42
h. Milieu ..... 42
3.2 INSTITUTIONAL THEORY ..... 43
3.2.1 The pillars of Institutions ..... 44
a. Regulative ..... 45
b. Normative ..... 46
c. Cultural Cognitive ..... 47
3.2.2 Application of Institutional Analysis in IS/ICT ..... 47
3.3 CAPABILITY APPROACH ..... 49
3.3.1 Capabilities ..... 50
3.3.2 Functionings ..... 50

3.3.3 Agency and Choice ..... 51
3.3.4 Application of Capability Approach in IS/ICT ..... 51
3.4 COMBINATION OF INSTITUTIONAL THEORY AND THE CAPABILITY APPROACH ..... 52
3.4.1 Description of Framework ..... 53
3.5 MAPPING OPTIMISM MODEL WITH THE ANALYTICAL FRAMEWORK ..... 56
3.6 SOURCING FRAMEWORK ..... 59
3.6.1 The Enhanced Model ..... 61
3.6.2 The List of Dimensions ..... 64
3.7 SUMMARY OF CHAPTER AND CONCLUSIONS ..... 66
**CHAPTER 4: RESEARCH METHODOLOGY ..... 67**
4. INTRODUCTION ..... 67
4.1 PHILOSOPHICAL PERSPECTIVE ..... 67
4.2 RESEARCH DESIGN ..... 68
4.2.1 Research Methodology: The Qualitative Method ..... 68
4.2.2 Research Approach: The Case Study Approach ..... 69
4.2.3 Data Collection Methods: Interview and Review of Documents ..... 72
4.2.4 Analysis Technique: Using Grounded Theory Coding Principles ..... 74
4.3 EMPIRICAL RESEARCH ..... 75
4.3.1 The Selection of the Research Site ..... 75
4.3.2 Participants Selection ..... 77
4.3.3 Data Collection ..... 81
4.3.4 Secondary Data Sources ..... 84
4.3.5 Data Analysis ..... 84
(i) Transcription Process ..... 85
(ii) Open Coding ..... 86
(iii) Memoing ..... 87
(iv) Constant Comparison ..... 88

4.4 TRANSCRIPTION AND TRANSLATION ..... 90
4.5 ETHICAL CONSIDERATIONS ..... 91
4.6 RELIABILITY AND VALIDITY ..... 92
4.7 SUMMARY OF CHAPTER AND CONCLUSIONS ..... 93
**CHAPTER 5: FINDINGS ..... 94**
5. INTRODUCTION ..... 94
5.1 INSTITUTIONS – CAPABILITIES (DIMENSION A) ..... 99
5.1.1 Training resources ..... 99
5.1.2 Management Skills ..... 101
5.1.3 Lack of Recognition ..... 104
5.1.4 Negative User Perception ..... 106
5.2 CAPABILITIES – TECHNOLOGY (DIMENSION B) ..... 108
5.2.1 Technical Training for HRMIS Technologies ..... 109
5.2.2 Creating a Pool of Programmers ..... 112
5.2.3 Quality of Services ..... 113
5.2.4 Lack of Infrastructure to Support User Access ..... 116
5.2.5 Lack of Java Expertise ..... 118
5.3 INSTITUTIONS – TECHNOLOGY (DIMENSION C) ..... 120
5.3.1 Data Centralisation ..... 121
5.3.2 Government Support for the Network Infrastructure ..... 123
5.3.3 System Complexity ..... 124
5.3.4 Government Regulatory Policies ..... 127
5.4 COST (DIMENSION A, B, C) ..... 129
5.5 SUMMARY OF CHAPTER AND CONCLUSIONS ..... 131
**CHAPTER 6: DISCUSSION ..... 133**
6. INTRODUCTION ..... 133
6.1 CAPACITY BUILDING OF THE INTERNAL DEVELOPMENT TEAM ..... 134

6.1.1 Access to Advanced Technology ..... 135
6.1.2 Government Cost Efficiency ..... 137
6.2 SUMMARY OF CHAPTER AND CONCLUSIONS ..... 138
**CHAPTER 7: CONCLUSIONS ..... 139**
7. INTRODUCTION ..... 139
7.1 SUMMARY OF THE THESIS ..... 139
7.2 RESEARCH QUESTIONS REVISITED ..... 140
7.3 RESEARCH LIMITATIONS ..... 142
7.4 RESEARCH CONTRIBUTIONS ..... 143
7.4.1 Contributions to Practice ..... 144
7.4.2 Contributions to Theory ..... 146
7.5 LESSONS FOR FUTURE RESEARCH ..... 147
7.6 RECOMMENDATIONS ..... 149
7.7 FUTURE RESEARCH ..... 152
**BIBLIOGRAPHY ..... 154**
**APPENDIX 1 – LIST OF JOURNALS CONSULTED ..... 175**
**APPENDIX 2 – LIST OF USER PARTICIPANT'S ORGANISATION ..... 176**
**APPENDIX 3 – INTERVIEW GUIDE 1 ..... 177**
**APPENDIX 4 – INTERVIEW GUIDE 2 ..... 183**
**APPENDIX 5 – DETAILS OF DATA ANALYSIS ..... 186**
**APPENDIX 6 – SAMPLE INTERVIEW ..... 207**
**APPENDIX 7 – CONSENT LETTER ..... 223**

## LIST OF TABLES

Table 2.1: Framework for Analysis of ICT-based Development Initiatives (Source: Walsham, 2010) ..... 19
Table 2.2: A Breakdown of the Databases ..... 28
Table 2.3: Selected Previous Studies on Insourcing ..... 29
Table 3.1: The Three Pillars of Institution (Source: Scott, 2013) ..... 45
Table 4.1: The Rationale of Adopting a Case Study ..... 71
Table 4.2: The Rationale Adopting of a Semi-Structured Interview ..... 73
Table 4.3: The Number of Research Participants ..... 78
Table 4.4: Participating Organisations and Interviewee Job Titles. ..... 79
Table 4.5: Participants in the Second Phase of Data Collection ..... 80
Table 4.6: Data Collection Periods ..... 81
Table 4.7: Breakdown of Respondents by Group ..... 81
Table 4.8: Appropriate Data Gathering Techniques and Sources based on the Research Questions ..... 82
Table 4.9: A Preview of the Key-Points and Codes (First Data Collection) ..... 89
Table 4.10: A Preview of the Key-Points and Codes (Second Data Collection)... 90
Table 7.1: Track Expertise and Areas of Specialization (Source: Bahagian Perkhidmatan, 2010) ..... 150
Table 7.2: Skills Framework for the Information Age (SFIA) Version 6 (Source: SFIA, 2015) ..... 150

# LIST OF FIGURES

Figure 2.1: Dimensional contingency (Source: Leavitt, 1965) ..... 10
Figure 2.2: Temporal, systemic contingency (Source: Heeks, 2002a) ..... 11
Figure 2.3: Design-reality gap (Source: Heeks, 2002a)..... 12
Figure 2.4: Success Factors for IT Implementation..... 13
Figure 2.5: Barriers to IT Implementation..... 15
Figure 2.6: Types of Sourcing Arrangement (Source: Moe et al., 2012 and Moe et al., 2014)..... 21
Figure 3.1: Institutional Theory, the Capability Approach, and ICT (Source: Bass et al., 2013) ..... 54
Figure 3.2: Adaptation of the Framework..... 55
Figure 3.3: Mapping the Analytical Framework with OPTIMISM Model ..... 57
Figure 3.4: The Analytical Framework Model Enhancement..... 63
Figure 4.1: Steps of the Coding Principles from Grounded Theory (Source: Strauss & Corbin, 1998) ..... 87
Figure 4.2: A Memo on Competencies of the Officer ..... 87
Figure 4.3: Example of the Emergence of a Category from Underlying Concepts ..... 89
Figure 5.1: The Exciters and Inhibitors in All Dimensions (Adapted from Bass et al. (2013))..... 98
Figure 5.2: The Exciters and Inhibitors in Dimension A ..... 99
Figure 5.3: The Exciters and Inhibitors in Dimension B ..... 109
Figure 5.4: The Exciters and Inhibitors in Dimension C ..... 121

## LIST OF ABBREVIATIONS

| | |
|---|---|
| ASP: | Active Server Pages |
| CIO: | Chief Information Officer |
| CSS: | Cascading Style Sheets |
| eGL: | Electronic Guarantee Letter |
| EIS: | Executive Information System |
| ETP: | Economic Transformation Program |
| GO: | General Order |
| GSD: | Global Software Development |
| GTP: | Government Transformation Programme |
| HR: | Human Resources |
| HRMIS: | Human Resource Management Information System |
| HTML: | HyperText Markup Language |
| ICT: | Information and Communication Technology |
| ICT4D: | Information and Communications Technologies for Development |
| IE: | Internet Explorer |
| IEEE: | The Institute of Electrical and Electronics Engineers |
| IFIP: | The International Federation for Information Processing |
| INTAN: | Institut Tadbiran Awam Negara (The National Institute of Public Administration) |
| iOS: | Phone OS |
| IS: | Information System |
| ISD: | Information System Development |
| IT: | Information Technology |
| ITPOSMO: | **I**nformation; **T**echnology; **P**rocesses; **O**bjectives and values; **S**taffing and skills; **M**anagement systems and structures; and **O**ther resources (time and money) |
| LMIS: | Land Management Information System |
| LNPT: | Laporan Nilaian Prestasi Tahunan (Annual Performance Evaluation Report) |
| MAMPU: | Malaysian Administrative Modernisation and Management Planning Unit |

| | |
|---|---|
| MO: | Module Owner |
| MSC: | Multimedia Super Corridor |
| NEM: | New Economic Model |
| OECD: | The Organisation for Economic Co-operation and Development |
| OPTIMISM: | **O**bjectives and values; **P**rocesses; **T**echnology; **I**nformation; **M**anagement systems and structures; **I**nvestment resources; **S**taffing and skills; and **M**ilieu |
| PM: | Project Management |
| PO: | Process Owner |
| PSD: | Public Service Department of Malaysia |
| R&D: | Research and Development |
| TCE: | Transaction Cost Economics |
| TCT: | Transaction Cost Theory |
| TRM: | Training Road Map |
| SET: | Social Exchange Theory |

## DECLARATION

I, Azmi Omar declare that this thesis, submitted in partial fulfilment of the requirements for the award of Doctor of Philosophy, in the School of Computing Science and Digital Media, Robert Gordon University, is wholly my own work unless otherwise referenced and acknowledged. This work has not previously been submitted for any qualification at any academic institution.

"This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself."

**Azmi Omar**

## ACKNOWLEDGEMENTS

Firstly, I would like to express my deepest gratitude and appreciation to my supervisory team, Dr Julian M. Bass, Mr Peter Lowit, and Dr Mathew Nicho for their excellent supervision, guidance, constructive feedback, encouragement, kind support, and advice during my PhD.

I would also like to extend my special thanks to the Public Service Department of Malaysia for awarding the scholarship and study leave for my PhD. I also thank the staff of the Human Capital Development Division of the Public Service Department of Malaysia and the academic staff of the Malaysian Embassy in London. Additionally, I express great thanks to all staff the School of Computing Science and Digital Media (CSDM) at Robert Gordon University for their kind support during my PhD studies.

My greatest indebtedness is to my mother Hajjah Maznah Binti Hashim. I cannot find adequate words to express how essential her inspiration and support has been in bringing me to this point. I would not be here without her patience, continuous encouragement and thoughtful advice during my studies. I also dedicate this thesis to my beloved late father Haji Omar Bin Ahmed, who has been and always will be my role model. I also owe special thanks to my siblings Ahmad, Osman, Latifah, Rosidah, Mahani, Mazlina and Suriyaty as well as all my friends in Malaysia and the UK, especially Dr Abubakar Dahiru, Dr Muhammad Zubir Yusof, Dr Firdaus Muhammad Sukki, Dr Mohd Azlan Zaharuddin and Abdul Wahab Alif Maula Fajaruddin for their moral support, continuous prayers and endless patience.

Lastly, many thanks go to all the participants in my research study for their cooperation and for providing me with a wealth of information related to insourcing a government information system in Malaysia.

## ABSTRACT

Insourcing, outsourcing and co-sourcing are three approaches to procuring an information system. This research contributes to the body of knowledge on insourcing an information system; exploring and discussing the enabling and inhibiting factors of the insourcing of an information system in selected government agencies in Malaysia. This study was undertaken in response to a paucity of similar projects and a limited literature focused on developing countries. It considers the post outsourcing context following the decision to insource a major Malaysian Government Information System in 2011.

A qualitative research method was used to obtain empirical evidence from selected government agencies through 69 semi-structured interviews in two data collection periods: 2013-2014 and 2015. Interviews were conducted with civil servants at all levels, from senior management to clerical staff, including users of the government information system. By using coding principles from grounded theory to analyse the data, seven exciters and six inhibitors of insourcing a government information system were identified and mapped in the analytical framework. Further, this is the first research to use an enhanced model, devised by combining the OPTIMISM model and two distinct theoretical traditions: institutional theory and the capability approach; in order to analyse the insourcing of government information system adoption. The enhanced model was created by mapping the OPTIMISM model (that has a set of dimensions) to an analytical framework comprising the capability approach, institutional theory and technology (ICTs).

The main research contribution of this thesis is in the area of capacity building of the internal development team. The increased budget for training, the selection of appropriate training providers and knowledge sharing among experienced and novice developers all contribute to building capacity in the internal development team; and consequently help to improve the quality of the system which will improve service delivery to the general public. The approach and findings of this study contribute to the body of knowledge and understanding of the subject in government information system development and implementation, and can also be applied to improving the quality of service delivery. While this study has focused on government information systems, the wider area of eGovernment, and

applications serving the needs of the general public, is equally important, and therefore the researcher suggests that insourcing eGovernment applications would also assist in the capacity building of internal IT staff.

**Keywords:** *insourcing, outsourcing, government information system, institutional theory, the capability approach, OPTIMISM model, exciters, inhibitors, semi-structured interview, qualitative methods*

# CHAPTER 1: INTRODUCTION

## 1. INTRODUCTION AND RATIONALE

This research aims to contribute to the existing body of knowledge on insourcing a government information system (IS). It will study a large IS, and identify the enabling and inhibiting factors of insourcing in a public organisation. The underlying purpose of the research is to contribute useful findings to the literature in the area of insourcing an IS.

Government ISs are typically large and complex. They play an important role in ensuring that the organisation delivers the information and communication services that are needed by civil servants (Sundgren, 2005) in order to provide effective and efficient online public services. Information managed by the government needs to be relevant, accurate, and up-to-date to be able to provide high-quality information (Gilbert et al., 2004). Systems used by governments include areas of human resources, financial management, health, and education. Insourcing, outsourcing, and co-sourcing are the three types of approach that can be followed when developing a complete IS (Ahmad Nawi et al., 2012).

Outsourcing can be defined as the appointment of a third party service provider or vendor to perform and complete a prescribed task within a specific length of time (Oshri et al., 2009). Insourcing can be defined as bringing back the functionality of IS development and maintenance from the vendor to the organisation, using internal resources after the termination of a vendor contract.

In recent years, outsourcing has been the preferred approach, given its focus on reducing both the costs and risks related to business and technology, allowing an organisation to focus on its core business (Lacity et al., 2011a; Lacity et al., 2010; Ahonen et al., 2009; Dibbern et al., 2004).

However, despite its ubiquity, outsourcing is not a perfect solution for systems development and maintenance, as IT outsourcing tends to be more complex when compared to other forms of outsourcing (Kern & Willcocks, 2002). For instance, JP Morgan Chase & Co terminated their contract with the outsourcing vendor IBM two

years into a seven-year contract, and brought back all IT functions in-house in an arrangement worth $5 billion (Cowley, 2004).

According to Qu et al. (2010), worldwide spending on IT outsourcing increased rapidly from $268 billion in 2009 to $325 billion by 2013, suggesting that governments will need to invest more money in IT outsourcing. Raisinghani et al. (2008) emphasise that the complexity of IT/IS projects and metrics mean that it is increasingly difficult to evaluate the long-term value and effectiveness of offshore outsourcing, finding that IT outsourcing represents at least 80 per cent of the IT budget (in terms of IT assets, leases, staff and management of delivery of IT services) when IT functions transfer to third-party vendors. They also noted that 30 per cent of such ventures fail to meet the desired outcome, and that 25 per cent of these partnerships create no cost savings for the firm investing in them.

In early 1990, the internal development team of the Malaysian National Electricity Board (now known as Tenaga Nasional Berhad (TNB)) developed a successful in-house billing system. Designing in-house applications allows organisations to increase their experience and expertise over time, with internal development teams becoming knowledgeable in the whole process of system development life cycle tasks, including project planning, analysis, design, implementation, testing, maintenance, monitoring and support processes.

However, in the case of Human Resource Management Information System (HRMIS), a sudden decision was made by the organisation to terminate the contract of the outsource vendor, leaving the internal development team unable to develop and maintain the system due to a lack of capability. The internal IT staff had not been given any experience in system development by the outsource vendor, and were unaware of the whole process of the system development life cycle, and instead were equipped only to monitor the existing systems, leaving them fully dependent on the vendor for system development and maintenance.

The HRMIS project is a Malaysian government initiative to ensure that human resource management in the public service produces skilled, trained and motivated workers. The HRMIS is now being implemented throughout the Malaysian public

service with a total of 1.6 million civil servants (Woo, 2014). Among the main features of the HRMIS are that it is process-driven, it provides for self-service facilities and it is web-based. The application allows all civil servants to update their personal records and to apply for the various available service benefits such as leave, travel claims and training courses. In addition, the data of HRMIS public sector human resource processes stored in a centralised database will facilitate analysis and strategic planning of human resource, at either the department, ministry, state or national levels (JPA, 2011).

The sudden decision to insource the HRMIS was a major challenge to the organisation, especially to the internal IT staff now responsible for supporting the system. The quality of IT systems was poor, and when the system was not functioning correctly, there were multiple problems, including slow response times, missing data, the system could often not be accessed, and the content of system was not up to date; leading the organisation and its users to rely on manual approaches in order to manage their daily operations. Such challenges motivated the researcher to explore the implementation of insourcing a government information system after the termination of an outsource vendor's contract.

Whilst the development of in-house IS started in the 1980s when organisations operated their own IS environments (Lee et al., 2003), current insourcing practise is different, because systems can often be accessed by the users around the world, and usually involve highly complex technology, including network management and telecommunications; when compared to the systems in place in the 1980s that used the standard application package concept, with organisations buying standard equipment, systems and application software, and assembling them into an infrastructure unique to each organisation (Lee et al., 2003). In the intervening years, the demand for IT applications has increased tremendously, and an inadequate supply of skills and experience from IT personnel has led to widespread difficulties in implementing successful insourcing.

By implementing insourcing in government IS, an organisation can improve the quality of public services and reduce government expenditure on system development and maintenance, as existing staff manage the information systems.

It also can enhance the technical skills and knowledge among IT staff in the public sector. However, existing research has to date focused more on outsourcing in countries such as the UK and the USA (Alsudairi & Dwivedi, 2010, Gonzalez et al., 2006) ; and therefore, there are a number of issues surrounding the insourcing of IS that need to be explored in order to evaluate the suitability of this approach in public organisations.

Insourcing IS in public organisations can arguably be viewed as a new approach in systems development and maintenance, as it is still in its infancy; with the vast majority of studies in this areas focusing on private organisations (Reynolds & Seddon, 2010; Moe et al., 2014; Moe et al., 2012; Hirschheim & Lacity, 2006; Hirschheim & Lacity, 2000). It seems apparent that public organisations would benefit from a paradigmatic shift in terms of their systems development and maintenance processes. Therefore, based on this potential to study the insourcing of an IS, the researcher was interested in finding out more about how the insourcing of an IS could be successfully implemented and make a positive impact on a public organisation in a developing country, especially following the termination of the contract with the outsourcing vendor.

Walsham & Sahay (2006) assert that future research on Information and Communication Technologies (ICTs) in developing countries needs to cover a wider range of geographical localities; and that research should also have a greater focus on scalability and sustainability, with more in-depth research on specific technologies and society-based criticism. In addition, Avgerou (2008) found that there are many IS interventions in developing countries, which could be improved by engaging with current research literature. Whilst the prediction of the potential benefits of insourcing a government IS might be simple, it is necessary to critically analyse and evaluate the issues that may affect its implementation. The readiness of key stakeholders, such as the government and senior managers to insource an IS must to be considered, given their position as major contributors and decision makers in ensuring that resources (such as budgets, training and staff) can be provided. This reveals how the process of system development and maintenance before an IS can be insourced faces challenges, and explains why not all such endeavours have been successful.

This research starts by exploring and identifying the key factors that enable or inhibit the insourcing of a government IS after the termination of the contract with an outsourcing vendor. This research also introduces a framework to analyse and evaluate the technology, and to further determine its wider implications to the research and practise of IS. In doing so, it will provide a valuable and unique perspective to the challenges faced in the process of systems development and maintenance undertaken by governments. It will also contribute to the development of research and practise in system development and maintenance.

This research identifies and analyses the enablers and inhibiters that may influence the decision to insource an IS, and their effect on subsequent implementation by using an analytical framework to maximise selected development impact factors. By exploring the insourcing of a government IS, the research outlines expectations for how public organisations could save on government expenditure, enhance the skills and knowledge of internal IT staff, and improve the adoption of technology to access systems to reach important conclusions regarding the future of insourcing of government IS.

## 1.1 RESEARCH AIMS

The aim of this research is to explore the impact of insourcing a large government IS in Malaysia. To achieve this aim, the following research questions have been posed:

a) How can we determine the enabling and inhibiting factors of insourcing an IS in a public organisation[1]?
b) What are the factors that influence the success of insourced government ICT projects?
c) To what extent does insourcing a government IS have an impact on the public organisation?

[1] The terms "insourcing an IS in a public organisation", "insourced government ICT projects" and "insourcing a government IS" will be used interchangeably throughout this thesis and refer to the same context.

## 1.2 RESEARCH CONTRIBUTIONS

There are several outcomes resulting from this research. Firstly, this is the first and largest empirical study to explore and identify the enabling and inhibiting factors of insourcing a government IS in a developing country, using 69 interviews with the organisation concerned. This is achieved by applying the analytical framework described in more detail in Chapter Three.

There are also research contributions in the area of capacity building of the internal development team. The capacity building of the internal development team is an important element in the implementation of insourcing a government IS because the ongoing system maintenance and support will be managed by internal IT staff, and therefore, the system must be capable of being upgraded and expanded without any involvement from a third party or vendor. When successful, this will lead the organisation to being able to use advanced technology to access the system in order to improve system accessibility, utility and usability. This study found that insourcing boosted the development of an online web portal that provides services to government employees. After the termination of the outsourcing vendor contract, the number of HRMIS users has increased from 470,000 to nearly 650,000 civil servants in Malaysia (Woo, 2014). This was made possible because the internal development team developed a new web portal supporting Internet Explorer (IE), Mozilla, Safari, and Google Chrome browsers and mobile applications on the Android and iOS platforms.

By controlling the whole process of system development and maintenance using the internal development team, the expectations and requirements of users could be met at a lower cost. The outsourcing of IT functions of the Malaysian government had increased government expenditure over time, particularly as the vendor's maintenance contract had expired and the system could no longer be updated.

This study has revealed that insourcing also builds the capabilities (skills) of internal development team members. The technical skills and knowledge of government IT officers has improved not only in ASP, ASP.Net, and MySQL programming but also in JavaScript, PhP, Postgres, Oracle and Open Source

technologies. As a result, the internal development team was able to develop a new version of HRMIS, using JavaScript to enable system access from multiple browsers and client platforms.

## 1.3 LIST OF PUBLICATIONS

As a result of this research, one journal paper was accepted for publication and three conference papers were presented and published. The list of publications is as follows:

a) **Omar, A.**, Bass, J.M., Lowit, P., (2016). Exploring the Factors that Influence the Success of Insourced Government ICT Projects. *The Electronic Journal of Information Systems in Developing Countries,* vol. 77, no. 5, pp. 1 - 22.

b) **Omar, A.**, Bass, J.M. and Lowit, P., (2015). Insourcing a Government Information System: An Analysis using Institutions and the Capability Approach. Information Society (i-Society), 2015 International Conference on Information Society (i-Society 2015), Technical Co-Sponsored by IEE UK/I Computer Chapter, London, United Kingdom. pp. 91 – 96.

c) **Omar, A.**, Bass, J.M., Lowit, P., (2015). Insourcing a Government Information System: A Case Study. 13th International Conference on Social Implications in Developing Countries, Negombo, Sri Lanka. pp. 198 – 210.

d) **Omar, A.**, Bass, J.M., Lowit, P., (2014). A Grounded Theory of Open Government Data: A Case Study in the UK. 18th UKAIS International Conference on Information System, Oxford, United Kingdom.

## 1.4 THESIS STRUCTURE

Chapter Two presents an overview of the literature. Government IS and system development is examined, together with the literature on sourcing an IS. Chapter Two also analyses the literature on sourcing in developed and developing countries, their impacts, and the frameworks used when studying them.

Chapter Three discusses the selection of the analytical framework used for the research, which is then presented and discussed in more detail. A combination of institutional theory, the capabilities approach and OPTIMISM model is adopted as the analytical framework used to explore and evaluate the insourcing of a

government IS. The chapter opens with a description of the institutional theory and its application within the IS field; before moving to discuss the capability approach and its application in the IS domain. The chapter also explains the rationale for choosing these frameworks and theories.

Chapter Four outlines the research perspective and research methods, including the basis for selecting a qualitative research method and a case study approach. This chapter also discusses the data collection methods and the grounded theory coding principles used for data analysis.

Chapter Five presents the empirical findings, and the research outcomes are critically examined. Selected findings have already been accepted for publication in the Electronic Journal of Information System in Developing Countries (EJISDC) and also published and presented in two conferences (Omar et al., 2015a, Omar et al., 2015b).

Chapter Six describes the main contributions of this study, using the enhanced analytical framework based on two series of data collection. This chapter outlines the exciters and inhibitors that influence insourcing of an IS in a public organisation, with exciters and inhibitors identified through the lenses of the institutions and capabilities frameworks. Part of this chapter has been accepted for publication in EJISDC and also published and presented at two conferences (Omar et al., 2015a, Omar et al., 2015b).

Chapter Seven summarises the thesis and discusses its contributions to theory and practice, as well as its limitations. There are also recommendations and suggestions for future work.

# CHAPTER 2: LITERATURE REVIEW

## 2. INTRODUCTION

As outlined in Chapter One, the aim of this research is to explore and identify the enabling and inhibiting factors when insourcing a government IS after the contract with an outsourcing vendor has been terminated. This chapter provides background on this topic and highlights the gaps in existing knowledge that this research aims to fill.

This chapter will describe the success factors for IT implementation, barriers to IT implementation, government ISs, IS in developing countries, IS procurement and the analytical theories and frameworks that have been used in the sourcing implementation literature.

## 2.1 SUCCESS FACTORS FOR IT IMPLEMENTATION

The measure of success in ICT projects has been interpreted in a number of different ways. For instance, Leesa et al. (2012), Bass & Heeks (2011), and Heeks (2002a) all define the success of ICT projects as being dependent on the size of the gap that exists between current realities and the design of the ICT project, with the consensus being that an ICT project will be successful if the gap between design and reality is small. The OPTIMISM model (Bass & Heeks, 2011) uses eight OPTIMISM dimensions to measure the design-reality gap of an ICT project: (i) objectives and values (both formal strategies and culture and informal goals); (ii) processes (from individual tasks up to broader business processes); (iii) technology (not just ICTs but also other relevant technologies); (iv) information (data stores, data flows, etc.); (v) management systems and structures; (vi) investment resources (particularly time and money); (vii) staffing and skills (both the quantitative and qualitative aspects of competencies); and (viii) milieu (the external political, economic, socio-cultural, technological and legal environment). The design-reality gap is used to measure the design expectations of any organisational change against a real situation that may match or mismatch in the context of implementation.

Every IS is comprised of people, processes, structure and information technology, which need to fit in order to increase the level of IS success. These factors need to interact with each other, with which factor the organisation needs for one or more different dimensions or factors to be brought into congruence at the same time shown in Figure 2.1. This model is called dimensional contingency and was developed by Leavitt (1965) to illustrate that the success of IS becomes higher if there is congruence between factors; and the greater the lack of fit between factors, the higher the risk of failure.

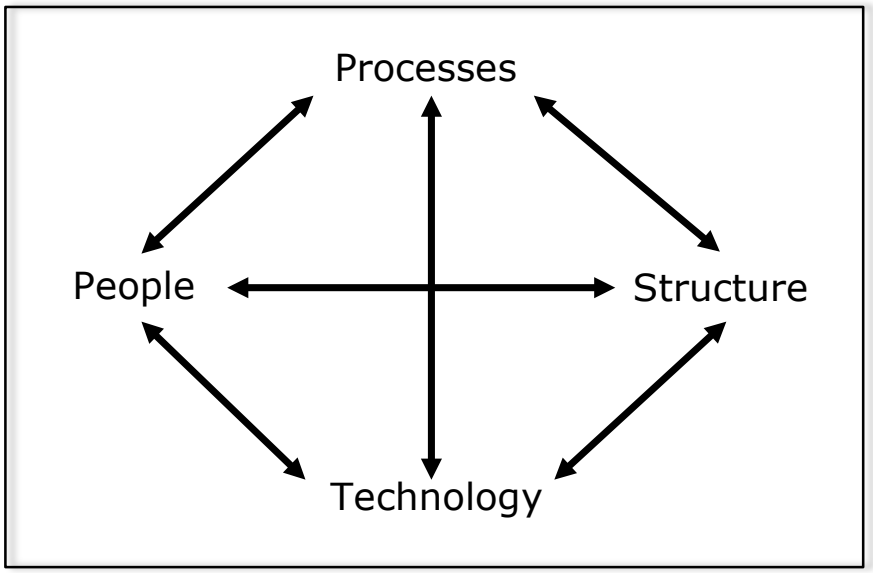


Figure 2.1: Dimensional contingency (Source: Leavitt, 1965)

However, this dimensional contingency is a relatively poor conception of organisational change. Organisational change is important because it can influence the successful of the IS project, with the risk of failure higher when the degree of organisational change is higher. By combining organisational change and temporal fit, a systemic view of technology can be provided, as summarised in Figure 2.2. In this figure it is possible to see the match between current and future systems, where the greater the match, the greater likelihood of success of the system, and conversely if the mismatch as linked is greater, then the greater risk the system will fail.

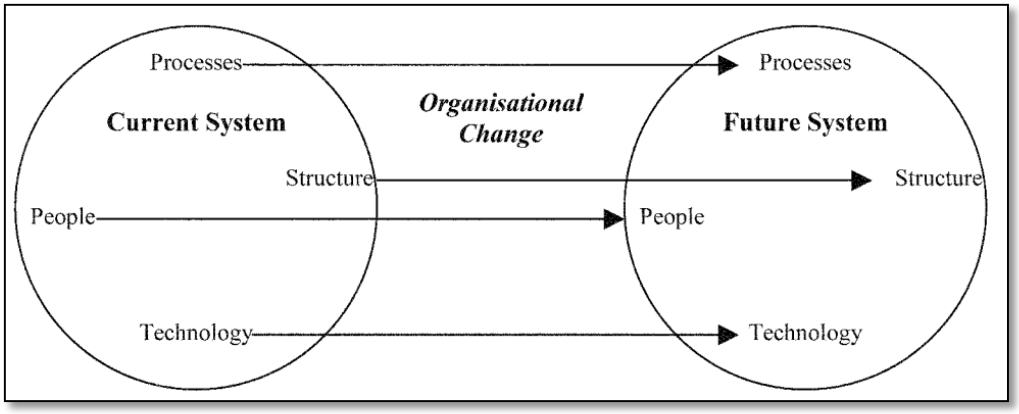


Figure 2.2: Temporal, systemic contingency (Source: Heeks, 2002a)

When following a temporal, systemic contingency analysis, it is easy to assess the current reality, but to predict the future, it is necessary to assess the future system as represented in the design for the system. In recognition of this, the seven dimensions of design-reality gap, known as ITPOSMO, was introduced by Heeks (2002a) (shown in Figure 2.3). The ITPOSMO evaluates and assesses both the current and future systems, because expectations regarding the future are highly subjective, with every individual IS stakeholder likely to have their own ideal design and subsequent version of actuality. Thus, the design-reality gap can assess and measure the gap between system design and reality for each dimension, in which the gap can be identified as low, medium or high. The bigger the gap between design and reality, the greater the risk of failure; with the smaller the gap between them, the greater the chance of success of the project.

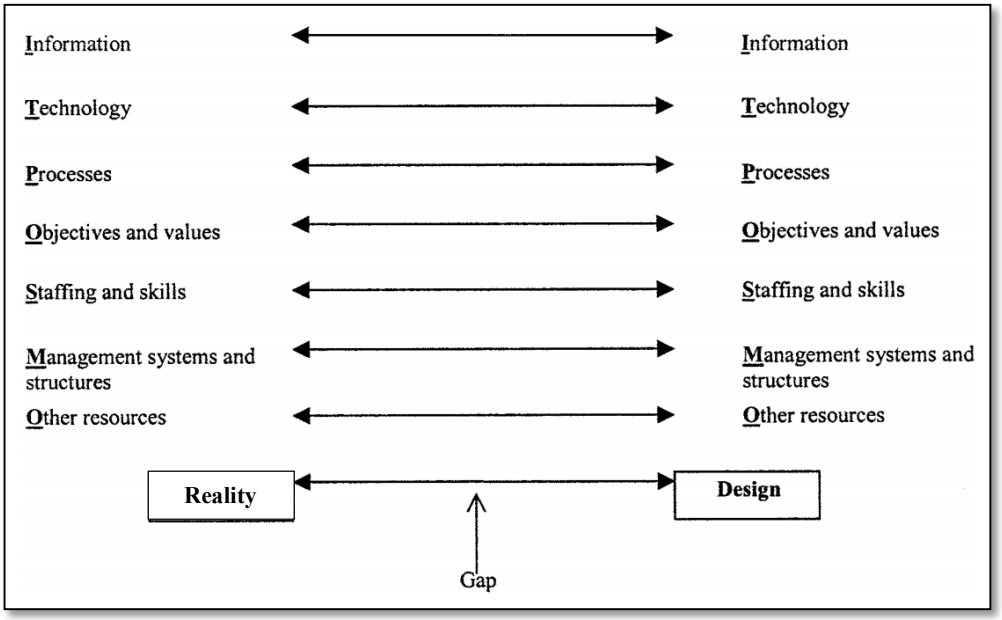


Figure 2.3: Design-reality gap (Source: Heeks, 2002a)

The successful implementation of IS means that the system provides the intended solution for the user(s), with the most appropriate documentation, is the most economical to run, the most adaptable, makes the best use of the techniques and tools available and is liked by its stakeholders (Avison & Fitzgerald, 2008) . According to Thomas & Fernández (2008), IT projects with a clear definition of the project's requirements, that consistently measure success and fully utilise project resources have a greater chance of achieving success. Stacie et al. (2008) describe six attributes of successful IS: (i) system quality (ease of use, system flexibility, system reliability, and ease of learning); (ii) information quality (relevance of information, understandability, accuracy, completeness, and usability of information); (iii) service quality (responsiveness, accuracy, and technical competence from staff); (iv) system use (the amount of use, frequency of use, extent of use, and purpose of use); (v) user satisfaction (level of satisfaction from the user for the IS); and (vi) net benefits (improved decision making, improved productivity, and greater efficiency).

The successful implementation of ICT projects also depends on the driving factors, which are specified by Gichoya (2005) as being vision and strategy; government support; external presure and donor support; rising consumer expectations; technological change; and modernisation and globalisation. Furthermore,

according to Yeoh and Koronoios (2010), system stability, ease of use, functionality, flexibility and good response times are critical factors in the successful implementation of an IT project, leading to a system that can generate accurate, timely, complete, consistent, and relevant information for the user. They added that an IT project completed on time and within budget could also contribute to successful IT project implementation. In addition, support from senior management, effective change management and business process management are also proposed as having a positive impact on successful IT project implementation (Žabjek et al., 2009).

It is therefore clear from the literature that there are many factors that affect whether an IT project is implemented successfully, as summarised in Figure 2.4.

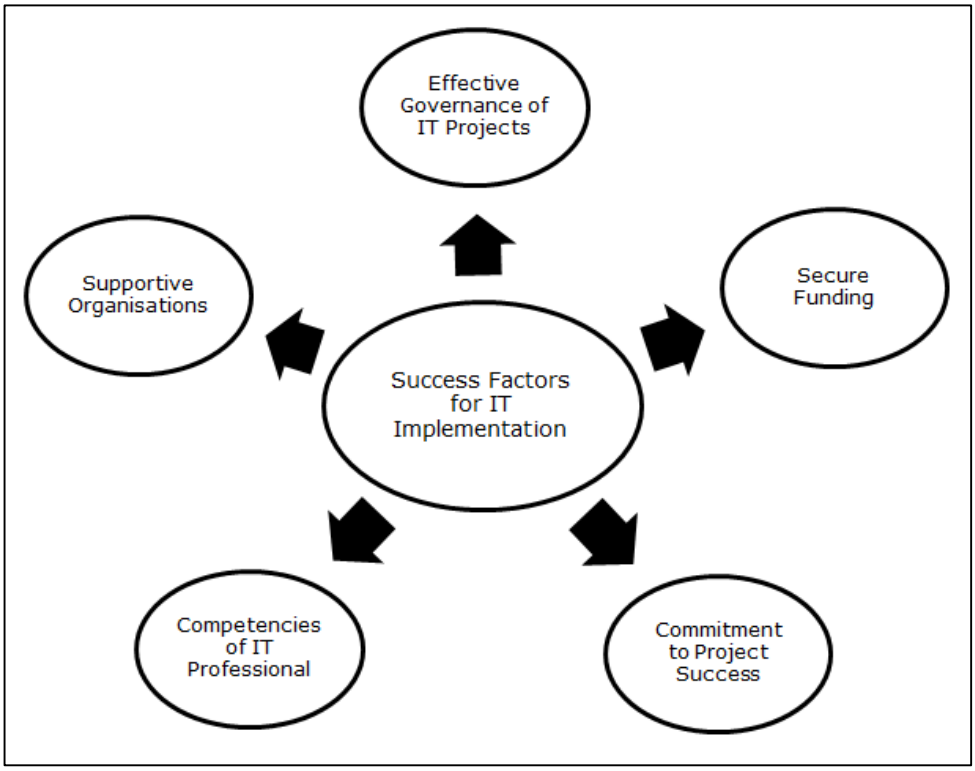


Figure 2.4: Success Factors for IT Implementation

However, the successful of IT implementation depends on how these factors are managed, as every organisation has a different structure, culture and operating environment; and therefore the barriers to IT implementation also need to be explored as they can equally affect the operation and management of IT project.

## 2.2 BARRIERS TO IT IMPLEMENTATION

According to Heeks (2003), most ICT projects in developing countries are subject to failure, especially e-government systems. These failures can be divided into two groups: total failure (where the initiative was never implemented or was implemented but immediately abandoned); or partial failure (where the major goals for the initiative were not attained and/or there were significant undesirable outcomes). Heeks determines that 35 per cent of the projects are total failures and 50 per cent are partial failures. Whilst most governments, particularly those in developing countries, have made enormous investments in their ICT projects in order to improve their delivery systems, expenditure keeps rising annually.

IS projects in developing countries may fail to be completed, a new project may not be used, or may fail to produce the expected results due to failures in scalability, sustainability, or an assimilation into dysfunctional organisational processes (Avgerou, 2008). IS failure has also been defined as projects that have been abandoned, or those that fail due to excessive time and cost; or those whose systems do not fulfil users' requirements or project objectives (Mat Nayan et al., 2010). In the public sector, the success or failure of an ICT project is most affected by the attitudes of senior managers. It is also crucial that IT managers in the public sector (those responsible for government IS) understand the differences between the private and public sectors (Moon et al., 2007). This is supported by work undertaken by Wright & Capps (2010), who found that most large IS projects, whether in government or private industry will exceed their original budgets and timelines by more than 50 per cent, as the decision making in the project is heavily influenced by the senior management of the organisation.

Charette (2005) adds that the most common factors contributing to the failure of software projects are unrealistic or poorly articulated project goals; poorly defined system requirements; poor communication among users, developers and customers; and the use of immature technology. Most failures occurring in software projects are due to a combination of technical, project management and business decisions. Verner & Evanco also highlight that many projects start (and continue) with unclear requirements, which can affect the estimation process, leading to schedule and cost underestimates and inadequate staffing; and staffing

itself then becomes a major risk factor. Ahmad Nawi et al. (2012) also suggest that failure by government agencies and authorities is also often related to poor project management, including lax project planning and estimation, project evaluation, selection and monitoring processes and project risk management that can all lead to project failure. Ahmad & Othman (2007) assert that barriers impeding the development of IT projects include legislative, regulatory and budgetary frameworks; technological deficits; and the digital divide. In addition, organisational and political complexities also contribute to the failure in the implementation of IT projects, particularly in the public sector, because the functions of public organisations operate within a completely different set of parameters to private business (Gauld, 2007).

From this analysis, it can be concluded that there are many barriers that hinder the successful implementation of IT projects, as illustrated in Figure 2.5.

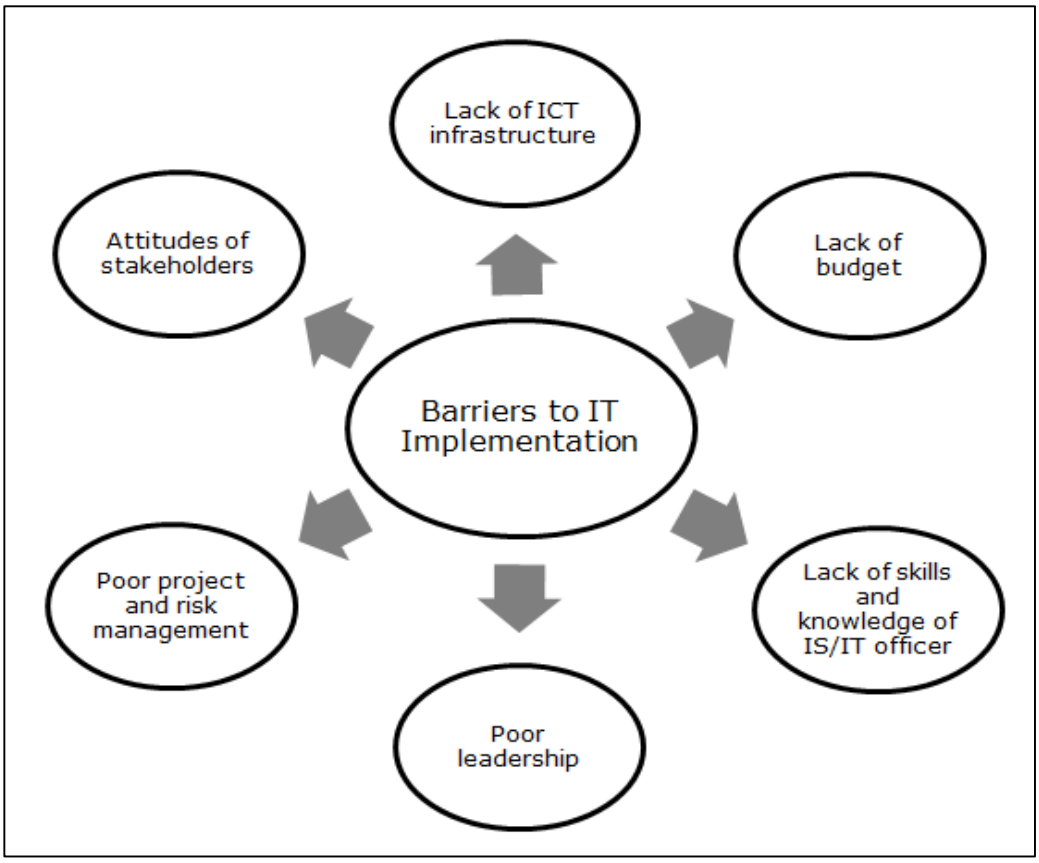


Figure 2.5: Barriers to IT Implementation

It is therefore clear that the key factors determining success and the barriers to IT implementation in a public organisation (government IS) depend on aspects related to the design, implementation and management of IT projects.

## 2.3 GOVERNMENT INFORMATION SYSTEMS

Government information systems are by their very nature large and complex. They provide services to civil servants that are designed to enhance the access, transparency, efficiency and quality of public administration, playing an important role in ensuring that the organisation delivers the information and communication services needed by civil servants (Bekkers & Homburg, 2007; Sundgren, 2005).

A government IS should not be confused with an e-Government or commercial information or enterprise system. Kalvet (2012) defines e-Government as:

> *The use of information and communication technologies in public administration, combined with organisational change and new skills, to improve public services and democratic processes and to strengthen support for public policies (pg 142).*

The definition of e-government provided by Dada (2006) is:

> *e-government is not merely the computerisation of a government system, but a belief in the ability of technology to achieve high levels of improvement in various areas of government, thus transforming the nature of politics and the relations between governments and citizens (pg 1).*

Strong & Volkoff (2010) define commercial information or enterprise systems as:

> *one class of packaged software applications, are large integrated, process-oriented packages designed to meet most needs of organisations including accounting and control, manufacturing and distribution, sales and order entry, human resources, and management reporting (pg 731).*

Drawing on these definitions, it was decided that for the purposes of this research, a government information system is not part of an e-government system nor a commercial IS or enterprise system, because a government IS is not public facing, and provides a system solely for the use of government employees working in a specified environment, and does not involve with any business transactions.

When managing its systems development and implementation, an organisation should have policies and regulations in place to ensure that the implementation of IT can be both effective and smooth. Harindranath (2008) made the case that governments should have a policy framework to nurture the ICT industry and ICT diffusion and use, with the aim of creating and building technological capability, and to allow for the better exploitation of ICT for development and economic growth. Gupta et al. (2008) add that the design of ICT in government systems should encourage ease of use, and impact positively on individual and organisational performance – improving performance by making changes within public sector organisations (Heeks, 2002b). The development and implementation of government ISs brings changes to governments' organisational structures and functions, ideally leading to improvements in service delivery to the public, and enabling the integration of all services in national, state and local governments (Chen et al. 2006). Stea & Harindranath (2006) also believe that public organisations must implement ICT strategic management that is conducive to a networked environment setting up an ICT-enabled agency, while strategic IS need to be similar to those found in the private sector because the nature of IS itself requires the adoption of a more advanced form of ICT strategy.

In the process of system development and maintenance, IS expertise is an important element in ensuring that the IS can be developed within the time frame and budget allocated. According to Othman & Rahmat (2005), IT officers must have very high competency levels and be committed to the project concerned at its inception, as projects may often be cancelled due to a lack of experienced people when the project team is selected (Ahonen & Savolainen, 2010). The skills that are critical for the organisation of IS projects are: (i) IT architecture and standards; (ii) system design; (iii) systems analysis; (iv) business skills and capabilities; and (v) programming skills (Goles et al., 2008; Zwieg et al., 2006). However, recent trends towards global sourcing mean that IT professionals are now expected to have less technically oriented skills than they were ten years ago, and most organisations now emphasise different skills requirements from new recruits or outside bodies than when providing the same services internally (Hawk et al., 2012). Consequently, organisations should upgrade the technical skills and knowledge of their own internal IS/IT staff to ensure that they have the adequate

and up-to-date knowledge and skills necessary to enable the organisation to reduce its dependency on vendors.

## 2.4 INFORMATION SYSTEM IN DEVELOPING COUNTRIES

Walsham & Sahay (2006) assert that the research in IS that has been carried out thus far is reasonably extensive. However, this study argues that its coverage is greater in the English-speaking world and in OECD countries than it is in developing countries, and that there is a strong case for the greater involvement of developing countries, particularly using indigenous and local researchers. Avgerou (2008) believes that developing countries can contribute a great deal to IS research, by engaging with on-going research into the study of IS innovation. However, whilst the literature on ICTs in developing countries is undoubtedly growing, there remains a paucity in the number of studies that address the meaning of development (Walsham, 2010). In an effort to address this gap, this study draws upon four broad development categories designed to achieve specific development goals in developing countries, as illustrated in Table 2.1.

| Broad Development Category | ICT-based Initiatives | Specific Development Goal |
|---|---|---|
| Better lives for the poor | • Health information systems<br>• Telecentres<br>• Mobile phones | • Improved health care<br>• Access to information for better freedom of choice<br>• Better economic and social opportunities |
| Improved government services | • Computerised back-end administrative systems<br>• E-government direct services<br>• Use of Geographical Information System (GIS) | • More efficient services to citizens<br>• Visible direct services<br>• Better planning and implementation of infrastructure |
| Enhanced internal economic activity | • Internet banking and ecommerce<br>• Adoption of ICTs in private sector companies<br>• ICT in agricultural supply chains | • Better financial services to citizens and businesses<br>• More efficient enterprises<br>• Improved efficiency in the key sector of agriculture |
| Improved civil society | • Computerised records in land reform<br>• Empowering slum dwellers and other local communities through information and ICTs<br>• Provision of broader information on civil society | • Increased efficiency and reduced corruption<br>• Improved social and political participation of disadvantaged groups<br>• Information as means to affect negative attitudes such as apathy and indifference |

Table 2.1: Framework for Analysis of ICT-based Development Initiatives (Source: Walsham, 2010)

Studies of ICT in developing countries have placed a greater emphasis on cultural implications and the local adaptation of ICT design, implementation and use (Walsham & Sahay, 2006) , and found that there is a great deal of potential for ICTs to improve in various sectors in developing countries such as healthcare, education and business. According to Andoh-Baidoo (2016), there are two main research areas for ICT in developing countries: (1) technology for development; and (2) understanding technology in developing economies. However, according to Heeks (2002a), using IT investment as an indicator (with approximately 80 per cent gross return for OECD countries), there is a difference in determining the success and failure rate of IS/ICT implementation between developing and OECD countries. One of the main reasons proposed for the failure of ICT projects in developing countries is an inability to apply and activate technologies deployed

from industrialized countries without considering the reality of the local context, revealing that the success or failure of IS/ICT project implementation in developing countries also depends heavily on the physical, social and political context.

## 2.5 INFORMATION SYSTEM PROCUREMENT

This study focuses on IS procurement: the core aspect of the IS field responsible for ensuring that high quality IS projects can be delivered on time and within budget. IS procurement is a common way of acquiring IS to ensure the continuity of the system development process.

Information systems are developed by either an internal development team or by an external vendor. However, developing a complete system is a highly complex process. According to Ahmad Nawi et al. (2012), there are three types of ICT project development and implementation: insourcing (using internal personnel and experts); outsourcing (relying on external services); and co-sourcing (employing external services with an internal expert). However, outsourcing is traditionally the preferred approach because it can reduce both costs and the risks related to business and technology, allowing the organisation to focus on its core capabilities and business (Lacity et al., 2011a; Lacity et al., 2010; Ahonen et al., 2009; Dibbern et al., 2004). The term 'sourcing' in IS refers to: (1) who provides the IS services; (2) what IS services are provided; and (3) where these services are provided (Hirschheim & Lacity, 2006). Drawing on studies carried out by Moe et al. (2012) and Moe et al. (2014), there appear to be four types of sourcing arrangements: onshore outsourcing, offshore outsourcing, onshore insourcing and offshore insourcing, as shown in Figure 2.6. This research focuses on onshore insourcing. Onshore insourcing is the implementation of insourcing in the same organisation within the same country, as will be explained in more detail below.

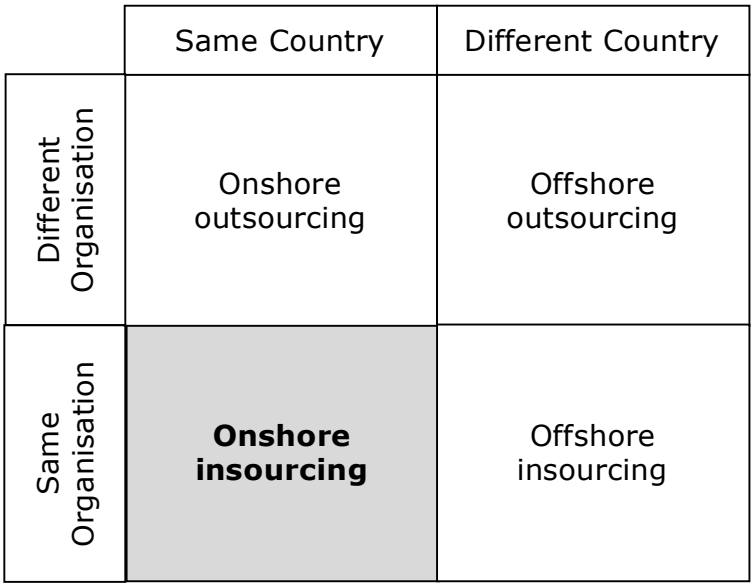


Figure 2.6: Types of Sourcing Arrangement (Source: Moe et al., 2012 and Moe et al., 2014)

### 2.5.1 Outsourcing

Outsourcing is commonly defined as "the appointment of a third party service provider or a vendor to perform and complete a task for management within a specified length of time" (Oshri et al., 2009; pp. 4). According to Lacity & Willcocks (1998) and Jain Palvia (2004), IS outsourcing functions include application development and maintenance (including acquisition and maintenance of IT infrastructure: hardware, systems software, telecommunications networks); system operation; network/telecommunications management; end-user computing support; systems planning and management; and the purchase of application software. Most companies that have successful IT outsourcing relationships use a reasoned, incremental and selective approach, which is increasingly reflected in the market structure (Lacity et al., 2012). However, outsourcing can also be complicated, carrying huge risks that may increase project costs, devalue software quality, delay project completion time and lower the success rate of the outsourcing project if such risks are not managed effectively (Chou & Chou, 2009) .

The key success factor for IT outsourcing is for companies to outsource procedures and processes that are not operating effectively in-house. The most common

reasons given for IT outsourcing are headcount reduction, a lack of internal expertise, a desire to employ emerging technologies, network outsourcing, Enterprise Resource Planning (ERP) applications, generating a web presence, undergoing business transformation or a change in business strategies, disaster recovery/business continuity planning and internal political issues (Milligan & Hutcheson, 2006). Using four outsourcing solutions, Freytag et al. (2012) have developed a framework designed to improve understanding of the different issues to be considered when evaluating different outsourcing solutions, allowing the different risk factors to be addressed. The four different outsourcing solutions proposed by the framework are: maintaining the original outsourcing partner, finding a new outsourcing partner, backsourcing to own business and establishment of a new firm.

The IT outsourcing relationship between the customer and vendor is also an important element when ensuring that the process of IT outsourcing is carried out smoothly. According to Platz & Temponi (2007), the key elements of the outsourcing contract are performance, financial, human resources and legal functions. However, the existence of the outsourcing contract is not in itself enough to cement customer-vendor relationships. The contract must be specifically designed to meet the needs and goals of the contract, and to reflect the involvement, specific nature and respective industries of the organisations concerned. Kern & Willcocks (2002) highlight that the relationship between the customer and vendor can by analysed using the interaction approach to understand the IT outsourcing relationship in practise. The interaction approach can help the organisation to understand how institutionalisation and adaptation occurs and to gain an appreciation of external impact factors on the operation of outsourcing relationships, the exchange characteristics, how the atmosphere between the vendor and client may evolve over time, and the impact of various behaviours upon the relationship.

### 2.5.2 Co-sourcing

According to Tsai et al. (2010), co-sourcing can be defined as a close partnership between an organisation and outsource vendor to provide a comprehensive

solution for the IT department for a particular strategic area. It also leads to operational efficiencies, as it enables the organisation to save money, time and resources. Borman (2006) defines co-sourcing as putting together internal staff and an external vendor toward achieving one common goal.

From the perspective of the outsourcing vendor, co-sourcing is a far less preferable arrangement, as it gives them less power in the relationship. However, such an arrangement often allows clients to share coordination costs with other companies, because the vendor often has many other similar relationships (Jayatilaka, 2006). In addition, in co-sourcing arrangements and relationships, the client and vendor share the risk and reward, which is not an economy of scale and is not a particularly strategic approach for the organisation to take. Nevertheless, co-sourcing may increase the competencies of the client's IT staff, with the client's IT needs fulfilled by the vendor (Hirschheim & Dibbern, 2006). However, even though co-sourcing may enhance the competencies of an IT officer, and allows the client to retain greater control over the relationship and arrangements with the vendor, this study argues that insourcing is the best option to be implemented by the majority of public organisations, because the co-sourcing relationship between customer and vendor needs to be further refined, with a public-private partnership (PPP) possibly more feasible than co-sourcing.

## 2.6 INSOURCING

There is no one standard definition of 'insourcing', which generally refers to the use of internal resources to perform tasks or work in an organisation. According to Schniederjans et al. (2005), insourcing is using internal sourcing of business activities by allocating or re-allocating resources internally within the organisation. Sikula Sr et al. (2010) define insourcing as "when an organisation uses especially internal labour and personnel, but other resources as well, to supply the operational needs of its enterprise" (pp 3). The definition of insourcing is similar to that of backsourcing, which Veltri et al. (2008) describe as when:

> *A company takes back in-house assets, activities, and skills that are part of its information systems operations and were previously outsourced to one or more outside IS providers* (pp 51).

Whitten & Leidner (2006) previously defined backsourcing as "*the practice of bringing information technology (IT) back in house following an outsourcing arrangement*" (pp 606).

To avoid confusion, the term 'insourcing'[2] in this research refers to the process of returning the functionality of IS development and maintenance from a vendor to an organisation by using internal resources after the termination of a vendor contract.

The decision to backsource may be made due to dissatisfaction with the IT outsourcing experience, particularly if problems have arisen during the contract; or a desire to regain control. Other reasons for insourcing and the termination of IT outsourcing contracts include changes in the technology, management and business environments, business change and evolution; with the main reasons for insourcing being to regain control and flexibility, recognition of information system's role in the organisation, and a change of management (McLaughlin & Peppard, 2006).

Falaleeva (2003) states that the customer cannot rely on the vendor due to the possibility that the vendor may be unable to successfully complete their contract, and therefore, the decision to insource the IS is motivated by the opportunity to save both money and time. It is clear that an organisation needs to regularly review the IT outsourcing contract in order to ensure that they have a comparative cost advantage in both agency costs (the costs of structuring, monitoring and bonding a set of contract) and transaction costs (the effort, time and costs incurred in searching, creating, negotiating, monitoring and enforcing a service contract), as higher maintenance costs play an important role in the decision to backsource the IS. Technology and volume uncertainty due to technological changes, along with fluctuations in supply and can provide the reason to backsource the IS, as can the performance of the vendor, especially if it is of poor quality, inadequate or hard to measure. Similarly, a mismatch in the goals of the client and vendor may

2 The terms 'insourcing' or and 'backsourcing' refer to the same concept and will be used interchangeably throughout this thesis.

result in the termination of the contract, particularly if the interests of the vendor are no longer aligned with the client.

Kotlarsky & Bognar (2012) have revealed that insourcing in an organisation is often difficult to implement, due to a lack of organisation skills and staff numbers. With a sizable pool of skilled and experienced external specialists available in the labour market, particularly in India, China and Malaysia, these countries are key locations for IT outsourcing, as labour costs are low. These countries have a good supply of skilled and experienced workers, especially in ICTs. ICTs play a major role in insourcing of IS and are key to ensuring that the ISs can be delivered on time and within budget, as discussed in the next section.

### 2.6.1 ICT and Insourcing

ICTs are crucial to the development of IS in an organisation. ICTs are also a key tool for policymakers seeking to improve an organisation's management and to make decisions, not only in the ICT sector, but also in other areas, such as public administration, healthcare, education and business (UNESCAP, 2016). According to TechTarget (2016), the term ICT refers to:

> "A*ny communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries*" (pp 1).

With rapid changes in technology now commonplace, it is possible for an IS to be accessed via multiple platforms, including mobile applications, tablets, PCs and laptops. As the contribution of ICTs to development is constantly changing, new impact assessments are constantly needed (Heeks, 2010). However, despite this requirement, the development of ICTs in developing countries is typically focused on the capacity to export software products and services, rather than on the contribution that ICTs can make to domestic IS innovation (Avgerou, 2008).

It can therefore be concluded that ICTs are an effective mechanism for the transformation of government services and to meet the demands of stakeholders

and the wider public. ICTs also play an important role in the development, implementation, and maintenance of government ISs.

### 2.6.2 Insourcing Implementation

Insourcing of government information systems is a relatively new approach in the development and maintenance of systems, and can have a positive impact on an organisation in the longer term when compared with IT outsourcing (Park & Kim, 2005). However, there has been limited research conducted on insourcing, as most researchers remain focused on outsourcing, particularly in OECD countries (Alsudairi & Dwivedi, 2010; Gonzalez et al., 2006).

According to Whitten et al. (2010), the cost of insourcing is higher than outsourcing, because insourcing involves an investment in time, money, and effort in order to develop new skills and knowledge from internal staff in relation to procedures, policies and techniques. As a consequence, most organisations prefer to outsource their IS functionality to a vendor, because it can reduce costs (Lacity et al., 2011a; Lacity et al., 2010; Dibbern et al., 2004). According to Gantman (2011), outsourcing reduces the costs of IS development and maintenance in public organisations. Despite this, Lacity & Hirschheim (2012) found that insourcing may help some organisations reduce their costs by 45 per cent due to software standardisation; 20 per cent as a result of reorganising the IT department and reducing staff numbers; and 43 per cent through consolidating three data centres into one.

Therefore, the main reasons for insourcing are cost savings, improving the quality of relationships, increasing both product and service quality, and the lack of relational quality (Veltri et al., 2008; Kotlarsky & Bognar, 2012; Butler et al., 2011, Solli-Sæther & Gottschalk, 2015). Furthermore, the implementation of insourcing is often undertaken in order to correct problems arising from outsourcing - problems that cannot be resolved in negotiations with the vendor; or to take advantage of new opportunities that will change the internal organisational structure, internal and external environment and which need the support of strong internal IT capabilities (Wong, 2008).

Bhagwatwar et al. (2011) state that the decision to insource is critical, as it will affect the daily operation of the organisation. Therefore, in the process of insourcing an information system, knowledge transfer play a vital role to ensure that both the explicit knowledge (business domain) and implicit knowledge (organisational domain) from the vendor is gathered and applied by the client. As the process of knowledge transfer is complex, the organisation should identify strategic options for successful insourcing decision, including (i) informing the backsourcing/insourcing decision to the outsourcing vendor; (ii) financial viability analysis through audits; (iii) a clear insourcing project team and plan; (iv) transparent workforce requirements and responsibilities during the insourcing process; (v) employee re-hiring and new employee hiring strategies; (vi) security policies; (vii) continuity of business operations; (viii) stakeholder management; and (ix) knowledge management.

As discussed above, Avgerou (2008) has found that most research on outsourcing has been conducted in OECD countries, as most organisations in developing countries rely heavily on IS outsourcing, as there is a lack of IS expertise in-house and often in-country. Both Alsudairi & Dwivedi (2010) and Gonzalez et al. (2006) have shown that the USA and the UK are the countries where the most research on IS/IT outsourcing has occurred.

For the purposes of this study, an extensive search was performed using the databases available at the Robert Gordon University Library to compare the implementation of insourcing with the previous studies have been conducted. The databases interrogated for this purpose were Science Direct (Elsevier), the Electronic Journal of IS for Developing Countries (EJISDC), the European Journal of Information Systems (EJIS), Spring Link, ACM Digital Library, The Institute of Electrical and Electronics Engineers (IEEE) and Journal Storage (JSTOR). Each contains all the major research periodicals in IS-related fields. An additional search was run on Google Scholar, using the keywords 'insourcing', 'backsourcing', 'public sector' and 'government information system' in all searches. A subsequent search, using the terms 'in-house development', 'government agencies' and 'public organisation' did not generate any additional results. Although the database search

engines returned hundreds of publications, only a few fit the inclusion criteria, with the selected publications searched over a fifteen-year period, from January 2000 to September 2015. Only English-language publications were included. Table 2.2 provides a breakdown of the databases and publications interrogated.

| **Database** | **No. of Articles** |
|---|---|
| The DATA BASE for Advances in Information Systems | 1 |
| Journal of Strategic Information Systems | 1 |
| Journal of Information & Management | 1 |
| Information Systems Management | 2 |
| Journal of Information Technology Case and Application Research | 7 |
| Journal of Management Information Systems | 3 |
| Journal of Organizational Computing and Electronic Commerce | 1 |
| Journal of Global Information Technology Management | 2 |
| Journal of Information Systems Outsourcing | 1 |
| IEEE Software | 1 |
| Journal of Strategic Information Systems | 1 |
| The Journal of Systems and Software | 1 |
| California Management Review | 1 |
| Decision Sciences | 1 |
| **TOTAL** | **24** |

Table 2.2: A Breakdown of the Databases

Based on the extensive research undertaken in this area, six studies have been found related to this topic (Moe et al. (2013); Moe et al. (2012); Reynolds & Seddon (2010); Qu et al. (2010); Hirschheim & Lacity (2006); and Whitten & Leidner (2006)), as shown in Table 2.3.

| No. | Authors | Theory / Framework | Method / Techniques |
|---|---|---|---|
| 1. | Moe et al. (2014)<br><br>Four medium-sized Scandinavian software companies in the private sector | Intellectual capital<br>Organisational learning | Qualitative:<br>A semi-structured interview, informal dialogues and analysis of company document. |
| 2. | Moe et al. (2012)<br><br>Three small-scale Scandinavian software development companies in the private sector | Single-loop and Double-loop Learning Theory<br><br>Case studies | Qualitative:<br>Documentation, interviews, direct observation |
| 3. | Reynolds & Seddon (2010)<br><br>A global international gaming and entertainment company | Single case studies | Qualitative method:<br>Semi-structured interviews |
| 4. | Qu et al. (2010)<br><br>500 innovative organisations in InformationWeek 500 reports from the year of 1997 until 2000 | Transaction Costs Economics (TCE) | Quantitative method:<br>Special report |
| 5. | Hirschheim & Lacity (2006)<br><br>Fourteen companies from chemicals, commercial bank, diversified services, food products, petroleum refining, retail, and telecommunications | Story Technique<br><br>Case studies | Qualitative method:<br>Semi-structured interviews |
| 6. | Whitten & Leidner (2006)<br><br>160 responses from various industries such as manufacturing, education, healthcare, and public administration. | A combination of Transaction cost theory (TCT) and social exchange theory (SET) | Quantitative method:<br>A survey |

Table 2.3: Selected Previous Studies on Insourcing

The first study analysed is that of Moe et al. (2014), which studied the relationship between the client and vendor in four medium-sized Scandinavian software companies, operating in the private sector. They found that the termination of outsourcing relationship was often due to the low quality of the developed software, the inability of the companies concerned to improve their offshore relationships, the lack of domain and technical knowledge and communication problems and cultural clashes in human capital among remote developers. Their work suggested that vendors must improve and understand how to work effectively with others in order to solve problems (social capital). They analysed their data to propose solutions about how to improve the relationship between clients and vendors. However, they failed to investigate the overarching enabling and inhibiting factors when insourcing IS in public organisations. Furthermore, their research was conducted in OECD countries, and also neglected to explore and identify the factors that may help an organisation to insource IS.

The second study to be evaluated here is Moe et al. (2012). They examined the relationship between the client and the vendor in the private sector in three small-scale Scandinavian software development companies. The main objective of their research was to recommend ways to improve the relationship between the client and the vendor. They discovered that outsourcing relationships were usually terminated due to issues of low system quality, insufficient domain knowledge, high turnover of staff and a lack of motivation among the developers working for the vendor. They suggest that a company should make an offshoring arrangement that attempts to find a balance between optimizing current processes (single-loop learning) and making fundamental changes (double-loop learning), in order to achieve success. They also discovered that offshore insourcing helped to resolve certain challenges in outsourcing, achieved by exerting control over recruitment, motivation and leadership. However, in common with the Moe et al. (2014) paper, this study did not examine the overall enabling and inhibiting factors for insourcing an IS, and also conducted their study in OECD countries. They also neglected to explore or identify the factors that can help an organisation to insource IS.

The third study assessed is by Reynolds and Seddon (2010), who analysed the implementation of insourcing in a global international gaming and entertainment

company based in Australia. They discovered that insourcing helped the organisation to create new products and to achieve integration with many other systems. They also found that organisations should embed IT as an integral part of their business in order to facilitate the alignment of technology and organisational strategy. They revealed that insourcing creates a pool of strong and loyal employees and that the IT and business risks can be matched in accordance with business demands and inclinations. Although their research helped the organisation concerned reduce their dependency on vendors in relation to system development and maintenance, once again they did not analyse the overall enabling and inhibiting factors of insourcing an IS. Furthermore, their study was undertaken in the private sector in an OECD country.

The fourth study to be assessed was carried out by Qu et al. (2010). Their study was a review of the knowledge sharing operations in 500 innovative organisations in detailed in InformationWeek 500 reports from 1997 until 2000. They used a quantitative method to analyse the performance of the organisations under scrutiny, and found that the development of staff's IT-related resources should be a part of their core competencies, because the coordination of knowledge sharing among internal departments was found to be crucial to the organisation achieving its strategic orientation and objectives through its IT investments. They predicted that the development of IT-enabled business processes (IEBP) could provide a greater strategic value that would improve the performance of the organisation as a result of the implementation of IT insourcing when compared with IT outsourcing. Nevertheless, in common with previous studies, this research did not explore or identify the overall enabling and inhibiting factors in the implementation of insourcing or its impact on public organisations. Furthermore, the research was largely focused on private organisations in OECD countries and not on helping organisations reduce their dependency on vendors in terms of system development and maintenance.

The fifth study to be examined is by Hirschheim and Lacity (2006). They studied 14 companies operating in the fields of chemicals, commercial banking, diversified services, food products, petroleum refining, retail and telecommunications, all in the USA. They studied the perceptions and expectations of stakeholders regarding

IS performance, and how these can affect decision making around IS sourcing. They devised four models of insourcing, asserting that senior executives enable internal IT managers to cut costs; IT managers terminate failing outsourcing contracts; IT managers defend insourcing; and that senior executives confirm the value of IT. They also found that every stakeholder has different expectations and perceptions of IS performance that can affect the outsourcing evaluations. Nevertheless, their study did not focus on the overall enabling and inhibiting factors of insourcing an IS, and their research did not explore the factors that can assist organisations in insourcing IS. Furthermore, their research was conducted in an OECD country – the USA.

The final study to be analysed was undertaken by Whitten & Leidner (2006). Their research considered various industries, analysing the relationship between client and the vendor in a number of OECD countries. Their aim was to help enable organisations to decide whether to insource their systems or change outsourcing vendor. They discovered that the main reasons behind organisations deciding to bring back the functionality of IS from the vendor were the perceived level of trust, commitment, culture and the presence of poor communication between the client and the vendor. They also found that a client is likely to back source or insource the functionality of IS or to change the vendor if the service, relationship or quality of the product decrease. However, their study focused on a private organisation, and they did not explore or identify the overall enabling and inhibiting factors in the implementation of insourcing; and nor did they explore the impact of insourcing with the aim of helping an organisation to continue insourcing.

In summary, the literature review undertaken for this study reveals that previous research has focused more on the situation as it stands in OECD countries and in firms operating in the private sector; and has not investigated or identified the overall enabling and inhibiting factors in the implementation of insourcing an IS in a public organisation. Furthermore, none of the previous studies have examined the implementation of insourcing a government IS after the termination of a vendor contract, or the overall enabling and inhibiting factors, and did not assist the organisations being investigated in reducing dependency on vendors in IS development or maintenance. Therefore, it can be concluded that there is a need

to conduct further research specifically focused on insourcing a government IS in developing countries, which may also further address issues such as IS innovation, as mentioned by Avgerou (2008); and development economics, raised by Walsham and Sahay (2006) as a mechanism to observe the IS/ICT development impact in developing countries.

This research also introduces the development of an analytical framework designed to explore and identify the enabling and inhibiting factors for the implementation of insourcing an IS. It contributes to the need to research new approach theories and frameworks that will address the changes in the field. There are currently several sourcing theories and frameworks, including the Transaction Cost Economic (TCE) theory, the Resource-based View Theory (RBV), and Agency Theory, which are analysed in turn to determine which is most suitable to be used in this research, as discussed further in the next section.

## 2.7 ANALYTICAL THEORIES AND FRAMEWORKS

The literature review has highlighted that there is a lack of analytical theories and frameworks specifically designed for the investigation of insourcing, and consequently, this research will study and analyse the most utilised theories currently used in IS/IT outsourcing research, including transaction cost economics theory, resource-based view theory (RBV) and agency theory (Alsudairi & Dwivedi, 2010; Gonzalez et al., 2006) , as well as institutional theory and the capability approach. It is hoped that these theories and frameworks will provide useful information when identifying the suitability of theory and frameworks to be applied in this research.

### 2.7.1 Transaction Cost Economics

Transaction cost economics (TCE) is based on an economic rationale and is widely used in IT outsourcing to explicitly addresses boundary decisions (Hätönen & Eriksson, 2009; Vitharana & Dharwadkar, 2007). According to Lacity & Willcocks (1995), TCE is believed to provide the best decision-making tools to help organisations to decide whether to outsource their systems, and how to best prepare for any forthcoming outsourcing arrangements. Although TCE may have

the potential to give a better insight into the implementation of insourcing, it focuses more on make-or-buy decisions on the constructs of transaction attributes, governance structures and costs (Lacity et al., 2011b) and ignores considerations related to technology, innovation, learning and capability. As a consequence, TCE is not deemed suitable for this study.

### 2.7.2 Resource-based View Theory

The resource-based view theory (RBV) is used to identify the critical dimensions of the resources required and the strategic value of the IS development project sourcing decisions (McIvor, 2009). The RBV is largely focused on applying concepts of strategic management in order to better understand the relationships between resources, capabilities, competitive advantage and profitability. It is also used to exploit to maximum effect the unique characteristics of the organisation, which allow competitive advantage to be sustained over time (Grant, 1991). The RBV is predominantly focused on an organisation's resources and performance to increase its profitability, but neglects the considerations of technology, and therefore, the RBV is not suitable for use in this study, given the intention to explore and identify the enabling and inhibiting factors of insourcing implementation that involve technology, capabilities and institutions.

### 2.7.3 Agency Theory

According to Miles (2012), agency theory refers to an agent or agency hired by one or more person(s) (called the principal(s)), under a contract, and is compensated by the principal to achieve desired outcomes for the principal. Agency theory enables organisations to better manage their IS projects, with a systematic emphasis on relational and cultural factors. It may also help contain cost overruns and increase client satisfaction (Rai et al., 2009). However, it has been suggested by Rossignoli & Ricciardi (2015) that the relationship between the principal and the agent, based on agency theory, can lead to conflicting goals and interests, along with different attitudes to risk between the principal and the agent. Although agency theory can be used to understand the failure of an IS project, it focuses more on the relationship between the principal and agent, making it more

suitable for the implementation of outsourcing, and as such this framework is not suited to this research.

### 2.7.4 Institutional Theory

According to Miles (2012), the core concept behind institutional theory is that organisational structures and processes tend to acquire meaning and achieve stability in their own right, rather than as a result of their effectiveness and efficiency in achieving desired ends, such as the mission and goals of the organisation. Institutional theory has two substantial themes: derivation from neoclassical economics, and the emergence of sociology and political science (Scott, 2008). This new institutional theory focuses more on the cognitive aspects of institutions that stress the nature of social reality.

According to Walsham & Sahay (2006), there is great potential to study institutional theory in the context of developing countries, because there are currently a limited number of studies using this theory to address issues of development in public sector organisations, where institutional arrangements are often crucial. Institutional theory provides a theoretical basis to explain the imitative behaviour of outsourcing (Singh & Zack, 2006), where there are three mechanisms of isomorphic pressures: coercive (formal or informal pressures); mimetic (organisations imitating other organisations within their field); and normative (normative pressure) (DiMaggio & Powell, 2000). However, according to Currie & Swanson (2009), institutional analysis has been criticised for its lack of an 'agency' dimension in understanding and explaining social phenomena, with organisations often portrayed as 'too passive.'

For the purposes of this research, whilst institutional theory is not suitable to be used on its own, the analysis of the cognitive aspects of institutions that explore the nature of social reality are useful for this study, and therefore institutional theory can be considered in combination with the capability approach to provide the conceptual framework in this study.

### 2.7.5 Capability Approach

The capability approach was developed by Sen (1987) and is considered to be a 'bottom-up' approach, in which a good relationship between welfare economics and modern ethical studies can enrich and benefit both disciplines. The capability approach can provide an important framework for research on development, poverty, justice and social policies (Robeyns, 2005), based on the development of human capabilities, and offering an alternative view of economic theory through the measurement of income, utility, usage and other metrics including gross national product and industrialisation. According to Heeks (2009), the capability approach is increasingly used in ICT4D studies, providing a foundation for future research in this area. Sen (1999) proposed that the capability approach could be adapted for a variety of research purposes, and consequently it is increasingly being applied to different areas of research (Oosterlaken, 2009). Robeyns (2009) found that the capability approach not only evaluates the lives of individuals, but also, in its broader usage, includes other normative considerations and values, including efficiency, agency and procedural fairness. However, both Robeyns (2005) and Heeks & Molla (2009) state that the capability approach is conceptually rich, it is too individualistic and methodologically vague.

Whilst the capability approach is not suitable to be used by itself in this study, the framework focuses on capability elements and the function of technology that can be explored further in this research. Therefore, this framework can be usefully combined with institutional theory in order to provide the conceptual framework in this study.

In summary, by applying both institutional theory and the capability approach, it is suggested that capabilities, institutions and technology are the important predictors of sustained and successful insourcing implementation. A 'top-down' approach using institutional theory uses aspects previously identified to explain processes and outcomes at a lower level. Meanwhile, a 'bottom-up' perspective using the capability approach considers the validity of individual opportunities to achieve what organisations want. Therefore, it is believed that adopting a combination of institutional theory with the capability approach in this research provides an effective rationale.

## 2.8 SUMMARY OF CHAPTER AND CONCLUSION

This chapter summarises the existing IS research focused on insourcing a government IS, examining how this body of literature is relevant to this research.

This chapter has reviewed previous studies to discover if any have considered the implementation of insourcing an IS in both OECD and developing countries. Whilst this literature review has identified the key drivers of success and barriers to IT implementation in organisations, namely the estimation of project costs, the skill of project management, effective communication and the use of ICT; it is clear that there is comparatively little research related to insourcing a government IS. Existing research has focused mainly on outsourcing in OECD countries, and in private sector organisations, and has not explored or identified the overall enabling and inhibiting factors present in the implementation of insourcing an IS in public organisation. Therefore, there is a need for an in-depth study of insourcing an IS, especially in developing countries, a gap which this research intends to fill.

This chapter has sought to critically examine the theories and frameworks that could be used to explore and identify the factors underlying insourcing implementation in public sector organisations. Several sourcing theories were considered, including the resource-based view theory (RBV), transaction cost economic model (TCE), agency theory, institutional theory and the capability approach. All the theories and approaches were assessed to evaluate their suitability for use in this research. Although each of these theories were found to be useful and important in the implementation of sourcing studies, they were not deemed suitable for use as a theoretical lens in achieving the aims and objectives of this study. Instead, it has been decided to combine the 'top-down' approach of institutional theory, and the 'bottom-up' approach of the capability approach, as the analytical framework for this research.

# CHAPTER 3: AN ANALYTICAL FRAMEWORK

## 3. INTRODUCTION

This chapter presents the analytical framework designed to evaluate the implementation of insourcing a government IS, based on the IS insourcing literature reviewed in Chapter 2. This framework provides the starting point for the case studies introduced in the next chapter.

This chapter describes in detail institutional theory and the capability approach; and discusses the application of institutional theory and the capability approach in IS/ICT, the development of a combination of OPTIMISM model, institutional theory and the capability approach for insourcing in a government IS.

## 3.1 OPTIMISM MODEL

The OPTIMISM model was developed in order to identify and address the risks of failure in e-government projects in developing countries, as described in Chapter Two. Initially, Heeks (2003) introduced the model with seven dimensions, and hence the model's acronym is ITPOSMO:

- **I**nformation
- **T**echnology
- **P**rocesses
- **O**bjectives and values
- **S**taffing and skills
- **M**anagement systems and structures
- **O**ther resources: time and money

The ITPOSMO model was modified by Bass & Heeks (2011) in order to analyse and evaluate the gap between the design and reality of the university computing curriculum in a number of African universities. The subsequent design-reality gap is used to measure the design expectations behind any organisational change against a real situation in order to identify any match or mismatch in the context of implementation. In this study, the OPTIMISM model has been selected to map with institutional theory and the capability approach, because of its simplicity. This

model can be usefully adopted as a method to evaluate the development, implementation, and maintenance of ICT projects. The dimensions of the model have been increased from seven to eight, with the acronym OPTIMISM. The dimensions of the OPTIMISM model are:

- **O**bjectives and values (both formal strategies and culture as well as informal goals).
- **P**rocesses (from individual tasks up to broader business and software development processes).
- **T**echnology (ICTs and other relevant technologies).
- **I**nformation (data stores, data flows, etc.).
- **M**anagement systems and structures.
- **I**nvestment resources (particularly time and money).
- **S**taffing and skills (both the quantitative and qualitative aspects of competencies).
- **M**ilieu (the external political, economic, socio-cultural, technological and legal environment).

As mentioned in Chapter Two, the design-reality gap model was used to determine the size of the gap between design expectations and the current realities of the information system or project, which asserts that the larger the size of the design-reality gap, the greater the risk of failure; and the smaller the gap, the greater the chance of success (Heeks, 2003; Bass & Heeks, 2011).

However, this research is not wholly adopting the design-reality gap model, and instead is only using the description and characteristic of each OPTIMISM dimension as a basis from which to further explore the implementation of insourcing a government information system. The detail underlying each of the seven dimensions is discussed in the next section.

### a. Objectives and Values

The first dimension relates to the objectives and values that key stakeholders need for successful development and implementation of the government information system. The project's aims and values should be clearly stated in the organisation's

strategic planning, which in this study, was to achieve 100% usage of the government information system, especially in HRMIS. The objectives outlined must be achievable, which is why a proper strategy must be established from the outset. This is only achievable when it is effectively communicated to the relevant stakeholders, and when they are then actively engaged as users/owners of the information system, with their input and commitment used as a measure in further evaluations. The involvement of key stakeholders in the analysis and/or design of the government information system is vital in achieving a consensus, and also helps to make stakeholder objectives more realistic. Rewards (e.g. messages of management support, increased pay, improved working conditions and opportunities for career advancement) and punishments (e.g. threats, reprimands, transfers, reductions in pay and conditions) can even be used at this point to influence and alter stakeholders' objectives and values (Heeks, 2003; Dada, 2006; Lessa et al., 2012).

**b. Processes**

This aspect of the dimension considers the work processes undertaken in the organisation that are designed to achieve optimisation or minor modification of existing processes within the government information system in order to improve public service delivery. The processes may be located in either the software development process or the business process, but should be clear and systematic to implement, and adopt best practice in order to reduce costs, increase productivity, and improve the quality of the system or application.

**c. Technology**

This considers the technology used in the organisation, namely the software, hardware and network equipment that available for use. It also describes what kind of technology is required by the system or application, and what has been provided by the organisation. The organisation must be fully equipped with all the necessary technology in order to operate and implement government reforms to be delivered using the existing ICT infrastructure, and the organisation must also be prepared to consider replacing and sourcing new ICT equipment when necessary.

### d. Information

The information dimension considers how data and information is stored, and the flows in the system that are necessary to ensure that that information is easy to access, relevant, accurate, consistent, reliable, up-to-date and easy to understand. The information must be tailored and easily available to meet the needs of all stakeholders; who need to be fully informed about the government information system, in order to engage and contribute to the success of the system. The creation of formal strategic information is of huge value to the organisation's functioning. Informal information may also be used by stakeholders to influence any decision-making process.

### e. Management Systems and Structures

Management systems and structures are required in the organisation to support strategic decision-making. The structure of the organisation must be clearly communicated, and all employees must be properly aware of both their role and the wider management structure of the organisation. All staff must play an important role in the development and implementation of government information system in order to ensure that the system is successfully implemented. The organisation must take full control of the government information system and make an explicit commitment to retaining existing management systems and structures within it.

### f. Investment Resources

Investment resources refers to items such as the time and money required to successfully implement and operate the government information system. The organisation must generate the necessary revenue and finance from central government agencies to complement existing strategies in order to acquire and maintain the resources required for the development and implementation of the government information system. There is a desire to prioritise a government information system that provides greater impact to staff, whilst scaling down

ambitions for information system projects, using all possible tools and management techniques to reduce excess waste and delays.

**g. Staffing and Skills**

This item refers to the staffing numbers, skill levels and types required by the organisation, ensuring that there are adequate core staff in place to deliver the necessary training, bearing in mind that their salaries and other benefits need to be met. Motivational programmes should be developed to reward outstanding staff; with training and development programmes also developed to update the skills and knowledge of existing staff.

**h. Milieu**

Milieu in this context refers to the physical or social setting in which something happens or develops, relating to the political, economic, socio-cultural, technological or legal environment that can shape and otherwise affect the organisational environment. The milieu is an external factor that may have an impact on the productivity, decision-making process or reputation of the organisation, due to political or legal involvement in the operation of the organisation.

In summary, the OPTIMISM model can help organisations to identify and evaluate the critical success or failure factors of the project or IS during the process of implementation; providing both a status check or a guide for future activity. The OPTIMISM model may also help the management of an organisation to focus on the key issue of the project or IS implementation, which can then be applied to any situation requiring organisational or governmental change as it relates to culture, common preconceptions and existing rigidities. Furthermore, the OPTIMISM model can enable organisations to identify and further investigate the technical issues needed to address underlying human and organisational factors, thus offering a systematic and credible basis for project reporting and analysis.

## 3.2 INSTITUTIONAL THEORY

According to Walsham & Sahay (2006), there is great potential to study institutional theory in the context of developing countries. Furthermore, even fewer studies have addressed issues of development in public sector organisations, in which institutional arrangements are often crucial. Institutional theory emphasises that organisational structure and actions are shaped by the institutional environment (Scott, 2013). North (1990) defines 'institutions' as the rules of the game in society that shape human interaction. They also shape the way societies evolve through time via the mechanism of institutional change.

The concept of institutions is described by Scott (2008), *"comprised of regulative, normative and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life"* (Scott, 2008; pp. 48). Oliveira & Martins (2011) state that institutional decisions are not only driven by goals of efficiency, but are also influenced by social and cultural factors and concerns for legitimacy. Thus, an institution combines certain social norms, cultures, structures and routines to achieve its mission and goals, which include the attainment of organisational legitimacy, a key of component of institutional theory.

Jepperson (1991) defines an institution as '*a social order or pattern that has attained a certain state or property*' (pp. 143); institutionalization '*denotes the process of such attainment*' (pp. 144); and Institutionalism, as '*a theoretical strategy that features institutional theories and seeks to develop and apply them*' (pp. 145). According to DiMaggio & Powell (2000), institutional isomorphism is the process by which organisations within a particular industry become homogenous over time, where they may copy industry leaders or adopt similar processes. In other words, isomorphic pressures and the pressure for legitimacy drive organisations to become more similar in the same field. Organisations must modify both their direction and behaviour to become compatible with their environmental characteristics.

They also added that there are three types of isomorphic pressures or effects, namely 1) coercive isomorphism that stems from political influence and the

problem of legitimacy; 2) mimetic isomorphism, resulting from standard responses to uncertainty; and 3) normative isomorphism, which is associated with professionalisation. Teo et al. (2003) found that an organisation's predisposition toward an IT-based inter-organisational system can be influenced by mimetic, coercive and normative institutional pressures that exist an institutionalised environment. According to DiMaggio & Powell (2000), coercive isomorphism is the pressure experienced by an organisation from other organisation or entities, which the organisations are dependent on, to act in a certain manner. This shows that powerful organisations tend to force less powerful organisation to adhere to certain actions and behaviours to receive legitimacy and its subsequent benefits. Such power takes various forms, whether formal or informal, direct or indirect, and includes both cultural expectations and ethical considerations.

Mimetic pressures result when an organisation imitates the practice or innovation of another organisation or their competitor in a similar field that they perceive as more successful or legitimate. On the other hand, normative pressures exist from information, rules and norms sharing amongst members of a network. This may facilitate consensus, which, in turn, increases the strength of norms and rules that became entrenched among members of a network (DiMaggio & Powell, 2000). However, according to Suddaby (2010), institutional researchers should adopt an internal perspective to understand properly how the systems are understood and interpret the meaning of the institutions within organisations. This is mainly because most institutional researchers are more focused on the outcomes or products of institutional influences on organisations, which are external to the organisations.

### 3.2.1 The pillars of Institutions

There are three key pillars of institutions, as described by Scott (2013), which can support institutions, namely *regulative, normative,* and *cultural-cognitive*. The pillars are as follows:

| | **Regulative** | **Normative** | **Cultural Cognitive** |
|---|---|---|---|
| Basic of compliance | Expedience | Social obligation | Taken for grantedness<br>Shared understanding |
| Basic of order | Regulative rules | Binding expectation | Constitutive schema |
| Mechanisms | Coercive | Normative | Mimetic |
| Logic | Instrumentality | Appropriateness | Orthodoxy |
| Indicators | Rules, Laws, Sanctions | Certification<br>Accreditation | Common beliefs<br>Shared logics of action<br>Isomorphism |
| Affect | Fear, Guilt/ Innocence | Shame / honour | Certainty / Confusion |
| Basis of Legitimacy | Legally sanctioned | Morally governed | Comprehensible<br>Recognisable<br>Culturally supported |

Table 3.1: The Three Pillars of Institution (Source: Scott, 2013)

Table 3.1 is a guide explaining some of the principle dimensions of different assumptions and arguments arising from theorists who emphasise one or more element.

### *a. Regulative*

According to Scott (2013), almost all scholars have emphasised the regulative pillar, particularly regarding explicit regulatory processes, which are rule-setting, monitoring and sanctioning activities. The regulatory process attempts to influence future behaviour, which the capability creates, and establish rule-setting, to inspect others' conformity and manipulate sanctions by giving rewards and punishments.

Jepperson (1991) states that institutions can be divided into two viz. formal rules and informal rules. Formal rules include political rules, economic rules and contracts which relate to the constitution, laws and regulations, while informal rules include taboos, customs and traditions in relation to work practices and local

resources available. Both formal and informal institutions help to pattern human behaviour by alternatingly enabling and constraining activities. However, the process of organisational change will be easier if the overlap is greater between the formal and informal institutions (Piotti et al., 2006). Based on the institutional isomorphism by DiMaggio & Powell (2000), coercive pressures may be considered the main mechanism of control in the regulative system.

### *b. Normative*

Scott (2013) indicates that normative system introduces a prescriptive, evaluative and obligatory dimension into social life, which includes values and norms. It may also be described as the rights, privileges, responsibilities and duties. Values refer to the construction of standards with the preferred or the desirable together that the existing structures or behaviours can be compared and assessed. On the other hand, norms can be referred to as how things should be done, which is a standard or pattern can be considered as typical. Therefore, the goals and objectives of an institution are determined by normative systems by determining appropriate ways to pursue them.

Norms and values vary depending on the actors or the position of the actors. Goals and activities are given to a particular actor or position in accordance to the creation of normative roles or expectations of how certain actors are required to act. Roles can happen informally, constructed through interaction, to guide behaviour, and can also occur formally when the position has been defined to carry specified rights and responsibilities, similar to the regulative system. According to Scott (2013), the normative concept was embraced by most early sociologists to examine the types of institutions such as social class, religious systems, community and voluntary associations where there is an existence of common beliefs and values. Moreover, sociologists and political scientists examining organisations continue to guide and inform much contemporary work. As with regulative systems, confronting normative systems can also evoke strong feelings, but this is quite different from those in the violation of rules and laws.

### *c. Cultural Cognitive*

The cultural-cognitive aspect of institutions may be described as "*the shared conceptions that constitute the nature of social reality and the frames through which meaning is made*" (Scott, 2013; DiMaggio & Powell, 2000). According to Posthuma (2009), the cultural-cognitive aspect influences the collective programming of minds because different cultures have different concepts of individuals that will influence their choices and behaviours. Cultural-cognitive aspects can operate at multiple levels within different contexts in countries or organisations and influence how individuals respond to and perceive an institution.

Therefore, organisational change from the cultural-cognitive perspective may be generated and sustained when organisational members need to internalize and value the premises of change, even though change is not enforced through an organisational policy (regulative) or workplace norm (normative) (Posthuma, 2009). According to DiMaggio & Powell (2000), mimetic isomorphism can be perceived in cultural-cognitive systems as a major mechanism of control that can structure organisational fields to shared assumptions and ideologies to be accepted by individual actors or organisations.

In summary, the relationship between regulative, normative, and cultural-cognitive is complex and difficult to separate because each pillar has its own characteristics and ways in which they operate as shown in Table 3.1. However, according to Scott (2013), when these elements are combined and aligned at work, the strength of their forces can be formidable, leading to a stable social system.

## 3.2.2 Application of Institutional Analysis in IS/ICT

Most social science researchers have used powerful institutionalist concepts like coercive, normative and mimetic as a 'catch-all' to explain social phenomena (Currie & Swanson, 2009). Institutional theory is also widely used by researchers covering different contexts in the field of IS/ICT, as noted by Weerakkody et al. (2009) and Mignerat & Rivard (2009). According to Currie (2009), IS researchers should engage more with institutional theory because it is more appropriate to analyse and understand complex social phenomena. King et al. (1994) argued that

institutional interventions are very important elements to influence and regulate the ideologies of governing supply-push and demand-pull approaches, which have a direct impact and important consequences for IT innovation process. In this case, coercive pressure seems to be a major mechanism to continue and accelerate IT innovation throughout the world.

Kimaro & Sahay (2007) have used institutional theory to explore the institutional challenges that shape the decentralisation of Health Information Systems (HIS) in the context of developing countries from the political, administrative, health management and health service delivery systems perspectives. They have studied how the formal and informal constraints or coercive pressures related to the ICT project are intertwined with other institutional systems. The results of their study found that the hierarchical nature of an organisation causes an overlap between the formal rules and informal constraints, as well as a lack of interlinkages between the different institutional systems within the same level. Therefore, normative pressures are required at the political and managerial levels to deal with the challenges of ICT projects.

Daqing (2010) applied institutional theory to examine the organisation's commitment to the adoption process of an IS in a Chinese public organisation. A top-down approach was applied. Chinese public administration organisation is a classic bureaucratic organisation, and the superior coercive pressure is the main influence the adoption of an e-government system in the Chinese government. The superior public organisation imposed the superior coercive pressures to a junior public organisation that determined the development of the IS, whereas the mimetic pressures are influenced by the superior managers or superior organisation.

Fan & Niu (2013) used institutional theory to investigate the development and adoption of a national e-government standard from the perspective of institutional theory. Their research involved a case study and found that coercion was the most effective pressure in the first stage of the development of government interoperability framework to have a positive impact on government agencies. Normative pressure was used in the second stage for the improvement of

government service quality and mimetic mechanism in the third stage for the implementation of e-government standards. Therefore, the institutional theory is a useful framework for this research for the development and diffusion process of e-government process in China.

## 3.3 CAPABILITY APPROACH

The capability approach was introduced by Sen (1999) and conceptualises the capability approach as a basic concern about the human development, their capability, responsibility and the opportunity. The development at an individual level is a more important consideration in the capability approach than in aggregates because each person has different levels of support to achieve similar goals. Amartya Sen conceptualised such capabilities as "doing and being", which are skills, aptitudes, endowments and potentials. Therefore, individuals must make choices in their lives as a consequence of living the life they choose.

Mchombu et al. (2004) explains that the human development and capability approach wants to see ICTs as tools or vehicles that are complimentary to traditional channels of communication, to establish and increase access to information for all groups in the population, to promote autonomy and participation, and to protect indigenous or traditional knowledge and locally-generated information. According to Robeyns (2005), the capability approach as the design of policies and proposal about social change in society that has a broad normative framework for the evaluation and assessment of individual well-being and social arrangements. It also evaluates policies according to their impact on people's capabilities whether people are healthy and whether the means or resources necessary for this capability are present. Alkire (2008) stated that the capability approach is a working set of policies, activities and recommendations to generate considerable capability expansion. It also seeks to empower a person to become an active agent in social and political structures as well as within the home. However, the capability approach makes it difficult to identify which course of action is better. A given approach could be better in some area or group but worse for others. It is also detrimental to the freedoms of others with regard to either physical or psychological harms (Deneulin & McGregor, 2010). In addition, the

capability approach is difficult to operationalise and to be individualistic (Heeks & Molla, 2009).

### 3.3.1 Capabilities

According to Sen (1999) and Ooterlaken (2009), capabilities can be described as "what people are effectively able to do or be" regarding their desires for better lives. Thus, capabilities can be referred to the alternative combinations of functionings that are possible for an individual to choose from. Therefore, the main purpose of development should be conceptualised as the 'substantive freedoms' and expanding people's capabilities to lead the lives they live (Sen, 1999). Zheng (2009) added that capabilities are the various combinations of functionings that a person can achieve that can reflect the person's freedom to lead one type of life or another. Examples of capabilities include literacy, health and political freedom.

Sen (1990) stated that "capability reflects a person's freedom to choose between different ways of living" (pp. 44), which means that their experiences and desires heavily influence the individuals lives. Considered in this context, tools and technology are an intricate part of the progress of humanity as they can enhance our capabilities to enable us to do more with our life, or at least to do different things with our life. For instance, ICTs can enhance the capabilities, which enable people to make better judgements from information shared through technology. However, they have to access to knowledge that was not available to them.

### 3.3.2 Functionings

Sen (1999) described functionings as actual achievement or beings or doings of an individual, such as being literate, being healthy, and being able to participate in different aspects of societal life. Oosterlarken (2009) described them as "together constitute[ing] what makes life valuable" (pp. 141) which are "constitutive of a person's being" (pp 141). According to Zheng (2009), functionings are "beings and doing", which can be considered as constitutive of well-being to realised achievements and fulfilled expectations. Examples of functionings are working, resting, being literate, being healthy, being part of a community, being able to travel and being confident.

### 3.3.3 Agency and Choice

Sen (1999) defines an agent as "*someone who acts and brings about change, and whose achievements can be judged in terms of her own values and objectives, whether or not we assess them in terms of some external criteria as well*" (pp. 203). And an agent can be defined as an individual should be given the right condition and has the ability to pursue and realize the goals that one values. According to Deneulin (2006), an individual agent has the ability to act and shape his destiny to address and overcome human deprivations. On the other hand, the choice is an individual who has been exposed the varied options of personal preference before making any decision.

In principle, the capability approach is also concerned with the ability of an individual to exercise their agency freedom, not only with the possession of and access to resources. For example, for the development of the internet, access to the Web and the freedom of communication has become a very important capability. The word "capability" as used by Zheng (2007) in this context refers to people's ability to use ICTs, which it concerns about the opportunities and options for people to access and use ICTs to improve the quality of life as well to accomplish their goals. Thus, Sen (2005) has recognised the importance of information technology development in social conditions and priorities.

### 3.3.4 Application of Capability Approach in IS/ICT

Researchers in the field of IS/ICT and ICT4D have applied the capability approach. According to Zheng (2009), in the context of development, ICT is perceived as a commodity that has to do with conversion factors and decision-making mechanism. Hence, the capability approach in the field of IS/ICT can help to pursue human development by adopting functionings and capabilities to evaluate poverty, inequality and development. Using the capability approach, James (2006) investigated the impact of the internet on poverty, but was limited to the functionings aspect. Though it is contrasted with other economic theories of consumption, the capability approach has been proven at the World Summit on the Information Society in 2003 to be useful to analyse the actual usage and the impact of the internet.

Olatokun (2009) used the capability approach to examine demographic differences in the use of ICTs within a developing country; the core elements of commodities and functionings have been applied in this study with a reference to capabilities as the "set of vectors of functionings" (pp. 484). The study was valuable in developing the concept of the digital divide as well as socio-demographic dimensions of gender and age. Zheng & Walsham (2008) adopted the capability approach, which consists of the core elements of commodities and capabilities, to examine social exclusion of one group of people may cause capability deprivation in another group. The study was focused on the functionings of individuals that can use ICTs effectively and how capability deprivation may cause the deployment of ICTs not to lead to development outcomes.

In addition, Hatakka & De' (2011) adopted the capability approach, comprising the core elements of commodities and capabilities, to evaluate the contributions of an ICT for development initiative. However, the applications of the capability approach focusing more on capability elements and more explicitly on the function of technology within the development initiatives. They also considered the deployment of the system with the potential functionings available and the treatment of ICTs as commodity consisting of technology and supportive interventions. Another study by Kivunike et al. (2009) used the capability approach to determine how ICT can have an impact on quality of life regarding what individuals are able to do. The issue focuses on the aspects of freedom that can influence the usage of ICTs in rural communities in conceptualising a set of rights and opportunities.

## 3.4 COMBINATION OF INSTITUTIONAL THEORY AND THE CAPABILITY APPROACH

The approach of this study is to combine institutional theory and the capability approach into a framework specifically developed to create a model of insourcing in a government IS. The capability approach was derived by Sen (1987), in which a good relationship between welfare economics and modern ethical studies can enrich and benefit both disciplines. Institutional theory conversely focuses more on the cognitive aspects of institutions that stress the nature of social reality

(Scott, 2008). Therefore, combining the institutional theory and capability approaches would share the same common measurement and complement the body of research in the change process of development and technology.

A "top-down" approach using institutional theory uses something identified to explain processes and outcomes at a lower level. A "bottom-up" approach using the capability approach considers the opportunities of individuals to achieve their wishes. Bass et al. (2013) applied the combined framework in their study and explained the benefits of the framework in the ICT4D domain. The framework provides clarity about the social drivers that can excite or inhibit individuals from taking full advantage of ICT resources for the furtherance of their own lives. They also observed how to strengthen and develop institutions from the enhancement of the capabilities. Bass & Thapa (2014) also used the combination of institutional theory and the capability approach to investigate teaching skill shortages that affect rural schools in the Global South. The study focuses on capacity building for teachers and studies how the videoconference multi-casting project could help to develop the capabilities of teachers to enhance the chances of success.

Dahiru et al. (2014) also used the same framework as a tool for analysing the use of cloud-hosted applications in sub-Saharan Africa. In their study, they discovered that security, privacy and trust in data are the most important aspects in determining the adoption of cloud computing in the global north, compared to SMEs in sub-Saharan African countries. However, the huge amount of computing resources required for the adoption of cloud computing is a compelling concern of SMEs in sub-Saharan African countries. Therefore, this research uses the approaches used by Bass et al. (2013), Bass & Thapa (2014), and Dahiru et al. (2014) to explore and identify the enabling and inhibiting factors in the implementation of insourcing an IS by the public organisation.

### 3.4.1 Description of Framework

The analytical framework is capable of modelling the factors that inhibit or enable individuals from taking full advantage of ICT resources. The framework is used to study the relationships between technology and institutions and how institutions

recommend insourcing a government IS according to their cultural, social and institutional features (Bass et al., 2013). The capabilities approach is focused on individual capabilities and their welfare, whereas the institutional theory focuses on social and organisational factors.

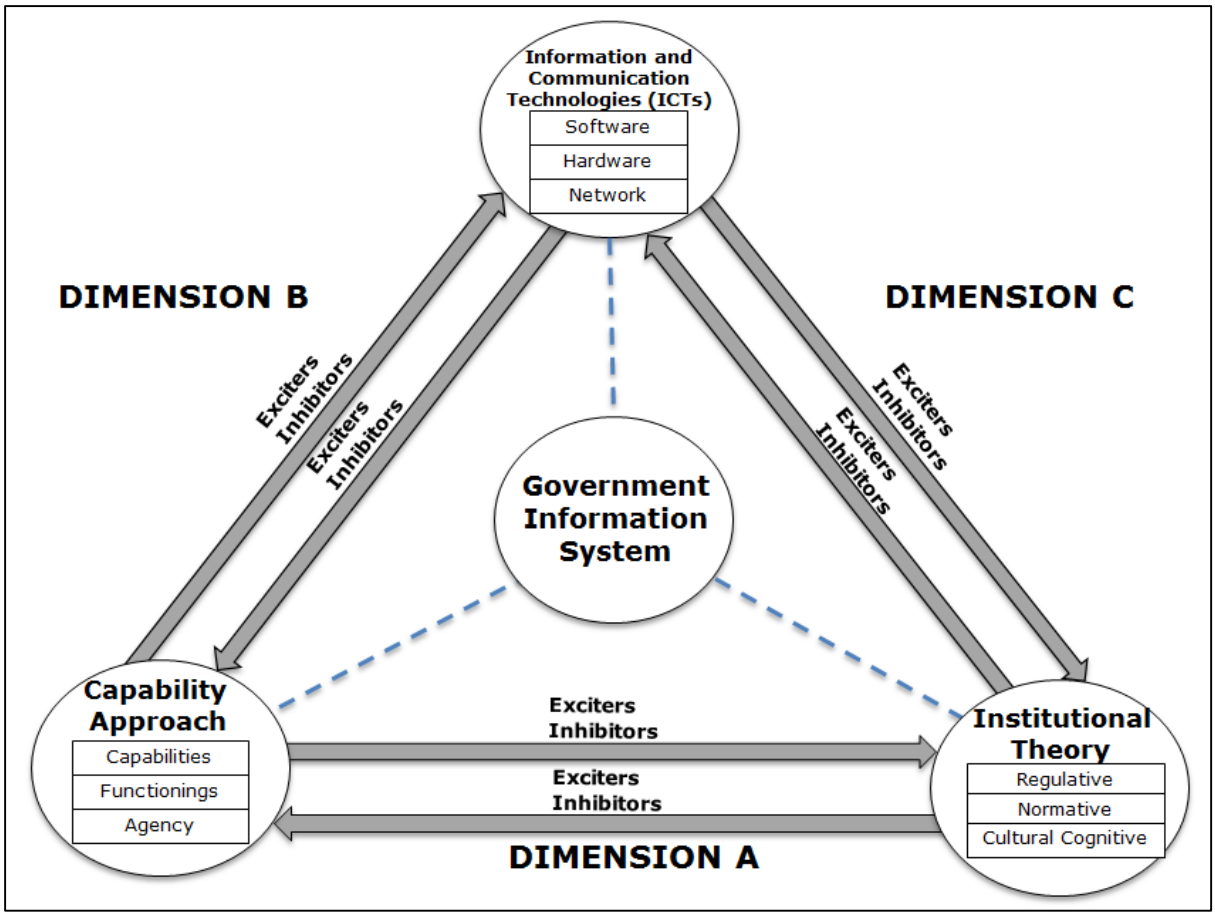


Figure 3.1: Institutional Theory, the Capability Approach, and ICT (Source: Bass et al., 2013)

Institutional theory and the capability approach are the main elements of the framework explained in sections 4.1 and 4.2. ICTs were described in section 2.6.1. ICT4D refers to the use of ICTs for the development of society. The influences or effects can either be positive or negative as represented by the bi-directional arrows between institutions and capabilities; institutions and technology; as well as technology and capabilities. Positive influence is referred to as exciters and negative influences are referred to as inhibitors, as shown in Figure 3.1.

The goal of insourcing a government IS may be affected by a combination of institutions, capabilities and technology. A "bottom-up" perspective on the

capability approach is the starting point that gives consideration to individuals' opportunities to achieve their desires and needs, whereas a "top-down" perspective of institutional theory provides the rules and norms used to regulate interactions and transactions in society (Bass & Thapa, 2014). By combining these perspectives into a framework, the research gains unique insights into the field of study.

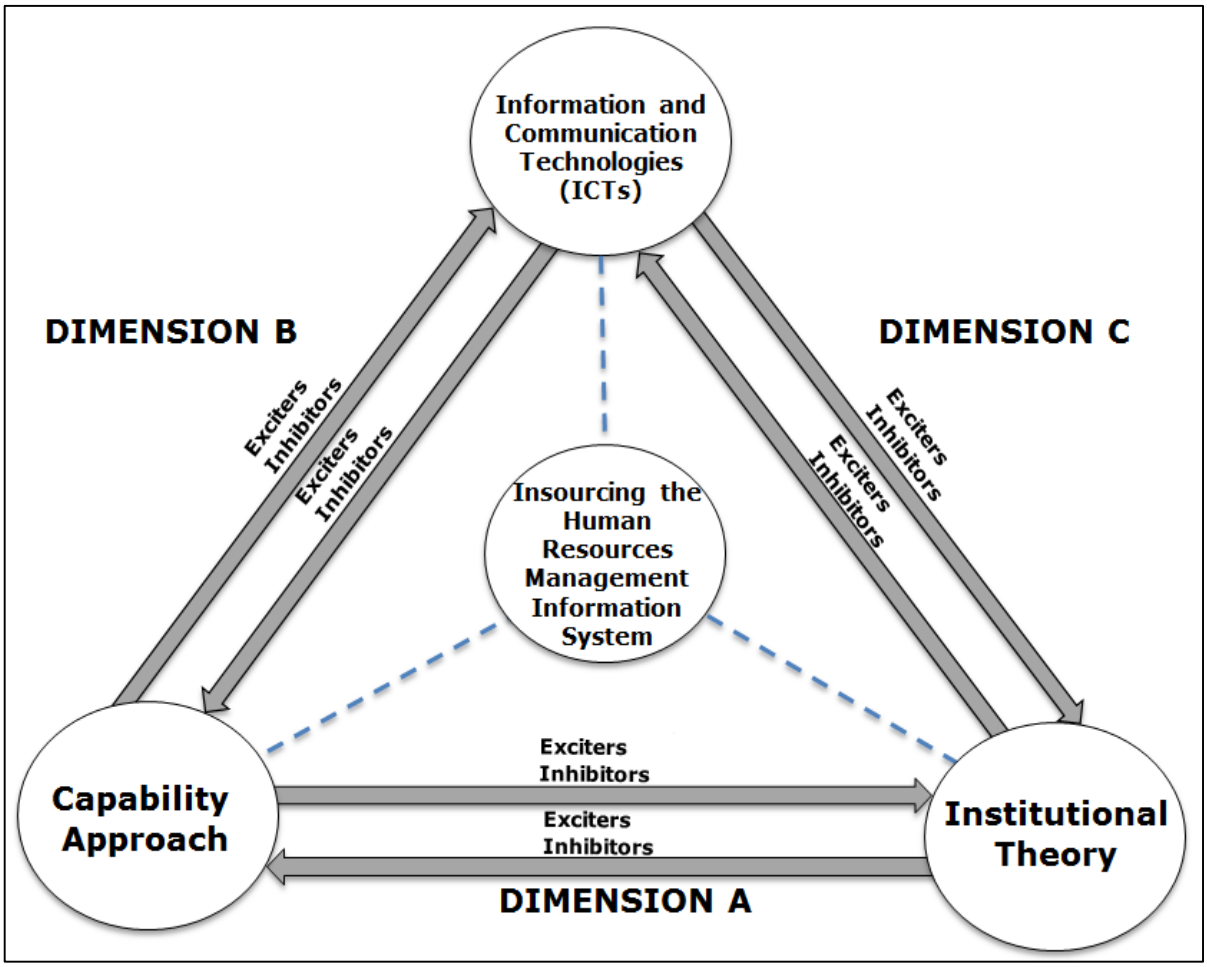


Figure 3.2: Adaptation of the Framework

The researcher has adopted and modified the analytical framework by using the institutional theory and the capability approaches, linking institutions, capabilities and technology as shown in Figure 3.2. In Dimension A, group or individual capabilities may have a positive as an exciter or negative as an inhibitor on the formal rules and informal norms identified towards institutions or vice versa. Group or individual capabilities may be perceived to help the institution to manage the resource more efficient and effective in terms of cost, time and staff. The institution plays important roles to ensure that a group or individual is managed properly and

provided with enough resources, such as budget allocation and training, to facilitate the process of system development and maintenance in the organisation.

In Dimension B, group or individual capabilities may have a positive effect (an exciter) or negative effect (an inhibitor) on the technology/ICTs, which the competencies of a group or individual capabilities would expedite or delay the process of insourcing implementation in the organisation. Meanwhile, ICTs provide access to information resources that can help groups or individuals to enhance their skills and knowledge. In this dimension, mimetic pressures used by the technology could accelerate the process of system development. In Dimension C, the relationship between institutions and technology where the technology can increase transparency by providing information about the system to stakeholder groups especially to top management. Coercive pressures from institutions to ICTs can increase the capacity and improvement of the systems but at the same may also hinder the implementation of insourcing a government IS because the technology used must align with the current developments.

## 3.5 MAPPING OPTIMISM MODEL WITH THE ANALYTICAL FRAMEWORK

Based on the simplicity of OPTIMISM model and the complexity of institutional theory and the capability approach framework, these can be mapped together to complement each other to cover a broader perspective. Although the OPTIMISM model is simple and straightforward to apply and analyse, not all the dimensions can be mapped into in the analytical framework. It can be observed that the eight dimensions of OPTIMISM model only can be mapped into Dimension A, Institutions and Technology in the analytical framework, as shown in Figure 3.3.

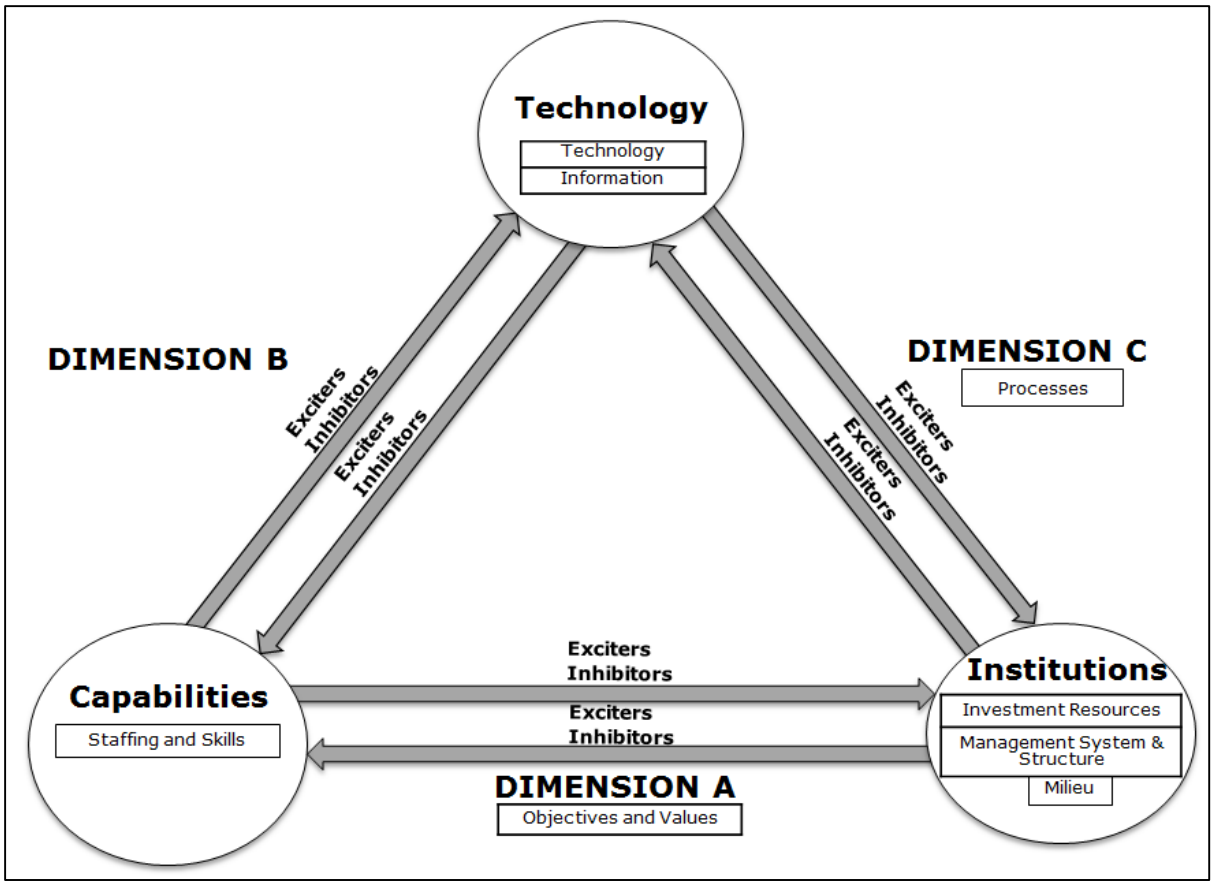


Figure 3.3: Mapping the Analytical Framework with OPTIMISM Model

Obviously technology in the OPTIMISM dimension is similar to technology in the Technology domain in Figure 3.3. Technology is related to the software, hardware and network that being used by the staff and user. Information dimension is mapped onto Technology domain because it concerns how the data and the information are stored and flows in the system which, information should be easy to access, relevant to basic purposes, accurate, consistent, reliable, up-to-date, easy to understand and it has to be tailored to the needs of stakeholders. Technology domain controls these dimensions and Capabilities and Institutions do not affect them.

The OPTIMISM dimensions that mapped onto the Institutions domain in Figure 3.3 are investment resources, management system and structure, and milieu. Investment resources of OPTIMISM model is mapped onto the Institution domain because the institutions provide the financial resources to facilitate the process of system development, maintenance, implementation, software procurement and

training of the staff to enhance the capabilities and competencies of staff. The investment of time by institutions also play a vital to make sure the system can be developed within the time frame. A management system and structure is mapped onto Institutions domain because it shows on how the institutions manage an organisational system and structure, and changes in the organisational structure and system could give an impact to the capabilities and technology. It should reduce bureaucracy, improve efficiency, and focus organisations on their stakeholders, which it related to the regulative pillar in Institutional Theory. Whereas Milieu mapped into the Institutions domain because it involved political, economic, socio-cultural and legal that controlled by institutions to shape the organisational environment. The milieu is directly impact from the regulative pillar in which it involve formal rules include political rules, economic rules and contracts that relate to the constitution, laws and regulations. The milieu is an external factor, which may have an impact on the productivity, decision-making process and reputation of the organisation due to political and legal involvement in dealing the organisation.

Staffing and Skills in the OPTIMISM model is mapped onto the Capabilities domain in Figure 3.3 because it shows on how to manage and leverage the knowledge and skills of staff so that they have skill and knowledge in technology, business operations, management, and interpersonal skills to effectively lead organisational activities. Therefore, the role of capabilities and functionings in the Capability Approach play an important to ensure that internal staff are provided and they should have appropriate qualifications and experience to use their skills and further develop both technically and professionally in ways that can help them to achieve the goals of the organisation.

Objectives and Values of OPTIMISM model is mapped onto the Dimension A in the analytical framework because the objectives and values of the capabilities can be different with objectives and values by the organisation, this can lead to a conflict that can affect the institutions and capabilities to achieve common objectives and values. Therefore, norms and values in the normative pillar of Institutional Theory can influence the role the actors or the position of the actors in determining the objectives and values of an organisation.

The processes in the OPTMISM model is mapped onto Dimension C in the analytical framework because the processes are concerning how the work processes undertaken in the organisation such as the system or software development and business processes. The process is a series of actions or steps taken in order to achieve a particular end, which it will involve the regulative pillar in Institutional Theory and technology to ensure the success of development and implementation of government information system. For example, the processes can be optimised without any change to ICTs or new ICTs are brought in which it will involve the business process such as procurement for buying a new ICTs equipment.

## 3.6 SOURCING FRAMEWORK

In order to develop an analytical framework for this research, the theories, frameworks, and approaches conducted by other researchers have been reviewed and discussed in chapter two, which are very useful and important in the adoption of IS/ICT studies. In spite of researching extensively insourcing domain, the researcher could not find a suitable framework that could be used to achieve the objectives of this research. Hence, this research will explore and identify the enabling and inhibiting factors in insourcing a government IS. Thus, the interaction between capabilities, institutions, and technology are important elements in the software development process (this is important components in insourcing).

A study was conducted by Barney et al. (2011) using Dromey's quality model (Dromey, 1996) for global software development (GSD) to evaluate software product quality by determining the alignment between success-critical stakeholder groups. The study was to understand the level of alignment between groups that are more concerned about the power of the stakeholders but neglect the issues of technology and capabilities. The theory of Transaction Cost Economics (TCE) used by Salge (2015) was used to investigate the transaction cost between IT outsourcing and insourcing that can influence the sourcing decision by management in term of project-level, production and transaction characteristics. Asset specificity, uncertainty, transaction frequency, bounded rationality and the threat of opportunistic behaviour by the vendor are the key project characteristics

under TCE. However, the research was focused more on the improvement of the firm performance, showing concern about power and technology but neglecting the issue of capability.

Vitharana & Dharwadkar (2007) adapted the transaction cost theory (TCT) and institutional theory in their research, since TCT is widely used in the outsourcing domain. The aim of their study was to analyse the organisation's decision to adopt outsourcing based on mimetic normative and coercive institutional pressures arising from the corresponding ex-ante screening and ex-post monitoring processes undertaken by the vendor. However, the study was focused more on power and took a top-down approach to assess the relative impact of transaction cost factors and institutional pressures on outsourcing governance structures, but did not assess the issue of technology and capabilities. On the other hand, Moe et al. (2014) used global software development (GSD), intellectual capital and organisational learning to study the relationship between the client and the vendor. Their study was more focused on capabilities and institutions and less on technology. Moreover, Moe et al. (2012) used the theory of single-loop and double-loop learning (organisational learning) to study the relationship between the client and the vendor and also focused on capabilities and institutions more than on technology. Based on the theories of TCE and TCT, these theories focus on the cost effectiveness of software development and focused on the mimetic, normative and coercive institutional pressures and do not consider the value of technology and capabilities. Therefore, TCE and TCT are not suitable for application in the current study, as it does not focus primarily on the cost of system development.

Institutional theory using the top-down approach offers a broader scope of factors to examine and evaluate system development influenced by the actions of individuals and organisations. On the other hand, the capability approach using the bottom-up approach considers individuals because they can vary significantly in their decisions as to whether to adopt an innovation. For example, the expectations of individuals within the same organisation may be different towards the organisation. Therefore, a combination of institutional theory and the capability approach can complement each other in order to emphasize the

multidimensionality of the implementation of insourcing an IS in a public sector organisation.

The reviewed frameworks were described in chapter two to assist in determining the appropriate framework for this study. Therefore, a combination of institutional theory and the capability approach can assist in exploring and determining the potential of the implementation of insourcing a government IS. Jensen et al. (2009) combined these two theories. They combined institutional theory and sense-making theory to gain an understanding of the reciprocal interactions among technology, people and institutional properties. As the role of IT in organisational change has been more realistically appraised in recent years, Robey & Boudreau (1999) have combined institutional theory with organisational politics, organisational culture and organisational learning to identify the opposing forces during the process of organisational transformation. Connon & Woszczynski (2002) have used institutional theory alongside organisational ecology to investigate and understand the implication of IT managers' roles in a modern organisation. Their perception is that these roles can affect the process of decision-making in critical areas.

Bala & Venkatesh (2007) also combined institutional theory with organisational inertia to improve inter-organisational relationships and process integration in the field of complex technologies. A combination of the capability approach and social capital was adopted by Thapa et al. (2012) to explore the link between an ICT intervention in a developing country and human development. The capability approach was used in their study to examine the interaction of national doctors and health workers with villagers in the areas of healthcare, income generations and education to understand the needs and values, but there is less discussion on technology and interaction with the social process.

### 3.6.1 The Enhanced Model

The enhanced model combines institutional theory, the capability approach, technology and the OPTIMISM dimensions in order to help identify insourcing implementation factors of a Malaysian government information system. In addition, the framework has broader coverage to analyse and evaluate the ICT

project in terms of development, implementation, evaluation, and maintenance from the perspectives of institutions, capabilities, and technology.

The three pillars of institutional theory, which are regulative, normative and cultural-cognitive, need to be understood separately and each of the pillars has a significant impact on the institution. The regulative pillar can be described as explicit regulatory processes that attempt influencing future behaviour. The regulatory processes include rule setting, monitoring, and sanctioning activities. The normative pillar introduces a prescriptive, evaluative, and obligatory dimension into social life. The cultural-cognitive pillar has an influence on the collective programming of minds because different cultures have different thoughts about individuals that will influence their choices and behaviours. When these elements are combined and aligned at work, the strength of their forces can be formidable, which may lead to a stable social system (Scott, 2008). Similarly, with the concept of capabilities and functioning in the capability approach, different scholars prefer different implementations of the model. Capabilities can be described as "what people are effectively able to do or be" regarding their desires for better lives. Functioning includes actual achievement or the states or actions of an individual, such as being literate, being healthy and being able to participate in different aspects of societal life (Sen, 1999).

Although the combination of institutional theory and the capability approach has resulted in common measurements and complemented the body of research, some categories are difficult to map onto the framework. Therefore, a simple framework or model is required to map with the analytical framework to optimise the process of the development, implementation, evaluation and monitoring of an ICT project in the future. As a result, OPTIMISM model has been selected for mapping with institutional theory and the capability approach framework. This is because the OPTIMISM model is simple and straightforward for application and analysis.

However, the eight dimensions of the OPTIMISM model are not neatly mapped into the framework. Therefore, a new dimension is proposed to the OPTIMISM model to form a new model, which is Utility and Usability in Dimension B as shown in Figure 3.4.

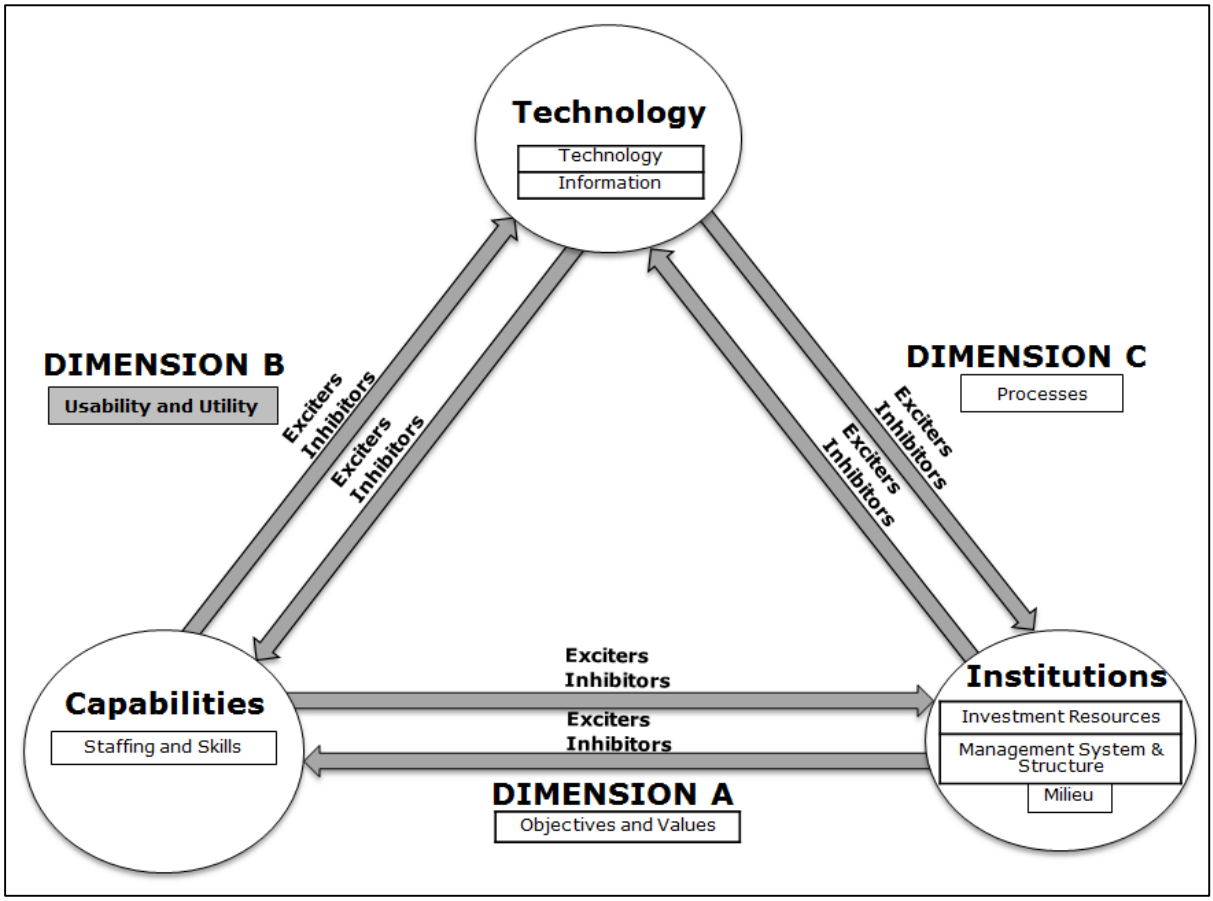


Figure 3.4: The Analytical Framework Model Enhancement

Usability and Utility are proposed in Dimension B because they determine whether they system is useful and easy to use by the stakeholders. Usability and Utility of the system can be affected by Technology and Capabilities, which may be an exciter or inhibitor from Capabilities to Technology or vice versa. Usability is the system quality or how easy user interfaces are that the user can use to access the system. Utility is the system quality of how the system is useful to the user to perform a specific useful function of a computer system. System usability and utility are an important matter, because users' expectation is the IS must be easy to use, have a good response time, and remain trustworthy and reliable. Therefore, the exciter of system usability and utility is the system can provide a better user interface, easy to use, facilitate the users, improve the system security and can increase the stakeholder's capabilities and functioning. The inhibitor of system usability and utility is the stakeholders would perceive the system to be unreliable, untrustworthy and subject to the risk of external hacking.

By mapping the existing analytical framework with eight dimensions of OPTIMISM model without changing the original analytical framework dimensions, this enhanced model can be a risk analysis and evaluation tool in the development, and implementation of ICTs project in public or private organisations. It also to evaluate and monitor the effect of development and implementation ICTs project in the future.

### 3.6.2 The List of Dimensions

As a result of the mapping between OPTIMISM model with institutional theory and the capability approach framework, an extended list of the dimensions has been formed. The enhanced model is a suitable risk analysis and project evaluation tool of ICTs for both public and private organisations. The extended list of dimensions is as follows:

- **O**bjectives and values (both formal strategies and culture, and informal goals)
- **P**rocesses (from individual tasks up to broader business processes, software development processes)
- **T**echnology (not just ICTs but other relevant technologies)
- **I**nformation (data stores, data flows, etc.)
- **M**anagement systems and structures
- **I**nvestment resources (particularly time and money)
- **S**taffing and skills (both the quantitative and qualitative aspects of competencies).
- **M**ilieu (the external political, economic, socio-cultural, technological and legal environment).
- **U**sability and Utility

This enhanced model will be used in this research to see how the interaction between institutions, capabilities and technology/ICTs to strengthen and develop institutions. The analytical framework has helped to identify the enabling and inhibiting factors in the implementation of insourcing a government IS in the context of the Malaysian government. In addition, the framework has broader coverage to analyse and evaluate the ICT project in term of development, implementation, evaluation, and maintenance from the perspectives of

institutions, capabilities, and technology. However, the framework is difficult to understand and apply, as institutional theory and capability approaches each have their own substantial body of literature.

The three pillars of institutional theory, which are regulative, normative and cultural-cognitive, need to be understood separately and each of the pillars has a significant impact on the institution. The regulative pillar can be described as explicit regulatory processes that attempt influencing future behaviour. The regulatory processes include rule setting, monitoring, and sanctioning activities. The normative pillar introduces a prescriptive, evaluative, and obligatory dimension into social life. The cultural-cognitive pillar has an influence on the collective programming of minds because different cultures have different thoughts about individuals that will influence their choices and behaviours. When these elements are combined and aligned at work, the strength of their forces can be formidable, which may lead to a stable social system (Scott, 2008). Similarly, with the concept of capabilities and functioning in the capability approach, different scholars prefer different implementations of the model. Capabilities can be described as "what people are effectively able to do or be" regarding their desires for better lives. Functioning includes actual achievement or the states or actions of an individual, such as being literate, being healthy and being able to participate in different aspects of societal life (Sen, 1999).

Although the combination of institutional theory and the capability approach has resulted in common measurements and complemented the body of research, some categories are difficult to map onto the framework. Therefore, a simple framework or model is required to map with the analytical framework to optimise the process of the development, implementation, evaluation and monitoring of an ICT project in the future. As a result, OPTIMISM model has been selected for mapping with institutional theory and the capability approach framework. This is because the OPTIMISM model is simple and straightforward for application and analysis.

## 3.7 SUMMARY OF CHAPTER AND CONCLUSIONS

This chapter begins with an explanation of institutional theory and its applications in the field of IS/ICT domain. This is followed by a description of the capability approach and its applications in the IS/ICT field. A combination of the institutions and capabilities approaches was chosen for this research as an analytical framework that could contribute to the explicit understanding of insourcing a government IS and explain the exciters and inhibitors along the process. This means that the analytical framework has the capability to evaluate the impact of insourcing on the institutions, capabilities, and technology, along with the benefits and challenges of the insourcing implementation in the public sector organisation. This framework can be used as a descriptive tool to organise and analyse the exciters and inhibitors affecting insourcing implementation in the public organisations. It contributes to the body of knowledge about the phases through which insourcing implementation is conducted and carried out.

# CHAPTER 4: RESEARCH METHODOLOGY

## 4. INTRODUCTION

Chapter 3 outlined the process of framework selection for this research. This chapter will turn to explain the methodology adopted to conduct this study. According to Kothari (2004), a research methodology is required in order to search for a hidden truth that has not been discovered by applying a systematic procedure (pp 2). The selection of the research methodology can determine the nature of the research problem and how it should be investigated, and also plays an important role in ensuring the validity and accuracy of both data and findings.

This chapter consist of seven sections. Section 4.1 describes the research and philosophical perspective adopted; Section 4.2 introduces the research design; Section 4.3 presents the research methods used; Section 4.4 discusses the transcription and translation of data; Section 4.5 considers the ethical issues uncovered in the study; Section 4.6 considers the reliability and validity of the research; before Section 4.7 provides the chapter's summary and concluding remarks.

## 4.1 PHILOSOPHICAL PERSPECTIVE

Traditionally, there are two main philosophical research paradigms located at the epistemological level, positivist and interpretivist. However, both Myers (1997) and Oates (2005) have claimed that the philosophical paradigms of any research in a social or natural science discipline are positivist, critical and interpretive. Positivist research is deductive in its nature, attempting to test theories or to increase the predictive understanding of phenomena (Myers, 1997), seeking to address the 'what' aspect of research that describes an incidence or when a situation is predictive of a particular outcome (Yin, 2014).

Critical research is intended to challenge the status quo, overcome injustice and alienation and promote emancipation (Stahl, 2008). Interpretive research is an inductive approach used to understand human thoughts and actions from a real-life perspective (Myers, 1997). An interpretive research approach has been adopted for this study, as it increases our understanding of how people think or

feel about something and why, what their perspectives and situations are, and how they influence what is happening. Interpretive research is typically interested in the way people experience, perceive, understand and interpret their lives and the nature, or reality of the world around them (Oates, 2005). Interpretive research in IS, as defined by Walsham (1993), is "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context" (pp 4-5). Interpretive research is also intended to increase understanding of human interpretations and meanings. However, it is also important to remember that a method may fit into many philosophical perspectives, as every research strategy has its own advantages and disadvantages, while strategy selection depends on the nature of the research topic and the goals of the researcher (Benbasat et al., 1987).

## 4.2 RESEARCH DESIGN

Since the stated aim of this research is to determine the enabling and inhibiting factors of insourcing a government IS, particularly in regards to development, implementation and maintenance; initial exploratory research will determine the research design, data collection method and selection of the subjects. Furthermore, exploratory research assists in locating a problem that has not been clearly defined, particularly because this research is more concerned with hypothesis development than hypothesis testing (Kothari, 2004).

This research attempts to address the 'how', 'why' and 'what' questions that enable the gathering of information from the case organisations and their stakeholders based on their experiences, opinions and organisations' actions that are 'rich' in personal comment and individual insights, gained through the use of in-depth interviews and observations. Exploratory research also helps the researcher to gather data from secondary sources, such as reviewing available literature or engaging in informal discussions with users, employees or management.

### 4.2.1 Research Methodology: The Qualitative Method

As already discussed, the objective of this research is to gain greater understanding about the insourcing of a government IS, which is a relatively recent

phenomenon in developing countries, especially in Malaysia. As there are currently a limited number of published papers about insourcing a government IS, a qualitative approach provides the most suitable method to use when exploring more about a topic or nature of a problem. The rationale behind selecting a qualitative approach lies in the goal to Identify ***what*** the enabling and inhibiting factors of insourcing a government IS are; and ***what*** they can influence in the Malaysian government via the implementation process over time. It is believed that a qualitative research approach will gather richer information and insight from the various stakeholders by enabling an in-depth analysis of ***why*** an organisation should insource the IS and ***how*** organisations change over time. This study focuses on the practice of insourcing government IS in public organisations and seeks to learn more about the factors, issues, and key challenges. It is already apparent that the complexities surrounding the practice of insourcing a government IS in public organisations require the acquisition of rich and deep empirical data to provide effective explanations, and such an in-depth investigation is best achieved using qualitative methods, as such a technique can provide a richness of data that also offers diversity in its data generating methods. Qualitative data offers the opportunity to build a holistic picture of the research problem, and a way of filling the gap in existing research, namely assessing insourcing a government IS. Finally, as this research is intended to gather empirical data that draws directly on individuals' experiences, perspectives, histories, behaviours, emotions and feelings, such data cannot be obtained by using mathematical or experimental operations.

### 4.2.2 Research Approach: The Case Study Approach

The interpretive case study research method adopts an empirical approach that focuses on human interpretations and meanings. Interpretive case studies allow the researcher to become directly involved in the process of data collection and data analysis, and to make frequent visits to the field site (Walsham, 1995). Creswell (2009) described the case study as "a strategy of enquiry in which the researcher explores in depth a system programme, event, activity, process or one or more individuals" (pp 15). The case study is intended to address the 'how,'

'what' and 'why' questions, and therefore the case study researcher needs to be more explicit about their research goals and methods (Yin, 2014).

A case study is not using experimental control or manipulation, and the boundaries of the phenomenon are not rigid. It also can employ multiple data collection techniques to gather detailed information from all participants (Benbasat et al., 1987). Neuman (2014) offers three reasons for conducting case study research: firstly, the researcher is very familiar with the in-depth detail of specific cases; secondly, the researcher can see the intricate details of social processes and cause-effect relationships that capture the complexity of social life; and thirdly, the researcher is able to prove the study complexity, multi-factor event/situation and the process that occurs over time more effectively. Table 4.1 summarises the characteristics of case study research used when considering the most suitable research strategy for this study.

| Characteristics of the case study | Research characteristics |
|---|---|
| A detailed investigation, with data collected over a period of time and in a given context (Hartley, 2004). | Suited to the research questions, requires a detailed understanding of processes, due to the rich, informative context. |
| Data collected from a single source is more detailed and comprehensive (Oates, 2005). | Face-to-face semi-structured interviews to encourage respondents to offer their views and opinions based on their experiences. |
| A case study is suitable for this research as it is studying a specific organisation, department and group of employees, which contain multiple variables of potential importance in understanding the phenomenon (Merriam, 1998). | This research specifically studies the HRMIS by the Malaysian government. |
| The researcher is directly involved in the process of data collection, data analysis and makes frequent visits to the field site over an extended period of time (Walsham 1995). | The researcher is directly involved in the process of data collection and data analysis. However, the researcher rarely visits the field site due to being located on a different continent. |
| The researcher can explore in depth a system programme, event, activity, process, or one or more individuals in the organisation, which can help the researcher to capture the richness of organisational behaviour (Gable, 1994). | The researcher had previously used the system being investigated and had a basic awareness of the factors and issues surrounding the system. |
| A case study approach is suitable to:<br>a) Find out 'what' is happening and to seek new ideas;<br>b) Find the answers to the 'how' and 'why' questions that portray a situation or phenomenon.<br>c) Seek an explanation for a problem (Runeson & Höst, 2009). | This research attempts to answer the following questions:<br>a) How can we determine the enabling and inhibiting factors of insourcing an IS in public organisations?<br>b) What are the factors that influence the success of insourced government ICT projects?<br>c) To what extent does insourcing a government IS have an impact on a public organisation? |
| The case study is an ideal methodology if there is a lack of knowledge, in order to obtain more information in a holistic and in-depth investigation (Collis & Hussey, 2009) . | There is a paucity of similar projects and limited published research about insourcing a government IS. |

Table 4.1: The Rationale of Adopting a Case Study

By analysing the characteristics of a case study and the specifics of this research, it is clear that the case study offers an appropriate research strategy for this research. This research consists of a single case study, and sources for data collection in Organisation A (see Section 4.3.1) managed HRMIS and had an understanding of the system development and implementation process. According to Yin (2014), there are five rationales for selecting a single-case design: a critical case (to determine the correct proposition or to test the theory); an extreme or

unusual case (deviating from everyday occurrences that can be connected to a large number of people); a common case (to capture the circumstances and conditions of an everyday situation); a revelatory case (to observe and analyse a phenomenon inaccessible the researcher); and a longitudinal case (same single case at two or more different points in time). Therefore, Yin suggests that single case study is appropriate if the objective of the research is to explore a previously un-researched subject.

### 4.2.3 Data Collection Methods: Interview and Review of Documents

Data collection is the most intense and time-consuming phase of case study development (Parikh, 2002), and therefore must be planned clearly and efficiently. According to Yin (2014), there are six sources of evidence commonly used in case study research: documentation, interviews, archival records, direct observation, participant observation and physical artefacts. Since the aim of this study is to explore and identify the enabling and inhibiting factors of insourcing a government IS from the various stakeholder perspectives, interviews and the review of relevant documents offer the best data collection techniques, and are commonly employed in an interpretive case study (Walsham, 1995).

According to Myers & Newman (2007), interviews are a powerful research tool when gathering data, and have been used extensively in IS research. Furthermore, they are the most widely used method in qualitative research to explore personal experiences (Valenzuela & Shrivastava, 2008), and therefore have been chosen as the data collection method for this study. Whilst there are a number of potential difficulties in the process of conducting interviews, all relevant measures have been taken to overcome them.

An interview can be conducted face-to-face or via the telephone, and can range from being in-depth or conversational; structured, semi-structured or unstructured, depending on the information being sought. The types of interviews described by Oates (2005) are:

a) Structured interviews: pre-determined, identical, and standardised questions, using pre-code answers or a limited number of response categories.

b) Semi-structured interviews: a list of themes or an interview guide containing open-ended questions defining the area to be explored. Interview questions can be changed depending on the flow of the conversation.
c) Unstructured/in-depth interviews: interviewer has less control and starts with a single question. The interviewee is able to respond freely and to develop their ideas about events, behaviours or beliefs, with the interviewer simply responding to points that seem worthy of being followed up.

Based on the definitions given above, the structured interview is not suitable for this research, because the questions will be asked in a specific area of study and the heavily controlled approach does not allow participants to properly share their opinions and experiences. Conversely, the unstructured interview approach provides researchers with no control over the interview, as participants are free to respond in any area, leading to data that is too broad to be analysed in any detail. Therefore, a face-to-face, open-ended, semi-structured interview has been selected as the most suitable this research, in order to provide understanding of the participants' experiences and opinions in determining the relevant factors, and to gain a detailed insight into the issues that affect government IS development and implementation in Malaysia. Table 4.2 offers the rationale behind adopting a semi-structured interview method in this research.

| Semi-Structured Interview | Research Approach |
|---|---|
| Encourage the interviewee to talk freely when answering questions and allow the researcher to be responsive to issues raised spontaneously by the interviewee (Ritchie et al., 2013). | This research aims to obtain direct information from people about their experiences, opinions, feelings and knowledge. |
| Based on the interview guide by defining the area and a clear list of issues to be explored with open-ended questions (Denscombe, 2010). | Open-ended interview questions allow participants to express their opinions, feelings and perceptions in areas wider than the interview guide. |
| By controlling the face-to-face environment (rather than by telephone), the interviewee can answer questions spontaneously, without extended reflection (Opdenakker, 2006). | The interviews will be conducted at the respondents' offices to make them more comfortable and to reduce background noise. |
| Encourage the interviewee to talk freely when answering questions, and allows the researcher to be responsive to the relevant issues raised spontaneously by the interviewee (Ritchie et al., 2013). | This research aims to gather direct evidence from people regarding their experiences, opinions, feelings and knowledge. |

Table 4.2: The Rationale Adopting of a Semi-Structured Interview

Interviews enable the gathering of in-depth opinions from interviewees who are knowledgeable about insourcing and other IS issues in the organisation. Each of the interviewees has been selected on the basis of their expertise, experience and involvement in the implementation of insourcing an IS.

As discussed in Section 4.2, an exploratory case study approach has been selected for this research, in order to investigate the context underpinning government information systems in the Malaysian government. The interview questions were designed from the perspective of institutions, capability and technology in order to investigate the cause and effect and interaction between these dimensions, in order to explore and study the potential for ICTs in government administration to beneficially affect institutions, and for ICTs to assist the development of internal staff capabilities, from the perspective of the public sector in Malaysia.

### 4.2.4 Analysis Technique: Using Grounded Theory Coding Principles

Two sociologists, Glaser and Strauss, provided the first definition of the grounded theory technique in 1967, describing it as "the discovery of theory from data" (Glaser & Strauss, 1967) (pp 1). Grounded theory is a research methodology that enables the researcher to develop inductive theories that in turn seek to develop a theory that is grounded in the data as it is systematically gathered and analysed (Myers, 1997). In addition, Denscombe (2010) suggests that the grounded theory methodology is relevant to IS research, with coding principles from grounded theory usually related to the analysis of interview transcripts as the data collection technique.

Grounded theory was developed in response to the need to conduct qualitative research in American health institutions regarding the care of terminally ill patients. The aim of grounded theory is to generate a theory based on the data collected from interviews or observations in order to interpret the experiences, lives and perspectives of respondents, as described by Glaser and Strauss: "generating a theory from data means that most hypotheses and concepts not only come from the data but are systematically worked out in relation to the data during

the course of the research" (Glaser & Strauss, 1967; pp. 6). However, this research is not intended to generate a theory, and the coding principles from grounded theory are used simply during the process of data analysis, and therefore follows the 'Glaserian' or classical grounded theory coding principles, where an interpretive viewpoint is used to find a core category, identifying something waiting for discovery, with an emphasis on transcending theories (Åge, 2011) and according to Stern (1994), is useful for studying a new area.

## 4.3 EMPIRICAL RESEARCH

The empirical research process is intended to ensure that the research design is implemented according to the research plan, in order to achieve the research aim and to answer the research questions.

This stage may also be labelled the research method, being the process of data collection and analysis in order to produce meaningful information. It is not only a procedure designed to gather data and analyse it, but also involves a combination of several intellectual, analytical and interpretive activities (Mason, 2002).

### 4.3.1 The Selection of the Research Site

The author of this study has worked for the Malaysian government for more than a decade, and as a consequence has developed an interest in the implementation of government information system that can assist the government in spending money wisely. An involvement in the government information system as a user has allowed for the identification of the most appropriate subjects for scrutiny, and facilitated the acquisition of the most relevant documents at the research sites.

Being a part of the culture within the Malaysian government administration has also aided understanding of both the people involved in the study and the wider organisation, which has speeded up the process of gaining access to the research sites and subjects. Adopting the role of 'insider' also provides an awareness of the culture of the organisation and the events taking place in regard to the implementation of the government information system, an advantage not readily available to outsiders. Malaysia is unique due to its diversity of races, religions and

cultures, which produces a complicated interaction by stakeholders, which form a complex combination of social, cultural, political and economic factors that need to be addressed.

As Malaysia moves towards the goal of becoming a fully developed nation by the year 2020, the Malaysian government has realised the importance of the adoption of information systems as a catalyst, a strategic weapon and providing a competitive advantage, and consequently in 1996, Malaysia introduced the Multimedia Super Corridor (MSC) project. Launched by the former Prime Minister, Tun Dr. Mahathir Mohamad, the project has dramatically increased the development of the country's IT industry and made Malaysia a model for other countries in South East Asia, including Brunei, Indonesia, Vietnam and Cambodia. As a result of this strategic focus, Malaysia was found to be the second leading country within the region of South East Asia on the e-Government Development Index in 2016; 12$^{th}$ in Asia as a whole (United Nations, 2016).

In addition, this research aims to improve the quality of service delivery within the public sector in Malaysia, as well as contributing improved knowledge and a better understanding of the subject of insourcing a government IS. It is believed that this study will significantly increase the effectiveness and efficiency of good governance and responsive government to the wider population, by providing better value services at a lower cost.

The system being examined for insourcing is a large government IS, known as HRMIS. HRMIS is a major human resource management system and a large IS in the Malaysian government, with approximately 650,000 active users from a total of 1.5 million civil servants (Woo, 2014). HRMIS has approximately 40 modules in the system, and each module represents a complete system by itself. HRMIS is managed by Organisation A, requiring a large database as it stores information on civil servants from the date of their appointment until the date of their leaving the service. In November 2011 the Malaysian government terminated the contract with the outsource vendor responsible for developing HRMIS from 22$^{nd}$ June 1999 until 31$^{st}$ October 2011. The vendor's contract was terminated because fundamental problems were left unresolved, including slow system response time,

high cost and a lack of user-friendliness. As a consequence, the implementation of insourcing an IS in the Malaysian government offers an excellent opportunity to further explore the benefits and challenges of insourcing in the public sector. Insourcing of a government information system provides a relatively new approach to system development and maintenance for the Malaysian government, driven by the termination of the outsourcing contract in November 2011.

Organisation A was selected as the focus for this research because it manages a large government human resource IS, and is responsible for the formulation of policies in relation to public service human resource management. Organisation B was chosen because it is an agency responsible for administrative modernisation and the transformation of public service delivery systems in the public sector, particularly focused on the implementation of ICT development, with the aim of strengthening service delivery in the Malaysian government.

### 4.3.2 Participants Selection

As previously discussed, face-to-face, semi-structured interviews were selected as the primary data gathering method in this research, designed to elicit the views, experiences and knowledge of key players in the insourced government ISs. The research participants were selected based upon their involvement in the process of government information system procurement, development and maintenance. In addition, a number of users of the system were also interviewed. Collectively, the research participants in this study are known as 'key informants'.

Each semi-structured interview was recorded, to allow for easy interaction between the researcher and participants, and allowing the researcher to concentrate on what was being said, rather than focusing on writing down every detail. Altogether, a total of 69 interviews were conducted. Table 4.3 shows the number of participants, arranged by category.

| | Organisations | Duration | Number of Participants |
|---|---|---|---|
| First Data Collection | Organisation A | 18th – 29th November 2013 | 20 |
| | Organisation B | 2nd – 13th December 2013 | 14 |
| | Users from various organisations[3] | 17th December 2013 – 8th January 2014 | 14 |
| Second Data Collection | Organisation A | 2nd – 20th March 2015 | 21 |
| **TOTAL** | | | **69** |

Table 4.3: The Number of Research Participants

As outlined above, HRMIS was selected as a case study for this research based on the characteristics of the system. HRMIS provides services to internal users, i.e. government servants, and not to the public, and therefore in this context, the term 'government IS' is the most appropriate.

In order to achieve data saturation, the preferred sample size depends upon the research approach adopted. According to Mason (2010), 20-30 is the most common sample size for case study research, and therefore 30 participants from Organisations A and B were selected for interview. In each organisation, there were eight participants selected from management and seven participants chosen from among the technical workers. In reality, the number of participants changed in each organisation on the interview day, due to participants' work commitments and availability.

Initially, the researcher did not intend to collect responses from the programmers and users of the government IS, although this design was subsequently changed in order to gather data from different perspectives. The programmers and users were selected using the convenience sampling technique, asking for volunteers amongst programmers from Organisation A, and users of government IS from the various government agencies. According to Marshall (1996), convenience sampling is a sampling technique that is easily accessible to the researcher and which can conserve time, money and effort. The number of participants in the programmer

[3] Details of participants are provided in Appendix 2.

group reached a total of five people, while the number of participants from the user group was 14. The interview guide used for the programmer group was similar to that used for the technical group. In the interview guide for the users of the system, the questions focused more on the strengths, weaknesses, challenges and possible improvements to the government IS.

The total list of participants in the first data collection period is shown in Table 4.4. This data collection phase was conducted in Klang Valley, Malaysia from November 2013 until January 2014. A total of 48 interviews were conducted.

| Organisation | Date | Interviewee Job Titles | No. |
|---|---|---|---|
| Organisation A, Cyberjaya, Malaysia | 18th – 29th November 2013 | Top Management | 1 |
| | | Senior Management Officers | 4 |
| | | Senior Technical Officers | 6 |
| | | Management Officers | 2 |
| | | Technical Officers | 2 |
| | | Programmers | 5 |
| Organisation B, Cyberjaya, Malaysia | 2nd – 13th December 2013 | Top Management | 2 |
| | | Senior Management Officers | 3 |
| | | Senior Technical Officers | 3 |
| | | Management Officers | 3 |
| | | Technical Officers | 3 |
| Various Organisations, Klang Valley, Malaysia | 17th December 2013 – 8th January 2014 | Director | 1 |
| | | Senior Management Officers | 3 |
| | | Management Officers | 3 |
| | | Teacher | 1 |
| | | State Officer | 1 |
| | | IT Technician | 1 |
| | | Assistant Officer | 1 |
| | | Clerks | 3 |
| **TOTAL** | | | **48** |

Table 4.4: Participating Organisations and Interviewee Job Titles.

The selection of stakeholders was designed to represent a cross section of Organisation A and Organisation B, including the Deputy Director, senior managers, senior management and technical officers, management and technical officers; as well as users of the government IS drawn from various government agencies. There were three sets of interview guides (attached at Appendix 3), designed to elicit the perspectives from the following cohorts:

a) Organisational staff and managers (institutional perspective)

b) Technical staff, programmers and managers (technical perspective)
c) Stakeholders (users, including state officers, teachers, and organisational staff) (capability perspective)

The purpose of the second data collection period was to investigate whether the implementation of insourcing was continuing, and therefore, participants from management and technical divisions were selected, who were involved directly in the development, maintenance and implementation of HRMIS; with the aim of gathering the most accurate information, and different participants were interviewed in the second data collection phase. The second data collection period was conducted during March 2015, and focused only on Organisation A. The number of participants was set at 20, with eight from the management group, seven from the technical group and five from the programmer group. In reality, the final number of participants changed, as once again some staff declined to participate at the last minute due to work commitments. These individuals were replaced, and the number of participants in each group then changed, with the addition of another volunteer gained from the management group.

Data was gathered from a central government agency in Putrajaya, Malaysia, via a total of 21 semi-structured face-to-face interviews. Four participants were drawn from the management group, ten from the technical group, and six from the programmer group. Table 4.5 provides the final list of participants in the second phase of data collection.

| Organisation | Date | Interviewee Job Titles | No. |
|---|---|---|---|
| Organisation A, Putrajaya, Malaysia | 20th Mar 2015 | Director | 1 |
| | 5th Mar 2015 | Senior Technical Officer | 1 |
| | 2nd & 3rd Mar 2015 | Senior Management Officers | 2 |
| | 2nd – 5th Mar 2015 | Senior System Analysts | 5 |
| | 2nd Mar 2015 | Management Officers | 2 |
| | 2nd Mar 2015 | Technical Officers | 2 |
| | 4th Mar 2015 | Senior Programmer | 1 |
| | 4th Mar 2015 | Assistant Technical Officers | 2 |
| | 2nd – 5th Mar 2015 | Programmers | 5 |
| **TOTAL** | | | **21** |

Table 4.5: Participants in the Second Phase of Data Collection

### 4.3.3 Data Collection

There were two data collection techniques adopted in this research: face-to-face, open-ended, semi-structured interviews; and document reviews. 69 semi-structured interviews were carried out in total, conducted in two phases; 48 interviews from the first data collection period; and 21 interviews from the second data collection period, as shown in Table 4.6. A further breakdown of respondents by group is provided in Table 4.7.

| No. | Interview Period | Data Collection Period | Number of Participants |
|---|---|---|---|
| 1. | November 2013 until January 2014 | First | 48 |
| 2. | March 2015 | Second | 21 |
| **TOTAL** | | | **69** |

Table 4.6: Data Collection Periods

| No. | Groups | Number of Participants |
|---|---|---|
| 1. | Management | 19 |
| 2. | Technical | 25 |
| 3. | Programmers | 11 |
| 4. | Users | 14 |
| **TOTAL** | | **69** |

Table 4.7: Breakdown of Respondents by Group

The interview guides for each interview were prepared in advance, and each data collection session had a different interview guide, with amendments made to the interview guide used for the first data collection period in order to ensure that the interview questions were applicable to answer the research questions. Table 4.8 links the research questions to the appropriate data sources and data collection techniques.

| Research Questions | Data Gathering Techniques | Data Sources |
|---|---|---|
| How can we determine the enabling and inhibiting factors of insourcing an IS in public organisation? | Interview | Research participants |
| What are the factors that influence the success of insourced government ICT projects? | Interview<br>Review of documents | Research participants<br>Documents |
| To what extent does insourcing a government IS have an impact on a public organisation? | Interview<br>Review of documents | Research participants<br>Documents |

Table 4.8: Appropriate Data Gathering Techniques and Sources based on the Research Questions

Interviews were conducted with civil servants from two government agencies in Malaysia. In order to facilitate these interviews, contact was made via email and telephone in order to obtain the necessary permission and make arrangements with designated officers. This initial contact was followed up with a letter outlining the background and nature of the research. Before the main body of investigation took place, preliminary research was undertaken in February 2013 at the government agencies concerned, in the form of personal visits and discussions with directors and senior managers in the specific divisions.

After the preliminary research episode, follow-up telephone calls and emails to the designated officers in both organisations were made to enquire about potential interview participants. Once the process of identifying the respondents was complete, a list of agreed research participants was sent to the researcher via email. This process began some two months before fieldwork commenced, and continued until all interviews were complete. Interviews were conducted in the participants' own organisations, with the aim of gathering their opinions and gaining a greater understanding of the practice and implementation of the government IS. Interviews surveyed a range of topics, including the issues, factors, benefits and challenges associated with insourcing a government IS, as well as determining future requirements. A dedicated room was allocated for the interviews in both Organisations A and B.

Open-ended questions were posed during the interviews, intended to gather as much information as possible; and all interviews were conducted on a one-to-one

and face-to-face. As suggested by Creswell (2013) and Denscombe (2010), the observational and analytical skills required during the interview process depend wholly on the ability of the interviewer to balance the art of asking and listening to the interview. All interviews were recorded on an audio recorder, once respondents had given their consent.

Before each interview, the recording device was tested for quality, and interview sessions were also conducted with minimum background noise. All audio recordings were immediately uploaded onto a computer after the interview session, and interviews were transcribed.

The interview guide was prepared in English, as this thesis is written in English. The initial plan was to conduct interviews in English, but this was subsequently changed; as whilst it is common for Malaysians to be versed in several languages (because the Malaysian community is multiracial and multilingual), with most Malaysians (more than 50 per cent) able to converse in at least two languages, the Malay language is the main language of communication in the public sector, and most respondents answered in the Malay language. The national language of Malaysia is Malay or *Bahasa Malaysia,* with English considered a racially neutral language. In everyday conversation, most Malaysians are comfortable speaking a mix of English and the Malay language, In the course of these interviews it was interesting to note that the most senior staff answered in a mix of languages as a matter of course, reflecting their strong English language skills.

The interview guide for the first phase of data collection drew on institutional theory, the capability approach and technology, to reflect the analytical framework outlined in Chapter Three. The interview guide for the management group placed more emphasis on institutions and the capability approach, while that prepared for the technical group placed greater emphasis on the capability approach and technology. Since the selection of participants from group of programmers was undertaken at random, the same interview guide was used as for the technical group. However, the interview guide produced for the user group was revised to place more emphasis on the capability approach and strengths, weaknesses and system performance.

The interview guide for the second data collection phase (attached at Appendix 4) was designed based on the OPTIMISM dimensions (Bass & Heeks, 2011), explained in detail in Chapter 3.

### 4.3.4 Secondary Data Sources

In addition to the interviews undertaken with the Malaysian civil servants as a primary data source, secondary data in the form of documents relating to the implementation of insourcing and HRMIS were also analysed. A wide range of documents including government policies, annual reports, reports, prospectuses and public announcements were reviewed in order to identify the different aspects of HRMIS. Secondary data can take the form of quotes or entire passages drawn from organisational or programme records; memoranda and correspondence; as well as official publications and reports (Patton, 2002); and may also include letters, email correspondence, journals, branch literature and brochures as well as news clippings and articles appearing in the mass media (Yin, 2014).

### 4.3.5 Data Analysis

Analysis is fundamental to understanding and interpreting the data. Yin (2014) expounds that "the process of data analysis is to produce empirically based findings from the data collected, which involves examining, categorising, tabulating, testing or otherwise recombining the data" (pp 18). Miles et al. (2013) further indicate that qualitative case data analysis is a complex task, as the methods and approaches are often not well formulated.

Therefore, a recorded interview should be transcribed, reviewed, analysed and coded (Patton, 2002), before being subjected to an iterative multi-step data analysis progress. This data analysis process is an art, which is unique for each research study, and which requires a high degree of intellectual ability, including creativity and analytical thinking, because it is interrelated with data collection and report writing (Creswell, 2013). In this study, the data analysis process focused on deriving the meaning of the text from each interview transcript. The data collected from the semi-structured interviews were analysed using Glaserian

grounded theory coding principles, using categories, codes, memos and constant comparison (Glaser & Strauss, 1967).

### *(i) Transcription Process*

The process of transcribing audio recordings commenced immediately after each face-to-face interview was concluded. Raw data consisting of direct quotations from the interview in the audio format was carefully transcribed and transformed into readable and printable texts. The audio recordings were listened to many times and the transcripts inspected for errors to ensure their accuracy.

The transcription process was particularly time consuming given the number of interviews undertaken (69) and the language differences that they contained. As previously discussed, the interviews were conducted in the vernacular, either Malay or a mixture of Malay and English. Out of 69 interviews conducted in Malaysia, only one interview was conducted fully in English, with the rest a mixture of English and Malay. All the interviews were transcribed in the UK, and the transcription of the interviews was undertaken in the language spoken by the respondents: for example, if the interview was conducted in Malay, then the interview was transcribed in Malay; if the interview was conducted in a mixture of English and Malay, the interview was transcribed in the same mixture of English and Malay; and if the interview was conducted fully in English, then the interview was transcribed in English. Some of the transcripts from the first data collection period were discussed with 19 of the original respondents in face-to-face meetings during the second data collection phase, to gain further information and also to seek participants' approval for the transcript, in order to increase the validity and reliability of the data.

Once the transcription process was complete, the interview transcripts were organised and sorted according to the respondents' roles, e.g. managerial staff, technical staff, programmers and users; each with a unique code known only to the researcher. At this point, all interview transcripts were read through before the process of coding commenced. As reading began, the ideas, comments and identification of possible codes and patterns were written in a blank column on the right-hand side margin of every page of the transcript; and were highlighted in

yellow on the interview transcript. This process was carried out a number of times in order to identify and indicate patterns contained in the data, before all the data were examined closely and compared for relationships, similarities and differences.

### *(ii) Open Coding*

Open coding was used in this research, with the transcribed texts examined by making comparisons and asking questions (Graham, 2008). Open coding begins by analysing key points from each interview transcript and then assigns a code (a phrase) to summarise the key points. Using open coding, the data can be read several times and then appropriate labels or 'codes' will be assigned to different parts of the data, allowing common properties to be allocated to the same concept or phenomenon. Subsequently, the data was further processed, breaking it down into pieces and examined closely for relationships, similarities and differences in the transcripts. The codes were grouped together and placed in categories based on their common properties if the codes recurred and there were similarities. By using this process of open coding, the interview transcripts were analysed line-by-line.

> Strauss and Corbin (1998) explain how issues can be derived from data that for phenomena. These phenomena are then assigned a conceptual label to a code, also known as a concept. Categories are then identified from some or concepts that share the same or similar characteristics that can typically interlinked and build the basis of a theory. Adapted from Strauss and Corbin (1998), the process of coding an interview and developing a theory is depicted in a simplified form in

Figure 4.1. Drawing on the data after coding the interview transcripts, it became clear that there were many issues that respondents regarded as important.

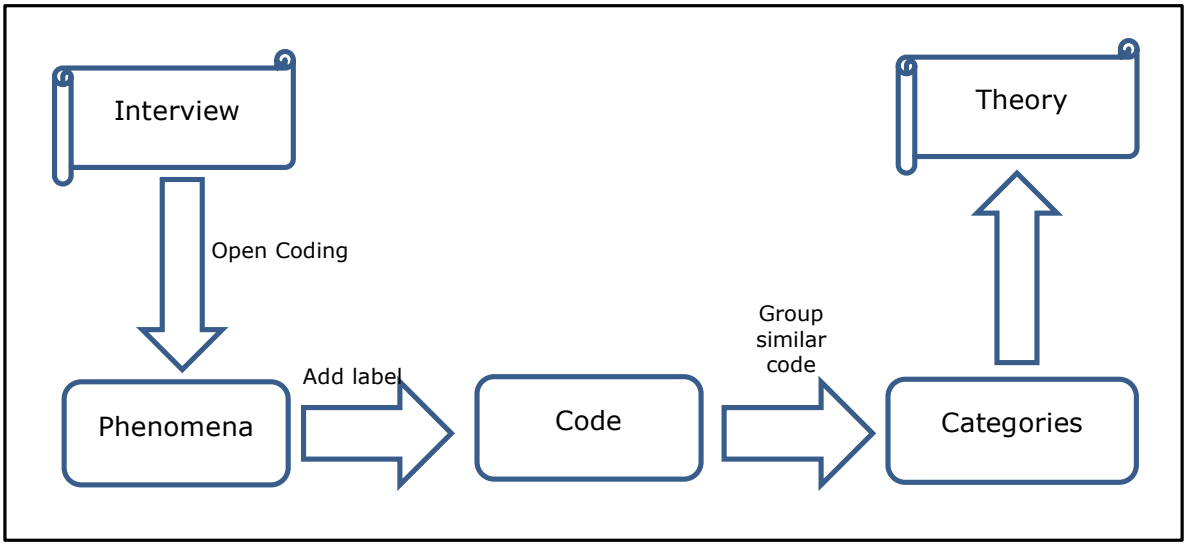


Figure 4.1: Steps of the Coding Principles from Grounded Theory (Source: Strauss & Corbin, 1998)

### *(iii) Memoing*

Memos are created in order to explain the conceptual and theoretical ideas that emerge from the analysis (Walker & Myrick, 2006). A memo is created if a name with a few words is not enough to describe the concept underpinning the conceptual and theoretical ideas that emerge from the analysis. Memoing is an iterative process that attempts to operationalise definitions and questions, posing hypotheses and providing answers as revealed in the data. As Charmaz (2006) states, memoing helps the researcher to analyse the data and codes early in the research process and can keep the researcher involved in the analysis and increase the level of abstraction of the ideas. Figure 4.2 provides an example of a memo on the "skills of an IT officer".

> The skills of IT officer in the government sector play an important role in ensuring that the system can be developed within the time frame and budget. The IT officer must have up-to-date skills and knowledge, as it can help to increase the number of system experts in the government and can reduce dependency on the vendor. The skills enhancement of the IT officer will make the process of system development and maintenance easier because they understand the system better than the vendor, as they are also users of the system. Systematic and on-going training should be developed in order to enhance the skills of the IT officer especially in regard to user requirements, analysis, design, programming skill and project management.

Figure 4.2: A Memo on Competencies of the Officer

Memoing aims to record the ideas and thoughts that develop during the coding process. It also can note the emerging relationships between different concepts and categories, by identifying the similarities and differences between them, and how they affect each other. Glaser's definition of a memo is widely used:

> A memo is the theorising write-up of ideas about codes and their relationship as they strike the analyst while coding... it can be a sentence, a paragraph or a few pages... it exhausts the analysts' momentary ideation based on data with perhaps a little conceptual elaboration (Miles et al., (2013) (pp 83-84).

### *(iv) Constant Comparison*

The method of constant comparison is a continual and on-going procedure where the data is compared and contrasted and theories are formed, enhanced, confirmed or even discounted as a result of any new data emerging from the study (Strauss & Corbin, 1998) . In order to produce a high level of data abstraction, codes that arise from each interview transcription are constantly compared with the codes from the same interview and other interviews. This is an interactive process, allowing all the issues to be grouped into categories representing common themes. As Denscombe (2010) states, constant comparison helps the researcher to refine the codes, categories, and concepts by highlighting the similarities and differences that exist and promoting better categories and descriptions); integrating categories and codes under common headings and thereby facilitating the reduction of complex phenomenon to simpler elements; and checking developing theories as they emerge, incorporating a way to vary or refute them at an early stage, rather than after the event.

Figure 4.3 shows an example of the emergence of a category from underlying concepts.

**Concept:** Large system

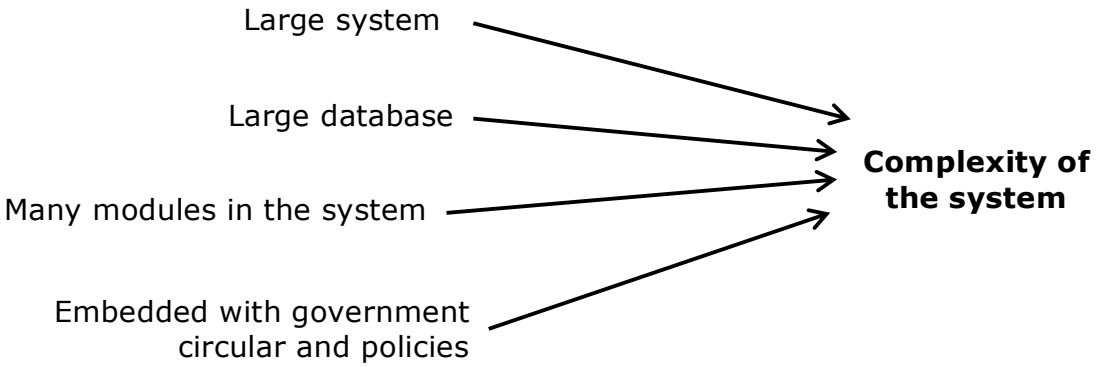


Figure 4.3: Example of the Emergence of a Category from Underlying Concepts

Other concepts that emerged included:

- A large database.
- Many modules in the system.
- Embedded with government circulars and policies.

Finally, constant comparisons were repeated on concepts to produce the third level of abstraction, known as categories.

**Category:** Complexity of the System

Table 4.9 summarises the key points and codes generated from selected interview transcripts of the first data collection phase; and Table 4.10 refers to selected interview transcripts from the second phase of data collection. Detailed data analysis is provided in Appendix 5.

| Interview Quotations | Codes | Concepts |
|---|---|---|
| [Respondent1]: "*The system is too complex*"<br>[Respondent5]: *"Any changes in the circulars or policies, we have to change the process in HRMIS accordingly"*<br>[Respondent34]: "*Now HRMIS is web-based with a large database*" | Large system<br>Large data<br>Many modules<br>Embedded with government circulars and policies | Complexity of the system |

Table 4.9: A Preview of the Key-Points and Codes (First Data Collection)

| Interview Quotations | Codes | Concepts |
|---|---|---|
| *"It will be based on a project, not based on unit or section. His (new director) concept, if there is a project; gather all the people from every unit… form as a team"* [Interviewee3]<br>*"It (project-based approach) creates accountability for everyone because you have a specific role"* [Interviewee6]<br>*"In term of system development, of course, it must have a team, not in a silo"* [Interviewee10] | Project based approach<br><br>Work as a team<br><br>Work in silo | Management style |

Table 4.10: A Preview of the Key-Points and Codes (Second Data Collection)

## 4.4 TRANSCRIPTION AND TRANSLATION

69 interviews were conducted in the course of this research. 48 interviews were conducted in the first data collection period, with 21 conducted in the second. As discussed above, of the 69 interviews, 68 interviews were conducted in the Malay language or in a mixture of English and Malay, with only one conducted in English, and all the interviews were transcribed according to the language spoken by the respondents. The resulting data has been coded and categorised in English, as the researcher is bilingual. The average interview lasted between 30 and 45 minutes.

As asserted by Yin (2014), a role of the qualitative researcher is to minimise bias in the research, and therefore, the interview transcriptions in Malay and English were sent to two Malaysian PhD students based at the University of Reading and the University of Aberdeen for checking, in order to reduce bias and increase its validity and reliability. The two PhD students were asked to read the interviews and see if any clarification or corrections needed to be made. They found that some of the interview quotes need to be improved and revised, based on the feedback from others students. An extract from the interview transcripts is attached in Appendix 6.

Every audio interview was kept as a backup in the researcher's password-protected personal computer, and the audio interviews were also stored on the university's server under the researcher's name with a password that could only be accessed by the researcher.

## 4.5 ETHICAL CONSIDERATIONS

The researcher in any study must identify and take responsibility for any ethical consequences arising from involvement in qualitative research. Ethical clearance is required in relation to integrity, confidentiality and anonymity while conducting a research study. This research obtained ethical clearance from Robert Gordon University upon completion of a Research Ethics: Student and Supervisor Appraisal (RESSA) form before the process of data collection commenced.

This study was granted consent from the Economic Planning Unit (EPU) in Malaysia before data collection began, meeting the regulations set out by the EPU in 2014 that all Malaysian nationals attached to overseas institutions must obtain approval in advance before research can be conducted in the Malaysian government agencies.

The data gathered during the interview process was treated as confidential and kept securely on the University's server under the researcher's name and secured by a password to protect participants' privacy and identity. Maintaining the confidentiality of data ensured the research's integrity, the research participants' privacy, and ensured that any sensitive information obtained could be used for purely academic purposes.

Agreement to participate was obtained from all the research participants before any information was published, and a consent form (Appendix 7) was provided to each individual at the beginning of each interview. The participants were properly informed before participating in research about the ethical standards being met, along with any possible harms or risks that could potentially arise.

## 4.6 RELIABILITY AND VALIDITY

According to Merriam (1998), there are three principles to be tested when checking the quality of research: reliability, validity and generalizability. Reliability refers to the extent to which future research would generate consistent results by using the same instruments. Research achieving high levels of reliability provides similar results when further studies are undertaken using the same research methods under similar conditions. However, over time, the reliability of research cannot be guaranteed even if its measures have high validity (Neuman, 2014) ; due to rapid changes in regulations, technologies and communication channels that are likely to affect the research process.

According to Merriam (1998), the argument of generalizability must be framed within the purpose of the qualitative collection of data, a purpose related to building a theoretical framework based on the attitudes of a purposively selected sample about a specific research question. Therefore, qualitative data are generalizable only to the theoretical framework, and not to some elusive target population (Merriam, 1998).

Creswell & Miller (2000) claim that the purpose of validity is to ensure that research is free from any bias regarding the outcome, and that the researcher has fulfilled all the necessary requirements, based on the original objectives and purposes underlying the research. The expected results of the research should be true, and it is preferable if the validity of the research is evaluated at the end of the analysis phase. In this study, the researcher contacted 19 respondents via telephone calls and also met some participants face to face (during the second data collection) in order to obtain their feedback on the analysis thus far, and to reduce the likelihood of misinterpretation of their opinions.

In order to ensure the reliability and validity of this research, a pilot study was undertaken at an early stage. A pilot study allows the researcher to practice conducting research and to refine the research design, procedures, data collection techniques and subsequent analysis.

14 system users were also interviewed to obtain their perspectives, opinions and experience in order to undergo the process of triangulation. The process of data gathering in the field was enhanced by undertaking an additional data collection phase evidence to further ensure the validity and reliability of the research, as suggested by Merriam (1998), Creswell & Miller (2000) and Robson (2011).

## 4.7 SUMMARY OF CHAPTER AND CONCLUSIONS

This chapter outlines the research methodology employed in this study. For the purposes of this research, a qualitative research method was selected, adopting an interpretive perspective and employing semi-structured, open-ended interviews with 69 government servants in Malaysia, gathered during two series of data collection. Malaysia was selected for this research because of the Government's emphasis on ICT and the researcher's personal experience and expertise. Further, there was clear potential to perform a detailed research study of the development and maintenance of a government IS after the termination of an outsourcing vendor's contract. The selected case study, the modality adopted for data analysis, and the process of transcription and translation were also presented in this chapter. Finally, ethical considerations and the reliability and validity of the research were taken into account to ensure the research is viable.

# CHAPTER 5: FINDINGS

## 5. INTRODUCTION

Following the research methods described in Chapter Four, the concepts and categories that have emerged from the data must be mapped to the analytical framework. The analytical framework is designed to investigate how institutions recommend the insourcing of a government IS, according to their cultural, social and institutional features. It is also used to explore how the capability approach has influenced individual capabilities and their welfare; and also highlights the influence of institutional theory on social and organisational factors.

The OPTIMISM model has been adopted as a method of analysis, in order to explore the implementation of an insourced government information system. The analytical framework and the OPTIMISM model have been combined in order to analyse and evaluate the development and implementation of an information system in the Malaysian government, through the domain of institutions, capabilities and ICTs. This evaluation draws upon the interaction of the exciters and the inhibitors, by which the modified analytical framework has helped to identify the enabling and inhibiting factors in the implementation of insourcing a government IS.

The data presented here was collected using the Framework presented in Chapter Three. The data from both phases of collection was analysed together, incorporating seven exciters and six inhibitors that were derived from the analytical framework. The exciters are (i) resources for training, (ii) management skills, (iii) technical training for HRMIS technologies, (iv) creating a pool of programmers, (v) quality of services, (vi) data centralisation, and (vii) government support for network infrastructure. The inhibitors are (i) lack of recognition, (ii) negative user perceptions, (iii) lack of Java expertise, (iv) lack of infrastructure to support user access, (v) system complexity, and (vi) government regulatory policies.

Based on these exciters and inhibitors, it is possible to deduce that the objectives and values of the OPTIMISM model in Dimension A can be linked with a lack of

recognition and negative user perceptions, with staff situated at different levels of the organisational hierarchy often possessing very different views regarding the development, implementation and value of the information system, with managers and directors commonly viewing the information system as offering them greater control to monitor work, improve efficiency, and obtain the data necessary for generating reports. Reward systems also can be implemented, by enabling the provision of different incentives for different staff, to praise and acknowledge a job well done in order to boost morale and motivation.

The processes dimension of the OPTIMISM model found in Dimension C acts in a similar way to government regulatory policies: as an inhibitor, more related to the software development and procurement process. The system development process is a systematic approach to developing a flexible and efficient system, essential for developers planning, analysing, designing, testing and implementing the system. In this study, the process of system development also involved the procurement of the ICT equipment, software licenses and servers necessary to ensure that the development and implementation of information systems ran smoothly. Therefore, it is clear that the decision-making process in the public sector also played an important role in enabling the successful implementation of government information systems.

The technology dimension of the OPTIMISM model in the technology domain refers to the software, hardware and network technology that is vital in supporting user access to the system, including network connectivity, network bandwidth, ICTs equipment and high specification personal computers. The development of information systems must also meet the demands of current technology. Most importantly the system must fit the organisation's strategies and objectives, and be implemented successfully. To this end, the organisation should provide high speed Internet as a core infrastructure for public service delivery, and make all government services available online. However, the complexity of both new and existing systems, including its size, the large amount of data it contains, old versions of programming languages, multiple modules and a reliance on obsolete technology can all result in system integration and migration proving difficult to implement.

The information dimension of the OPTIMISM model in the technology domain can also influence the process of system development and implementation. In the case study, all information concerning civil servants is stored in a centralised system, which enables the government to monitor and manage the information about civil servants from a single source, thus maximising data integrity and minimising data redundancy. This may also provide accurate information regarding IT skills and related activities in the staffing cycle. In addition, information can also be gathered about the current state of technology, enabling to managers to prioritise new technology acquisition appropriately. In summary, it helps the organisation to plan its human resources strategy more effectively and efficiently.

The management structure and systems dimension of the OPTIMISM model concerns government regulatory policy in the institutions domain. The structures and systems of a public organisation are different from those in the private sector; with the fundamental objective the public sector to serve the people of the country, whereas the overarching goal of a private sector organisation is to generate more profit. Consequently, the government must design, formulate and regulate the policies and regulations that are necessary to secure the safety and well being of citizens and the sovereignty of the country's border. In this context, the three pillars of institutional theory, normative, regulative and cultural cognitive, can be implemented by using the 'top-down' approach in the organisation structure.

The investment resources dimension of the OPTIMISM model located in the institutions domain are related to the financial and time resources that must be provided an organisation, of which the budget is an essential element to ensure success. The successful planning and allocation of resources can also help the government to plan and develop a proper training programme to enhance the knowledge and skills of IT officers responsible for systems development and maintenance. In the Malaysian government context, the budget for systems development consists of separate development and operating budgets.

The staffing and skills dimension of the OPTIMISM model in the capabilities domain is related to capabilities and functionings of the staff in an organisation. The

organisation should provide the appropriate organisational environment for recruiting and retaining highly skilled IT and technical staff by providing clear career paths and meeting their personal aspirations. IT and technical staff in the organisation should be provided with the necessary technical skills in programming, and managing the servers, networking requirements, and wider software development; along with management skills in procurement, budgeting, human resources, and time management; and soft skills such as report writing, team working, public speaking, project management, and developing interpersonal relationships. Such skills can be derived through knowledge sharing, Training of Trainers (ToT), experience sharing, and workplace training, and also can be integrated into the wider occupational culture.

The milieu dimension of the OPTIMISM model in the institutions domain is an external factor in the process of system development and implementation. As an external factor that can shape the organisational environment, the milieu can influence the wider government decision-making process, and can prove effective in providing network infrastructure, including network connectivity, improving network bandwidth and providing network facilities, as a result of political, economic, socio-cultural, technological and legal intervention.

The usability and utility component of Dimension B is related to the quality of the service provided by the system, which in turn is affected by the technology and capabilities domains. Quality of service relates to stakeholders' expectations, especially from service users, who rightly demand that the system must be easy to use, be responsive and prove trustworthy and reliable. Therefore, feedback from respondents alerting management to issues of poor systems performance, slow response times, and single web browsers can help to improve the quality of existing systems by enhancing the coding structure, development of online systems, the installation of multiple access web browsers and web-based systems.

This chapter[4] will define the exciters and inhibitors to be mapped to the analytical framework, with the influences or effects either positive or negative on all the dimensions of the analytical framework. A positive influence is referred to as an exciter, and a negative influence as an inhibitor. The research findings presented here are the result of two series of data collection, where there are seven exciters, and six inhibitors. The details of exciters and inhibitors are divided into three dimensions: institutions – capabilities (Dimension A), capabilities – technology (Dimension B) and institutions – technology (Dimension C) that will be explained further in the next section. The combination of data collection results in the analytical framework is shown in Figure 5.1.

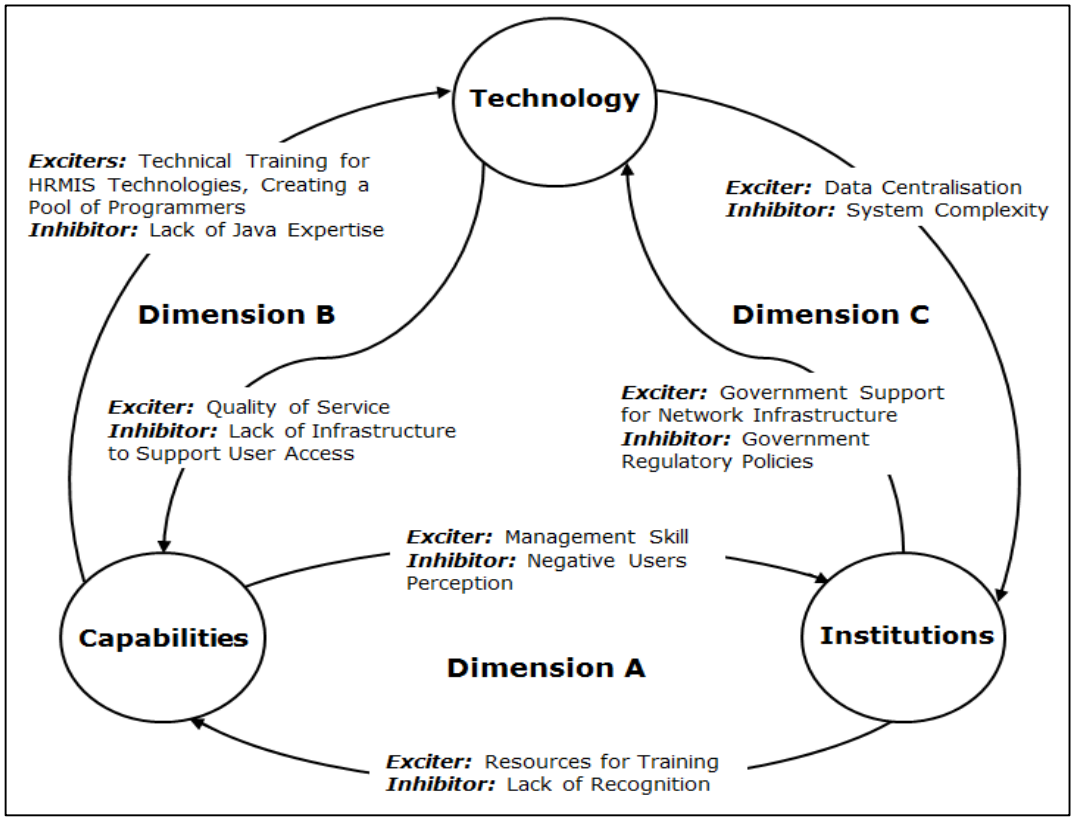


Figure 5.1: The Exciters and Inhibitors in All Dimensions (Adapted from Bass et al. (2013))

[4]Part of this chapter was been presented at the 13th International Conference on Social Implications in Developing Countries, Negombo, Sri Lanka from 20th – 22nd May, 2015 organised by IFIP WG9.4: Social Implications of Computers in Developing Countries and the International Conference on Information Society (I-Society 2015), Technical Co-Sponsored by IEEE UK/RI Computer Chapter in London, United Kingdom from 9th – 11th November, 2015.

## 5.1 INSTITUTIONS – CAPABILITIES (DIMENSION A)

Figure 5.2 highlights two exciters and two inhibitors in Dimension A, to demonstrate the interaction between institutions and capabilities. This dimension also shows the interaction between objectives and values; investment resources, milieu and management structures and systems (in the institutions domain); and the staffing and skills dimension (in the capabilities domain) of the OPTIMISM model. The exciters in this Figure are resources for training (institutions → capabilities) and management skills (capabilities → institutions). The inhibitors are a lack of recognition (institutions → capabilities) and negative user perceptions (capabilities → institutions).

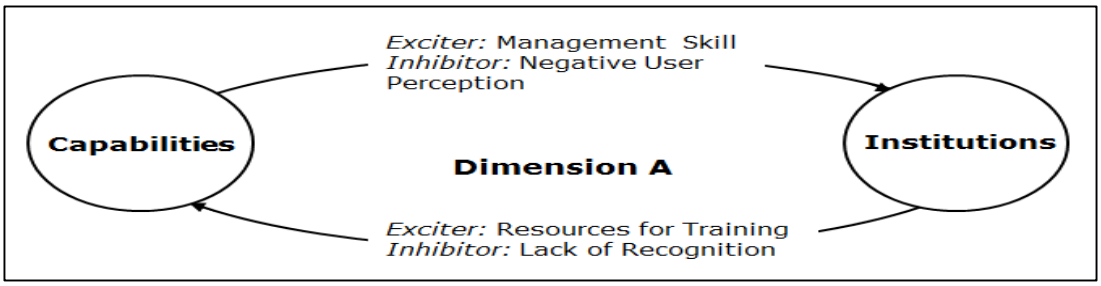


Figure 5.2: The Exciters and Inhibitors in Dimension A

### 5.1.1 Training resources

The provision of training helps enable IT officers develop their knowledge and skills in systems development and maintenance. Respondents in this study reported that the government provides sufficient financial resources to manage their HRMIS training needs. Resources for HRMIS training are allocated under the Development Budget[5], which is assigned for systems development, implementation, testing, training and maintenance. This is demonstrated in the following statements from four respondents:

> *There is no problem for HRMIS to get a budget from the government… some provision has been allocated for HRMIS training.*

**Respondent 1 (Senior Management Officer, Organisation A, November 2013)**

[5] Development Budget is the approved allocation for the Five Year Development Plan for various development programmes or projects being distributed according to priorities under the plan period (EPU, 2013).

> *We [Organisation A] can always get an allocation because HRMIS is [located] under [the] development budget…this allocation includes… HRMIS training in technical and management.*

**Respondent 16 (Senior Technical Officer, Organisation A, November 2013)**

> *We [Organisation A] have the allocation for HRMIS next year under [the] development budget… the allocation covers system development, maintenance and training.*

**Respondent 5 (Deputy Director, Organisation A, November 2013)**

> *My [budget] allocation is mostly for management training.*

**Respondent 4 (Senior Management Officer, Organisation A, November 2013)**

However, the current allocation provided by the government may eventually may prove insufficient, because the entire process of system development, implementation and maintenance, including the purchase of servers and software licences will be managed by an internal IT officer. This was illustrated by two respondents:

> *The government has provided an allocation for HRMIS, but the allocation also for the purchase and upgrading of servers and software licenses that we need to do after the vendor [contract] is terminated.*

**Respondent 8 (Senior Technical Officer, Organisation A, November 2013)**

> *The government need to review the allocation given to the agency because the agency needs more allocation to develop, implement and maintain the system. This is because all the processes will be done internally.*

**Respondent 13 (Senior Technical Officer, Organisation B, December 2013)**

The Malaysian government has provided a training portal consisting of 346 public training institutes known as 1MTC (1Malaysia Training Centres), to encourage civil servants to attend training sessions. Most IT officers receive their training from the National Institute of Public Administration (INTAN), to enhance their skills and

knowledge. This was demonstrated in the statements of the following five respondents:

> *All 346 agencies will update the information about courses and facilities in the portal and it's open to all.*

**Respondent 13 (Senior Management Officer, Organisation B, December 2013)**

> *There are many courses and training provided by INTAN. Normally, IT officers will get the relevant courses from INTAN such as database management, networking, and programming languages.*

**Respondent 31 (Senior Programmer, Organisation A, November 2013)**

> *I was given training on Java, framework and database related to Open Source, Postgres and Oracle from INTAN.*

**Respondent 17 (Technical Officer, Organisation A, November 2013)**

> *I have attended certified course… for system testing... Certified Tester Foundation Level (CTFL).*

**Respondent 18 (Senior Technical Officer, Organisation A, November 2013)**

> *The courses and training provided by INTAN is relevant with current technologies because we have a collaboration with Microsoft Incorporation.*

**Respondent 23 (Deputy Director [Management], Organisation B, December 2013)**

These findings reveal that the Malaysian government has provided sufficient budgetary allocation for staff training. These resources are used to create more experts and high quality officers, and to increase the overall success of the organisation. The provision of training resources is an exciter from the institutional domain, where the capabilities and functionings of staff members is being developed.

### 5.1.2 Management Skills

Management skills are an important element of career development for all staff. They can help employees (particularly senior members) to enhance their communication, leadership and presentation skills; skills which in turn will enable

them to communicate more effectively and thus motivate their colleagues and subordinates in the organisation.

The findings indicate that the management skills of IT officers are directly related to financial management, human resources, stress and time management. This can be seen in the following three statements:

> *It is important for us to attend a procurement course because we can learn the government's procurement process and enhance our skills in procurement management… it also helps us to plan to purchase ICT equipment, hardware or software in the future.*

**Respondent 15 (Senior Management Officer, Organisation B, December 2013)**

> *It is important to us to improve our management skills… that's why other than technical training, we will go for management courses, like financial management, procurement and stress management.*

**Respondent 18 (Senior Technical Officer, Organisation A, November 2013)**

> *We also attend for management courses, mostly for the human resources, stress and time management… it helps us to improve our management skills especially for senior officers to manage the subordinates.*

**Respondent 31 (Senior Developer, Organisation A, November 2013)**

When in-depth questions were posed regarding the type of management skills that were lacking, the statements from two respondents indicated a lack of project management skills:

> *The most important that I can see is project management, especially for HRMIS because HRMIS is a large system… if we lack project management skills, then the failure rate would be higher.*

**Respondent 21 (Technical Officer, Organisation A, November 2013)**

> *The planning of ICT project development is very good, we can see the objectives and direction what the government plans to do, but in terms of project implementation, it is quite bad. Maybe because [we are] lacking in project management skills.*

**Respondent 27 (Technical Officer, Organisation A, November 2013*)***

The high expectations from stakeholders make it necessary for civil servants, especially senior officers, to increase their management skills. This can be seen in two responses from IT officers:

> *When they get promoted to a higher position, then there is no problem for them to perform the given job if they are equipped with good management skills. But, if the person only concentrates on technical, and not on the management, when they get promoted to be a Head of Unit or a higher position, it will affect their performance.*

**Respondent 58 (Senior System Analyst, Organisation A, March 2015)**

> *In the government organisation structure, the assumption is that when you are in a higher position, your technical skills will reduce, because it's difficult for you to change. If you want a higher grade, but at the same time you want to maintain or enhance your technical skills, then you cannot be in a higher grade.*

**Respondent 50 (Senior Technical Officer, Organisation A, March 2015)**

Nevertheless, the position of the leader depends on the organisational structure of the particular agency or department, as illustrated by Respondent 49, a Director in Organisation A:

> *It depends on where you are. For instance, if you are in this organisation, even though you are in Grade 54 (Senior Officer), you are still managing your technical skills and knowledge, you still need to know your technical [knowledge] because you have someone to report to. But if you are in the agency where Grade 41 (entry level or Junior Officer) is an IT Manager, then you will do much on managerial and less on technical because you have to pass the technical job to the programmer.*

**Respondent 49 (Director, Organisation A, March 2015)**

However, not everyone is suitable for the role of administrator or manager. Senior management should identify suitable officers at the outset, and then train them for these roles, as claimed by Respondent 54:

> *Maybe we can identify some officers who have... for example, leadership or communication skills and these officers that we need to train them to be an administrator, at the same time they can do the technical job.*

**Respondent 54 (Senior System Analyst, Organisation A, March 2015)**

From these findings, it is possible to deduce that the government has provided good management training and associated courses to improve the management skills amongst IT officers. Management skills also provide the ability to communicate effectively with other people in the department, organisation and even outside of the organisation. However, respondents felt that the organisation needed to improve and increase the availability of courses and training available to develop project management skills, especially for IT officers. Project management skills are important to all officers, given their direct involvement in the project's development and implementation, and it was felt that this might increase the success rate of government ICT projects. In addition, the government should identify suitable officers to act as administrators, who can perform effectively in both technical and managerial terms.

### 5.1.3 Lack of Recognition

A lack of recognition from the government, and the negative attitude of IT officers are both suggested as inhibiting factors in motivating staff to be more productive. IT officers also raised the issue of a lack of recognition from management, as shown in the following five statements from IT officers:

> *I felt that the SG [support group] section, which consists of 40 programmers didn't get anything [recognition]. We can see that during the monthly assembly, the best employee of the month award is normally received by officers from other sections.*

**Respondent 62 (Senior Programmer, Organisation A, March 2015)**

> *We need some reward or recognition from the management, but they [management] don't even appreciate what we have done so far… we felt so frustrated.*

**Respondent 61 (Technical Officer, Organisation A, March 2015)**

> *Staff work so hard, but not everyone gets the recognition... for those who were given the recognition should respect other employees, especially those who have been helping them. It doesn't mean that we have to be treated, but give something that we can appreciate.*

**Respondent 55 (Senior System Analyst, Organisation A, March 2015)**

> *One thing to make the [IT officer scheme] scheme officers be more passionate is to enhance their knowledge and skills by rewarding them with a promotion or increase the salary. At the moment, there is a lack recognition given to them.*

**Respondent 54 (Senior System Analyst, Organisation A, March 2015)**

> *We should not assign more work or increase their workload if there is no reward for them [IT officers]… no salary increment or promotion.*

**Respondent 59 (Management Officer, Organisation A, March 2015)**

This lack of recognition may also be related to the attitude of IT officers, which may fail to show their determination to undertake the assigned tasks and may cause the management to ignore them. This finding is based on two statements provided by senior analysts.

> *The main thing for IT officers to be recognised is they need to have a passion and a self-discipline… sometimes, we cannot blame the government for not recognising IT as an important role in the government administration. Partly [it is] because of their [IT officer] fault…*

**Respondent 54 (Senior System Analyst, Organisation A, March 2015)**

> *Sometimes I can see the attitude of some programmers is not what we expected, they are not serious about their work. Perhaps they are in the comfort zone.*

**Respondent 56 (Senior System Analyst, Organisation A, March 2015)**

Despite such concerns, the government has taken positive action in establishing a trust fund for staff, in order to incentivize in-house system development. This incentive may be perceived as appreciation of and recognition by the government for internal IT officers, as mentioned by the Director of Organisation A:

> *The government has set up a trust fund, which will be used as a token to the in-house system or application development… some incentive from the government to the officers involved in the development of in-house system.*

**Respondent 49 (Director, Organisation A, March 2015)**

These findings show a lack of recognition from the management towards IT officers. It is clear that recognition should be given to these staff, whether formally or informally, to acknowledge the value of their work to the organisation, as this will encourage them to increase their productivity and be more creative, innovative, and motivated to maintain or improve their high quality work; and it seems that this need will be met, at least in part, by the government setting up a trust fund to appreciate and recognise the value of work performed by technical staff.

### 5.1.4 Negative User Perception

The negative perceptions of the civil servant HRMIS users can be seen as an inhibiting factor to the implementation of insourcing.

The findings of this research indicate that users have negative perceptions of the system developed and maintained by the internal development team, with users still believing that the system developed by the previous outsourcing vendor was much better. This was indicated by three respondents from a user group:

> *I think the system is developed by [the vendor] because the response time is good now.*

**Respondent 44 (Teacher [User], Various Organisations, January 2014)**

> *The government IT officer cannot develop a better system because they rely on the vendor's expertise.*

**Respondent 47 (Senior Management Officer [User], Various Organisations, January 2014)**

> *IT officers in the government [are] just like technicians; they cannot develop a fully functioning system by themselves. They still depend on [the vendor] to develop a system.*

**Respondent 48 (State Officer [User], Various Organisations, January 2014)**

Statements provided by two IT officers further strengthen this finding:

> *They [government servants] still don't believe our staff can do better [than the vendor], that is what happening in the government.*

**Respondent 62 (Senior Programmer, Organisation A, March 2015)**

> *Some users still cannot believe that HRMIS is developed and maintained internally by civil servants in this organisation.*

**Respondent 69 (Programmer, Organisation A, March 2015)**

When asked in more detail for the possible reasons why users held such views, IT officers mentioned that users often felt that the system was not helping them, and was not important to them. Responses from four IT officers are as follows:

> *Some of them [senior officers] are refusing to use [HRMIS], and their staff have to do it [update information] for them… They still have negative thinking about [HRMIS].*

**Respondent 65 (Programmer, Organisation A, March 2015)**

> *The perception from some users, [is that] HRMIS is not helpful… they (users) perceived HRMIS is not important, but we want HRMIS to be like a one-stop centre system for everything.*

**Respondent 51 (Senior Management Officer, Organisation A, March 2015)**

> *Some of the users did not care about the system. Even at one point, they don't want to update their data in [HRMIS]… They just don't bother.*

**Respondent 52 (Senior Management Officer, Organisation A, March 2015)**

> *The users should be more responsible, they do not know because they can't see the function and benefit of HRMIS to them. For them, HRMIS is not important… because they think, what they are doing now is for their bosses [line managers] and government.*

**Respondent 59 (Management Officer, Organisation A, March 2015)**

From these findings, it can be seen that negative perceptions from users and stakeholders of the system may adversely influence the implementation of insourcing in public organisations, because users assume that internal IT officers are not capable of developing a complete system. Consequently, the internal IT officers must prove that they are capable of developing and managing a complete system better than the vendor, and that the government should do more to promote such a view.

## 5.2 CAPABILITIES – TECHNOLOGY (DIMENSION B)

Figure 5.3 shows there are three exciters and two inhibitors in this dimension that describe the interaction between capabilities and technology. This dimension also shows the interaction between usability and utility; technology and information (in the technology domain); and staffing and skills (in the capabilities domain) of the OPTIMISM model. The exciters are technical training for HRMIS technologies (capabilities → technology), creating a pool of programmers (capabilities → technology), and quality of service (technology → capabilities). The inhibitors are a lack of infrastructure to support user access (technology → capabilities), and a lack of Java expertise (capabilities → technology).

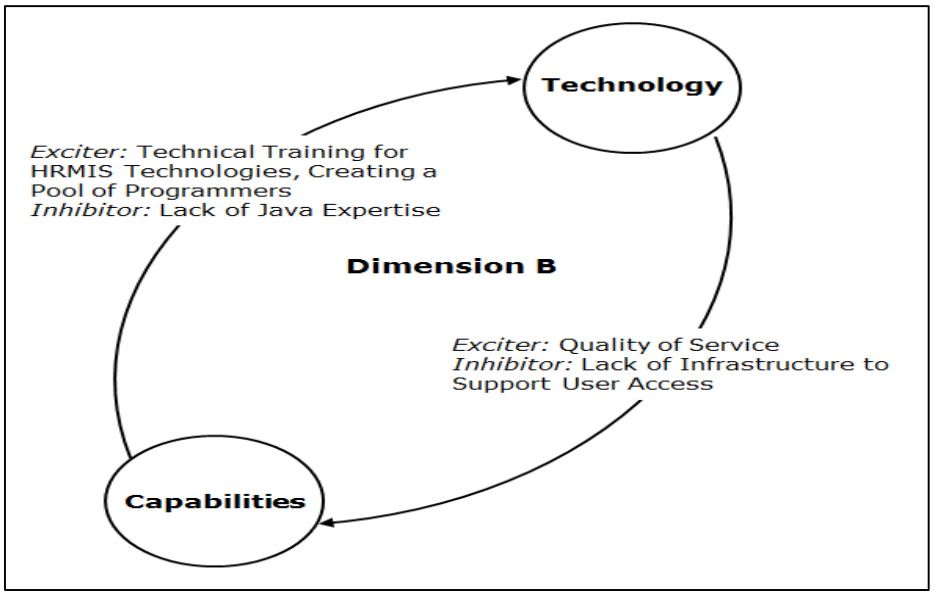


Figure 5.3: The Exciters and Inhibitors in Dimension B

### 5.2.1 Technical Training for HRMIS Technologies

Technical training for HRMIS technologies is an important factor in the insourcing of HRMIS, because technical training can provide the officers with new skills and knowledge to enable them to focus on the necessary programming language, database, system architecture and methodologies. Such training aims to increase the contribution that IT officers can make to systems development through the utilisation of acquired skills and knowledge. This study has discovered that IT officers often taught themselves, through experience and knowledge sharing gained after the termination of the vendor's contract in November 2011; enhancing their skills and knowledge in technology and programming languages. This is demonstrated in the statements from five IT officers:

> *When we have to do it by our self, we have to survive… so, we improve ourselves.*

**Respondent 50 (Senior Technical Officer, Organisation A, March 2015)**

> *Their [programmers'] skill is enhanced by doing a lot of programming.*

**Respondent 54 (Senior System Analyst, Organisation A, March 2015)**

> *Our technical skills and knowledge have improved a lot. If we have a problem or new issue, we have to solve the problem... by hook or by crook, we have to solve it either asking our friend within the organisation or from another agency, or we have to search from the Internet or to ask the experienced people.*

**Respondent 55 (Senior System Analyst, Organisation A, March 2015)**

> *What we have done to improve our skills and knowledge in programming language is we did a knowledge sharing among the programmers. Even though some of them are junior programmers, sometimes they know what we do not know because they have experience in the private sector before they joined the public sector.*

**Respondent 30 (Senior Programmer, Organisation A, November 2013)**

> *Knowledge sharing session among the officers is a good strategy to enhance our technical skills and knowledge, especially in HRMIS technology.*

**Respondent 9 (Senior Technical Officer, Organisation A, November 2013)**

As a result of sharing their knowledge and experience, the internal development team developed a new HRMIS, HRMIS2.0. Most modules in HRMIS2.0 were developed and maintained by the internal development team, as highlighted by two senior Systems Analysts:

> *For the next second submission of HRMIS2.0, most of the modules [were] developed by our programmers because they already understood the chronology of HRMIS.*

**Respondent 56 (Senior System Analyst, Organisation A, March 2015)**

> *They [programmers] developed HRMIS2.0 internally. I can see lots of improvement and I think this organisation has some experts in programming.*

**Respondent 57 (Senior System Analyst, Organisation A, March 2015)**

However, the specific technical training that the organisation provides relates only to HRMIS technology, as discussed by two programmers:

> *Training was more towards to Microsoft products such as SQL, ASP and ASP.Net.*

**Respondent 32 (Senior Programmer, Organisation A, November 2013)**

> *We [programmers] learnt about HTML5, Cascading Style Sheets (CSS) and JavaScript for a week.*

**Respondent 33 (Programmer, Organisation A, November 2013)**

> *The courses and training provided by INTAN more focuses on HRMIS technology such as SQL, ASP and ASP.Net in Microsoft products. Maybe INTAN should provide other courses like Open Source, PhP or Phyton.*

**Respondent 30 (Senior Programmer, Organisation A, November 2013)**

A senior programmer interviewed expressed the view that their skills had become more limited following the termination of the original vendor contract. He felt that as a consequence of this change, their knowledge and skills were now focused on systems development and programming skills rather than other expertise:

> *Under system development of the vendor, our roles are similar to a SA [System Analyst]. We have to study the system user requirements, do the system analysis and system design. But, now, we are only focused and concentrated on system development and programming skills.*

**Respondent 32 (Senior Programmer, Organisation A, November 2013)**

These findings indicate that the termination of the vendor's contract had a positive impact on the organisation, because it enhanced and improved the technical skills and knowledge of the internal officers with regards to the process of systems development, implementation and maintenance, which should also reduce the organisation's dependence on vendors in the longer term. However, there was a feeling that programmers should be encouraged and enabled to be expert in programming skills, not solely in meeting user's requirements, systems analysis, system design and project management, because these tasks can be handled by the systems analysts.

### 5.2.2 Creating a Pool of Programmers

The findings indicate that the creation of pool of programmers plays an important role in speeding up the development process, because the programmers have work in common. With insourcing, placing all the programmers into one unit can assist the organisation in managing programmers both more effectively and efficiently. Furthermore, it can also balance programmers' workloads. This is shown in the following three statements from IT officers:

> *I would prefer a system of pooling talent. Now, there is a pool of programmers. That's good because you can manage your resource much better.*

**Respondent 54 (Senior System Analyst, Organisation A, March 2015)**

> *I can see the pool system is good because the workloads amongst the programmers are balanced.*

**Respondent 56 (Senior System Analyst, Organisation A, March 2015)**

> *I like the concept of a pool of programmers because our work is balanced among us (programmer). The system analyst can give a task to any programmer available.*

**Respondent 69 (Programmer, Organisation A, March 2015)**

Furthermore, in this configuration, programmers are not bound to any one module or system, with any available programmer able to be assigned to any system or modules to develop or maintain a system, as stated by these three respondents:

> *It is much easier if we pool all the programmers. So, if we want to develop a system, we can use any available programmer.*

**Respondent 66 (Programmer, Organisation A, March 2015)**

> *Pool of programmers is good because the programmer can learn many modules in the system, not focus to a specific module.*

**Respondent 62 (Senior Programmer, Organisation A, March 2015)**

> *I can know the workflow process in many modules because [each] different module has different workflow.*

**Respondent 68 (Programmer, Organisation A, March 2015)**

Whilst there is clear evidence that maintaining a pool of programmers is a good concept, there is a need for job rotation amongst IT officers to enable them to learn new skills, which helps to improve their skills:

> *The government should implement a job rotation among IT officers because they can [do] other tasks as well, not only focus on a certain job or task.*

**Respondent 55 (Senior System Analyst, Organisation A, March 2015)**

> *Maybe the organisation can do a job rotation among programmers and assistant technical officers so that the assistant technical officer can also do the programming and the programmers can do technical jobs so that they can learn many skills.*

**Respondent 62 (Senior Programmer, Organisation A, March 2015)**

> *Job rotation is also a good approach to be implemented so that the programmers or technical officers are not in the comfort zone. They can be exposed to various work tasks and they can do multi-tasking job.*

**Respondent 57 (Senior System Analyst, Organisation A, March 2015)**

The findings reveal that the pool of programmers concept can enhance their technical skills and knowledge, especially in the development of a complete system, as programmers are not tied to any one specific module or system. However, the government also needs to consider the implementation of job rotation among IT officers to expose them to new knowledge, skills and perspectives.

### 5.2.3 Quality of Services

Since the termination of the vendor contract in November 2011, the quality of the system has improved, with users reporting improved system performance. Furthermore, the number of users has increased from 470,000 in 2011 to 650,000 in 2015. The system is now web-based and can be accessed using multiple

browsers from multiple client platforms. The development of two mobile applications, for the Android and iOS platforms, has also increased the number of users.

The improvement of the system is illustrated by the positive feedback offered by users. This is evidenced by two responses given by users of the system, and two responses gathered from the programmers.

> *HRMIS is good now; the system is much faster compared to the old system.*

**Respondent 35 (Assistant Officer [User], Various Organisations, January 2014)**

> *HRMIS has improved a lot, the response time is good.*

**Respondent 45 (Management Officer [User], Various Organisations, November 2013)**

> *When we took over the system from the vendor, we got positive feedback from the users… [the] system response time [is] much faster than the old system.*

**Respondent 67 (Programmer, Organisation A, March 2015)**

> *HRMIS has changed a lot, fast response time. Previously, we had lots of problems in term of performance, but now, we have solved it.*

**Respondent 65 (Programmer, Organisation A, March 2015)**

While the system was under development and maintenance by the vendor, the system could only be accessed in the office environment:

> *In previous years, they were using EGNet line, which it only can be accessed in the office environment. But now, the system [HRMIS] is a web-based platform; we can access from anywhere with an Internet connection.*

**Respondent 37 (Senior Management Officer [User], Various Organisations, December 2013)**

> *Easy because we can access the system from home… at the office, we can access from anywhere. And then, we can fill up the form very easily, compare last time; it is quite annoying to fill in the form manually.*

**Respondent 38 (Clerk [User], Various Organisations, January 2014)**

> *We can access the system at home… It is easy; we can fill in the Performance Appraisal Form in the system and we also can print out the form. Not like the previous year, [when] we have to fill in the form manually.*

**Respondent 35 (Assistant Officer [User], Various Organisations, January 2014)**

The development of HRMIS2.0 was the result of system improvements, which introduced the ability to access the system via multiple browsers, including Google Chrome, Internet Explorer, Safari and Mozilla. These improvements encourage more widespread use of the system, as more junior employees such as drivers and general workers also can access the system. This was supported by statements provided by four respondents:

> *Actually HRMIS2.0 is an improved system from the old HRMIS.*

**Respondent 52 (Senior Management Officer, Organisation A, March 2015)**

> *We developed HRMIS 2.0 to fulfil the needs of the users, which now, can be accessed in four browsers, namely Safari, Mozilla, Google Chrome and Internet Explorer. Now, the number of HRMIS users has increased.*

**Respondent 55 (Senior System Analyst, Organisation A, March 2015)**

> *HRMIS is good now. Now, everyone can use the system (HRMIS) even the drivers and general workers.*

**Respondent 58 (Senior System Analyst, Organisation A, March 2015)**

> *[It's] easy and I think easy is good because we can access the system through an internet connection by using our smart phone or iPad.*

**Respondent 42 (IT Technician [User], Various Organisations, December 2013)**

The development of a mobile application for the Android and iOS platforms also increased the number of users, even though only two modules of the system had been developed. This was explained by two respondents:

> *Now, we have developed two mobiles application for Android and iOS platforms for the users, which are MyHRMIS Cuti [Leave Module] and MyHRMIS Profil [Personal Profile Module].*

**Respondent 52 (Senior Management Officer, Organisation A, March 2015)**

The mobile phone apps were demonstrated to users prior to the official launch, and user feedback was very positive, as, Respondent 63 explained:

> *Most of the civil servants are very excited to use the mobile application … because these modules are easy to use.*

**Respondent 63 (Assistant Technical Officer, Organisation A, March 2015)**

The findings from this study show that the quality of service has improved since the termination of the vendor contract, and HRMIS is now fully supported by internal IT officers, who have the necessary capabilities to develop and maintain the system. Insourcing also enabled the development of an on-line web portal that provides services to government servants, and also helped to improve the technical skills and knowledge of government IT officers.

### 5.2.4 Lack of Infrastructure to Support User Access

In general, ICT infrastructure and network connectivity in Malaysia are good because the government has been providing network connectivity and ICT infrastructure to all government buildings in Putrajaya and Cyberjaya, encompassing more than 90 government agencies and 44,000 users. This was evidenced by the response of a respondent responsible for the government network:

> *All government buildings [in Putrajaya and Cyberjaya] involving 44,000 users for more than 90 government agencies.*

**Respondent 27 (Technical Officer, Organisation B, December 2013)**

However, despite this, some respondents mentioned that there were government agencies (particularly those located in rural and remote areas) that still had problems with network connectivity and their ICT infrastructure. This problem also

affected other agencies situated outside Klang Valley, Malaysia; and can be seen in the statements from five respondents:

> *Sometimes they [government offices in Sabah and Sarawak] had to reboot the servers a few times because of power outages.*

**Respondent 13 (Senior Technical Officer, Organisation A, November 2013)**

> *The infrastructure, especially in the Ministry [headquarters] is good but how about the infrastructure in rural or remote areas?*

**Respondent 16 (Senior Technical Officer, Organisation A, November 2013)**

> *They [government agencies] blamed us because they cannot access HRMIS but when we investigated the problem, the problem was actually caused by their network.*

**Respondent 51 (Senior Management Officer, Organisation A, March 2015)**

> *It does not mean HRMIS failed, but maybe because of the network disrupted.*

**Respondent 59 (Management Officer, Organisation A, March 2015)**

> *Users in the state agencies are having difficulty to access the system compared to the others in the federal agencies.*

**Respondent 43 (Management Officer [User], Various Organisations, January 2014)**

The findings from this research indicate that there are still some government agencies using out-dated ICT equipment, as supported by the statements of the following three respondents:

> *They are still using the desktops with big CRT and slow RAM… the agency needs to take action on this matter; we cannot do anything.*

**Respondent 65 (Programmer, Organisation A, March 2015)**

> *The PC [personal computer], laptop and even a server in the HQ [headquarters] are using the latest technology but in the state or small agencies, I think the technology used is not the latest… there is a huge gap between the state and the HQ.*

**Respondent 66 (Programmer, Organisation A, March 2015)**

> *There are some agencies still use the out dated ICT equipment and technology especially small agencies and agencies in the rural or remote areas.*

**Respondent 1 (Senior Management Officer, Organisation A, November 2015)**

From these findings, it is clear that the ICT infrastructure and network connectivity in the government agencies needs to be expanded, improved and upgraded, especially in rural, remote areas and in agencies based outside the Klang Valley. This will ensure that the system can be accessed at anytime and anywhere with an Internet connection. Furthermore, the government should also assess the ICT equipment and technology used by the various agencies to reduce the current technology gap.

### 5.2.5 Lack of Java Expertise

A lack of expertise in object oriented system architecture and system design is an inhibiting factor to the insourcing of HRMIS. In-house expertise is important to ensure the system can be developed and maintained on time and within budget. This is shown in the following three statements:

> *What I can see right now, we are lacking experts, especially experts in system architecture design that can see the whole system.*

**Respondent 50 (Senior Technical Officer, Organisation A, March 2015)**

> *We still depend on the vendor to see the whole system in the government because it's hard to find an expert in system architecture and system design.*

**Respondent 24 (Deputy Director [Technical], Organisation B, December 2013)**

> *For my module [Organisational Development]… there is no expert in this module and none of the officers in this organisation know about the workflow and process of this module.*

**Respondent 57 (Senior System Analyst, Organisation A, March 2015)**

Since the termination of the vendor contract, the senior management has instructed the team to develop a new system using JavaScript, but due to a lack of expertise in JavaScript, the system cannot be developed in a reasonable time frame, as indicated by Respondent 33:

> *[Senior management] has proposed to use totally Java [JavaScript] for a new system. But we don't have an expert in JavaScript, and yet we can't find an expert to guide and train us.*

**Respondent 33 (Programmer, Organisation A, November 2013)**

> *We are still in the process of learning the JavaScript, but the top management wanted us to complete the system in a short time. However, we can't do it because of a lack of an expert in JavaScript.*

**Respondent 31 (Senior Programmer, Organisation A, November 2013)**

Furthermore, most internal programmers are experts in ASP and ASP.net, the programming language behind HRMIS, as Respondent 30 explained:

> *We don't have an expert in JavaScript… So far, most programmers [are] only expert in ASP and ASP.Net.*

**Respondent 30 (Senior Programmer, Organisation A, November 2013)**

Respondent 67 suggested that the government should have a national IT department to manage and administer all the systems within government, in order to form a research and development (R&D) team to increase expertise in information systems in the public sector:

> *If the establishment of the IT department becomes a reality, there is a chance to create an R&D team where there will be many experts and consultants.*

**Respondent 67 (Programmer, Organisation A, March 2015)**

Respondent 67 also added that the formation of a research and development (R&D) team could create greater expertise in the public sector:

> *We need a team like R&D (Research and Development) team, just like in the manufacturing sector, because we lack experts in R&D, systems analysis, system design and system designers that know everything about the system.*

These findings show internal expertise in system development is crucial when insourcing a government IS, because internal experts and IT officers can then work together to develop the system without the assistance of third parties or outsourcing vendors, and therefore, a systematic and comprehensive training programme must be developed to enhance and upgrade the skills and knowledge of existing public sector IT officers.

## 5.3 INSTITUTIONS – TECHNOLOGY (DIMENSION C)

Figure 5.4 shows that there are three exciters and two inhibitors in this dimension that explain the interaction between institutions and technology. This dimension also shows the interaction between processes, technology and information (in the technology domain); and investment, resources, milieu, management structure and systems (in the institutions domain) of the OPTIMISM model. The exciters are data centralisation (technology → institutions), and government support for network infrastructure (institutions → technology). The inhibitors are system complexity (technology → institutions), and government regulatory policies (institutions → technology).

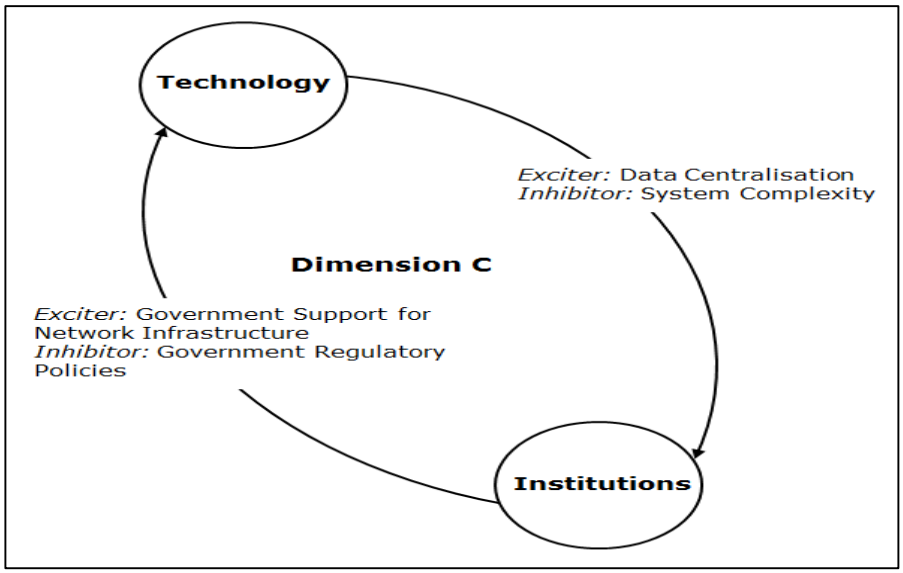


Figure 5.4: The Exciters and Inhibitors in Dimension C

### 5.3.1 Data Centralisation

Data centralisation, which has seen HRMIS become a one-stop centre for all HR data, and which has also improved decision-making, is an exciter for the efficient execution of government processes.

These findings indicate that data centralisation can help the government to change, reorganise and analyse information, because all the information can be accessed from the same location at the same time. Previously, the data needed to be collected from multiple agencies, and it took a long time to consolidate the data. This was shown in a statement gathered from a Senior Management Officer:

> *In the past, we had to collect data from each agency, and it takes time.*
>
> **Respondent 1 (Senior Management Officer, Organisation A, November 2013)**

HRMIS has now centralised all information about civil servants, from the date of appointment until the date of retirement, providing a single streamlined system about government servants. This is evidenced in the statements of the following four respondents:

> *Civil servants can find any information about a human resource service from the system.*

**Respondent 3 (Senior Management Officer, Organisation A, November 2013)**

> *When [HRMIS] is available, it can capture the data to cater for all the information of government servants. We can get all the information from the date of appointment until the date of retirement.*

**Respondent 51 (Senior Management Officer, Organisation A, March 2015)**

> *[HRMIS is a] one-stop centre for information services of public servants, starting from the date of appointment until the date of retirement.*

**Respondent 43 (Management Officer [User], Various Organisation, January 2014)**

> *We have everything in HRMIS, just like our Service Book. We can have the history of our services from the date of appointment until now because sometimes we forgot about our employment history. For example, for those who have served more than ten or twenty years, they can retrieve back all the information.*

**Respondent 2 (Senior Management Officer, Organisation A, November 2013)**

HRMIS enables senior management to improve the decision-making process, and to conduct effective human resource planning for the career development of government servants. This finding is supported in the statements of three of the respondents:

> *The system can generate a lot of [reports] to the government for human resource planning and career*

**Respondent 7 (Senior Technical Officer, Organisation A, November 2013)**

> *With the system, the government can know how many officers are in the public sector. It is easy to monitor and make a plan.*

**Respondent 12 (Management Officer, Organisation A, November 2013)**

> *HRMIS serves all civil servants, and it is becoming more relevant because we manage the system properly and we can deliver what are requirements of the stakeholders... And then, the direction and scope of our work in this*

> *division [Information Management Division] is to fulfil the needs of the civil servants.*

**Respondent 59 (Management Officer, Organisation A, March 2015)**

These findings show that by insourcing HRMIS the government has improved the decision-making process, because they can now access all the information on civil servants from a single system. Data centralisation is also allowing the government to conduct planning of human resources in the public sector more effectively and efficiently.

### 5.3.2 Government Support for the Network Infrastructure

Improved support from government for the network infrastructure is improving both network connections and commitment from senior management. The findings indicate that research respondents believed that government support is required to ensure the system can be implemented successfully at all levels of government, including state governments, statutory bodies and local governments. The government has upgraded the network infrastructure and facilities, particularly in Putrajaya (the federal government administrative centre), Kuala Lumpur and Cyberjaya to increase network connectivity in government offices. Five statements from respondents support this finding:

> *Now, the government has introduced Putra Wi-Fi, free Internet access in the government office, not only for government servants but also for the public. We have also upgraded the bandwidth up to 1GB but we can increase the bandwidth if there is a request from any government agency because currently, the network is still under utilised.*

**Respondent 27 (Technical Officer, Organisation B, December 2013)**

> *Now, we have provided the Wi-Fi (wireless fidelity, wireless Internet) facilities in this organisation to the public.*

**Respondent 20 (Senior Technical, Organisation A, November 2013)**

> *MAMPU has upgraded the network capacity of OneGov.Net and the lowest bandwidth is about 2MB but they [government agencies] can request from MAMPU if they want to upgrade the bandwidth.*

**Respondent 8 (Senior Technical Officer, Organisation A, November 2013)**

> *Now, we have upgraded the network from ATM [asynchronous transfer mode] to MetroE because the technology of ATM was out dated.*

**Respondent 24 (Deputy Director [Technical], Organisation B, December 2013)**

> *In the network technology, we used FCOE, Fibre Channel Over Ethernet, a combination of Internet and fibre technology.*

**Respondent 22 (Technical Officer, Organisation B, December 2013)**

These findings demonstrate that the government has provided a good ICT infrastructure and facilities, as well as improved network connectivity to increase the number of HRMIS users.

### 5.3.3 System Complexity

Due to its size and complexity, HRMIS is a complicated system to develop, requiring a large database in order to accommodate the details of a total of 1.5 million civil servants in Malaysia. HRMIS is a combination of a number of human resource management systems, including annual leave management, the payroll system, the expenses claim system, career development and performance management, as five respondents explained:

> *HRMIS is a national system, which every government agency in Malaysia will use it. So, I think HRMIS is the largest information system in the Malaysian government.*

**Respondent 8 (Senior Technical Officer, Organisation A, November 2013)**

> *HRMIS is quite complicated because the system starts from the appointment date [and lasts] until the retirement date of the officer… the data keeps increasing but [is] never reduced. Although the officer has retired from the government, we cannot delete the data until the death of that officer, and we cannot find any other system like HRMIS.*

**Respondent 51 (Senior Management Officer, Organisation A, March 2015)**

> *If you compared a system at the other agencies or ministries, they have a leave management system as one system and a payroll system as one system, but for HRMIS, we called it a module, with each module has a few sub-modules… each sub-module can be represented as a complete system.*

**Respondent 56 (Senior System Analyst, Organisation A, March 2015)**

> *Actually, it's quite complicated even when we are talking about a module. For me, a single module can represent a complete system. Even though the last part of the module is [the] maintenance sub-module, which the staffing specialist will use that module, but they have to do the maintenance for Heads of Service for each service, service classification and so on and the sub-module itself has about 60 screens to maintain.*

**Respondent 57 (Senior System Analyst, Organisation A, March 2015)**

Respondent 50 added that they thought that the organisation needed to be ready to develop the system, as it encompasses not only an application, but also system maintenance and servers:

> *The whole organisation needs to be ready to develop the system internally, not only for [the] application, but they have to know about the maintenance and [the] servers, such as server settings and server configuration.*

**Respondent 50 (Senior Technical Officer, Organisation A, March 2015)**

The issue of system integration among the various systems in the Malaysian government also contributes to the complexity of the system, which occurs because every ministry has different system platforms or applications that cannot be integrated. Five statements were offered by respondents regarding this issue:

> *The problem of the system in Malaysia [is], every ministry wants to develop their own system, and they don't want to share or integrate with others.*

**Respondent 5 (Deputy Director [Management], Organisation A, November 2013)**

> *Different ministries use different platforms or software. That's why we as the technical people have difficulty to integrate the system… maybe because they have a contract with the vendor and they cannot change the technology or platform.*

**Respondent 17 (Technical Officer, Organisation A, November 2013)**

> *The systems are large and good, but they are not communicating with another system. For example, in this ministry, the systems might not communicate with another ministry.*

**Respondent 40 (Senior Management Officer [User], Various Organisations, January 2014)**

> *[The] public has complained about the system in the government, because the systems are not integrated… they have to go to many places (ministries) to get a service from the government, they want a system that [is] integrated to all main services.*

**Respondent 42 (IT Technician [User], Various Organisations, December 2013)**

> *The government needs to develop an integrated system that links to all government agencies, such as the National Registration Department, Police, Treasury, Customs Department, Housing Loans and so forth… even in this ministry, they have so many systems and if possible, we want just one system that integrates all the systems.*

**Respondent 46 (Clerk [User], Various Organisations, January 2014)**

However, based on these findings, it seems that there are several government departments that are keen to integrate their systems with other agencies, but there are limitations that need to be overcome, as illustrated in the statement from a Deputy Director:

> *Maybe they [government agencies] don't have the capacity to integrate the system or they don't want to upgrade their system… and MAMPU is not trying to understand the limitations faced by the agencies because MAMPU just gives orders without studying the consequences. Another thing is about budget, because MAMPU only provides the platform, but how to proceed,*

*the agencies have to come out with their own budget and the agencies have a limited budget to implement.*

**Respondent 23 (Deputy Director [Management], Organisation B, December 2013)**

These findings show that the complexity of the system can be an inhibiting factor in the implementation of insourcing an IS. Therefore, standardisation of the technology, platform and software in the implementation of ICTs project could help to integrate the system across government agencies.

### 5.3.4 Government Regulatory Policies

Government regulatory policies lack standardisation, particularly in areas such as procurement. Business processes involve many layers of management, which introduces delays and bottlenecks in decision-making and information flows, and therefore, regulatory policies are inhibiting factors to efficient government.

These findings indicate that government policies and regulations are inhibiting factors because government agencies, even within the ministry or department, tend to work in silos. Each government administration has its own policies and regulations, especially in regard to the implementation of ICT projects. In practice, although federal policies are created, state governments, statutory bodies and local authorities rely on their own policies, perhaps also adopting federal policies in part. This was revealed in the statements of four respondents:

*For the state, statutory bodies and others are different processes because they have their own acts.*

**Respondent 5 (Deputy Director [Management], Organisation A, November 2013)**

*We have about 720 government agencies that consist of five types of government services: Federal Civil Service, State Civil Service, Federal Statutory Bodies, State Statutory Bodies and Local Authorities. The problem is, the [Public Service Department of Malaysia] can handle the Federal agencies, but others, they have their own procedures.*

**Respondent 20 (Senior Technical Officer, Organisation A, November 2013)**

> *Actually, we want to capture the system according to standard procedures, but because of the different service schemes, maybe they have a different process. So, we have to go to every agency. That's why the process will take longer and [is] tedious, because every agency has their own procedure.*

**Respondent 3 (Senior Management Officer, Organisation A, November 2013)**

> *Every agency has its own core business. They [government agencies] tend to concentrate on their core business.*

**Respondent 13 (Senior Technical Officer, Organisation B, December 2013)**

Business processes are governed by complicated policies, motivated by the need to minimise the risk of corruption. These complexities are exacerbated by existing organisational structures, which contain multiple layers. For example, there is a long procurement process, with it often taking some six months to acquire ICT services or equipment, which results in the risk that the requested technology or software will be out-dated by the time it is delivered; a fact supported by the statements of three respondents:

> *Government has some policies that we need to follow and we have to understand them. If you do not comply with the policies, then you have to answer to the auditor.*

**Respondent 58 (Senior System Analyst, Organisation A, March 2015)**

This assertion was supported by Respondent 51:

> *As we are aware of the procurement process in government, if we did it fast, then people will say there is corruption. If we follow the procedure, it will take at least six months to get the equipment or services [that] we want.*

**Respondent 51 (Senior Management Officer, Organisation A, March 2015)**

There is also a complex procurement process for systems development, as explained by Respondent 50:

> *In the process for system development, the Application Section has their own SOP [Standard Operating Procedure] to comply with. If you want to*

> *develop a new system or application, you have to forward a proposal to the meeting through the Application Section, which has a committee called the System Development Committee. After you have submitted the proposal, they [the Application Section] will prepare a document to be presented to the [System Development] committee. Then, all the committee members will discuss [the proposal] and give their comments. If your proposal is approved, then you can proceed with the system development with a number of man-days [duration].*

**Respondent 50 (Senior Technical Officer, Organisation A, March 2015)**

These findings show that government regulatory policies can inhibit efficient government, and that the government should improve and simplify existing business processes in order to reduce red tape in the government; and furthermore, it could better expedite the process of system development and maintenance in the public sector.

## 5.4 COST (DIMENSION A, B, C)

Cost clearly plays an important role in system development and maintenance, but different costs map to different dimensions in the analytical framework. Costs also include investment resources of the OPTIMISM model, with the cost of undertaking system development, implementation and maintenance reduced following the termination of the outsourcing vendor contract, as indicated by three respondents:

> *It [a system developed by the vendor] is just too expensive to get somebody to [develop the system] for you, because it's not a one-off investment… it's a long-term investment.*

**Respondent 49 (Director, Organisation A, March 2015)**

Respondent 33 echoed this opinion:

> *We can save more money… our System Analyst has made an estimation based on a calculation of man-days per year; we can save about RM1.2 million [£221,027[6]].*

**Respondent 33 (Programmer, Organisation A, November 2013)**

[6] Based on exchange rate on 1st January 2014 (Oanda, 2016)

Furthermore, the charging model in the outsourcing vendor contract resulted in increased costs after the maintenance period expired, as stated by Respondent 59:

> *When the maintenance contract expired, they [the vendor] charged the government [a] higher price for every change. For example, if we have changes in our regulations, we have to update the system. So, we have to call [the vendor] and they will charge higher costs.*

**Respondent 59 (Management Officer, Organisation A, March 2015)**

However, it is important to remember that although the termination of the vendor contract may save money, investment will be required in other areas, as explained in three statements from two respondents:

> *We use old technology for HRMIS, and if we want to change (to new technology), maybe it involves a lot of money.*

**Respondent 4 (Senior Management Officer, Organisation A, November 2013)**

> *I think the government will have to spend more money after [the] termination of the vendor [contract] because now, we have to purchase the ICT equipment, servers and software licensing by ourselves.*

**Respondent 8 (Senior Technical Officer, Organisation A, November 2013)**

Respondent 58 also added that cost of training depends on how many participants attend each course:

> *If the number of participants is less than ten, it is better if we send them to the external trainer. We will do an in-house training if the [number of] participants is more than ten.*

**Respondent 58 (Senior System Analyst, Organisation A, March 2015)**

These findings show that insourcing HRMIS has reduced systems development and maintenance costs, although the move required investment to update system technologies, purchase ICT equipment and train internal staff. The issues involved in the necessary system enhancement and maintenance, following termination of the outsourcing vendor contract has been discussed above, and the analytical

framework has also been used to illustrate the exciters and inhibitors in each dimension. From this wealth of primary data, it is possible to perform an overall analysis of the research findings.

## 5.5 SUMMARY OF CHAPTER AND CONCLUSIONS

In this chapter, four perspectives on insourcing were analysed, through the lens of institutional theory and the capability approach. The groups investigated were managers, technical staff, programmers and users of the system. Their contributions make up the findings of this research.

The exciters and inhibitors highlighted in Dimension A consider the impact of the implementation of insourcing government ISs from the perspectives of capabilities and institutions, with the exciter from institutions to capabilities being resources for training; and management skills from capabilities to institutions. Meanwhile, the inhibitor from institutions to capabilities is a lack of recognition. In Dimension B, there are two exciters: technical training for HRMIS technologies from capabilities to technology; and quality of service from technology to capabilities. There are also two inhibitors in Dimension B, a lack of Java expertise from capabilities to technology, and a lack of infrastructure to support user access from technology to capabilities.

Despite the two inhibitors located in Dimension C – system complexity from technology to institutions, and government regulatory policies from institutions to technology, there are also two exciters that can be identified from the analytical framework, namely data centralisation from technology to institutions; and government support for network infrastructure from institutions to technology. Project costs do not map neatly to the analytical framework, because they can be mapped into all dimensions, indicating that whilst the implementation of insourcing may reduce the cost of maintenance, the vendor's contract, and the cost of problem solving by the vendor (institutions); simultaneously, the cost of staff training (capabilities) and the purchase of software licences and ICT equipment (technology) will have to be met.

Using a combination of institutional theory and the capability approach, all information gathered was analysed and mapped to the analytical framework. This analytical framework enabled the researcher to identify the six exciters and six inhibitors of insourcing a government IS, gained from the combination of two series of data collection studying the implementation in public organisations. The analytical framework has also indicated that insourcing a government IS will have a positive impact on government in the longer term.

# CHAPTER 6: DISCUSSION

## 6. INTRODUCTION

The research findings presented in Chapter Five introduced the seven exciters and six inhibitors to insourcing a government IS. By analysing the interactions amongst the institutions, capabilities and technology dimensions of the enhanced analytical framework, which was devised using a combination of institutional theory, the capability approach, ICTs and the OPTIMISM model; the seven exciters identified are resources for training; management skills; technical training for HRMIS technologies; creating a pool of programmers; quality of service; data centralisation; and government support for network infrastructure. The six inhibitors are a lack of recognition; negative user perceptions; a lack of Java expertise; a lack of infrastructure to support user access; system complexity and government regulatory policies.

This chapter discusses these key findings, examining how the interactions between institutions, capabilities, technology and the multiple dimensions of the OPTIMISM model further develop understanding of insourcing implementation. This chapter will outline the contribution that this research is making in the area of building an internal development team's capabilities. It also considers the wider implications of insourcing implementation, whilst also highlighting the perceived relationships between the different dimensions of the analytical framework.

Each of these exciters and inhibitors have been evaluated to see how insourcing affects and influences implementation of the HRMIS system in the Malaysian public sector organisations, and this research aims use this evaluation to fill the gaps that currently exist in the literature on the implementation of insourcing a government IS. Selected parts of this chapter have been presented at two conferences[7].

[7] These papers have been presented at the 13th International Conference on Social Implications in Developing Countries, Negombo, Sri Lanka from 20th – 22nd May, 2015 organised by IFIP WG9.4: Social Implications of Computers in Developing Countries and the International Conference on Information Society (I-Society 2015), Technical Co-Sponsored by IEEE UK/RI Computer Chapter in London, United Kingdom from 9th – 11th November, 2015.

## 6.1 CAPACITY BUILDING OF THE INTERNAL DEVELOPMENT TEAM

The main contribution of this research concerns capacity building of the internal development team. By drawing on the research findings in Chapter Five, it is possible to deduce that the capacity building of the internal development team is a crucial issue, highlighted in a number of dimensions in the analytical framework as described in Section 5.1.1, 5.1.2, 5.2.1, 5.2.2, 5.2.5 and 5.3.3. It was identified in the interaction of technical training for HRMIS technologies, and creating a pool of programmers from the capabilities to technology components in Dimension B; the quality of services in Dimension B from technology to capabilities; management skills in Dimension A from capabilities to institutions and resources for training from institutions to capabilities in Dimension A.

The normative pressure has been used by the organisation, which is the enforcement of government circulars for the implementation of HRMIS has been applied throughout all the Malaysian government agencies. This pressure led to the organisation to make sure the system can be accessed effectively and efficiently by the users. Furthermore, it is a norm practice in the Malaysian government by enforcing Key Performance Indicators (KPI) for all Secretary General of Ministry to increase the number of HRMIS users in their organisation and the goals and objectives of an organisation can be achieved by determining appropriate ways to pursue them. Therefore, the internal development team must possess a strong information technology skills and knowledge to ensure the system can be implemented successfully and to fulfil the requirement and need of the stakeholders. The enhancement of the internal development team's capabilities can help the internal staff to innovate, to be more creative and to respond to changing the stakeholder's needs, which these capabilities are the outcome of investments in staffing, training (internal and external training providers), knowledge sharing, experience, compensation, communication, and other human resources areas.

Moreover, the concept of pooling all the programmers that has been introduced by the organisation also help to enhance the capabilities of internal development team. This concept placed all 40 programmers in one unit called the System Development Sector. The internal development team is not dedicated to specific

module or system in the organisation. As a result, the internal development team can be assigned to any module or system as required and gain multiple skills in programming languages as well as knowledge about all the modules in HRMIS. Therefore, the management of an internal development team can be more efficient and the workload can be balanced among them. Furthermore, after termination of the vendor contract in November 2011, system quality service improved because the internal development team became able to make changes and modify the system coding and programming structure. Previously, the internal development team was not allowed to make any modifications or changes in the coding and programming structure, as stated in the contract.

Although work by Reynolds and Seddon (2010) focused on private sector organisations operating in OECD countries, this research concurs with their findings that insourcing an IS has enhanced the capabilities and skills of internal IT staff members. The findings in this study demonstrate that following termination of the vendor contract, the technical skills and knowledge of the internal development team were enhanced, not only in ASP, ASP.Net programming and MySQL; but also in JavaScript, PHP, Postgres, Oracle and Open Source technology. Consequently, the new version of HRMIS produced by the internal team developers (HRMIS2.0) used the JavaScript programming language; allowing the system to be accessed on multiple browsers and platforms.

### 6.1.1 Access to Advanced Technology

The use of advanced technology to access the system is a direct impact emanating from the capacity building of the internal development team. Although Gantman (2011) claimed that outsourcing might be used to gain access to advanced technologies, this research has revealed that the outsourcing contract underpinning the original HRMIS system actually inhibited the adoption of new technologies. Research findings show that during periods of system development and maintenance undertaken by the vendor between June 1999 and November 2011, the system could only be accessed on site using a single browser (Internet Explorer (IE)) and on a single platform (Microsoft Windows). After termination of the vendor contract, the number of active HRMIS users has increased from

470,000 to nearly 650,000, from a total of 1.5 million government employees (Woo, 2014). This increase is due to the fact that HRMIS can now be accessed from anywhere with an Internet connection. Furthermore, HRMIS also can be accessed through multiple browsers, such as Internet Explorer (IE), Mozilla, Safari and Google Chrome; and via multiple platforms, including Microsoft Windows and Mac OS. This study also found that the internal development team has also developed two mobile applications, using the Android and iOS platforms: *MyHRMIS Cuti* (HRMIS Leave Application) and *MyHRMIS Profil* (HRMIS Personal Profile).

After the termination of the vendor contract, the organisation also increased the number of servers from 25 to 40 units, to manage the increase of potential HRMIS users. The government has upgraded the network from ATM (asynchronous transfer mode) to MetroE (Metropolitan-area Ethernet), while the capacity and bandwidth has increased from 1GB to 10GB, to ensure that users can access HRMIS without experiencing any disruption. The government also installed PutraWiFi, the government's Wi-Fi service, in all government offices in the Federal Government Administrative Centre of Putrajaya. This initiative ensures that users can access HRMIS through the two mobile applications, *MyHRMIS Cuti* (HRMIS Leave Application) and *MyHRMIS Profil* (HRMIS Personal Profile).

Insourcing the government IS has also significantly motivated the internal programming team to be more creative and innovative in their system development and maintenance, in order to deliver a better system to the users, because the internal team developers and IT staff have a detailed knowledge of the governmental organisational structure and therefore better understand the needs of system users, as they are themselves also users of the system. Although Khadaroo et al. (2013) claimed that the successful outsourcing of IT development is a key factor in facilitating the implementation of e-government projects, the findings of this research actually revealed that the outsourcing vendor failed to deliver a successful system to the Malaysian government, ultimately leading the government to terminate the vendor contract in November 2011. Whilst the previous literature seems to suggest that outsourcing can provide a better system and employing advanced technology, in the case of HRMIS, it is clear that insourcing to the internal team enabled the development of a better system and

improved access to advanced technology that supported mobile devices and the expansion into different browsers.

### 6.1.2 Government Cost Efficiency

A further impact of the enhancement of the internal development team's capabilities is evidenced in the area of cost efficiency. Although Gantman (2011), Dhar (2008), and Berg & Stylianou (2009) all claim that outsourcing reduces the costs of IS development and maintenance, this research found that in reality, the Malaysian government has saved RM1.2 million (£221,027[8]) through insourcing. By implementing insourcing in the public sector, the process of systems development and maintenance is entirely controlled by internal staff, making it easier for internal staff to make the necessary changes to the system as they arise; which is fairly frequently given that HRMIS is strongly linked to the government's human resource management policies and is often updated. By contrast, when the system was under the development and maintenance of the vendor, many complaints were expressed users, regarding the poor performance of HRMIS, which did not meet the users' expectations or requirements Changes and improvements made to the system by the vendor levied an additional charge to the government, which was based on a calculation of man-days, meaning the longer it took to solve a problem, the higher the maintenance cost was paid by the government. The projection of man-days was stipulated in the contract between the vendor and the government.

The findings of this study confirm Lacity and Hirschheim's (2012) results in Organisation for Economic Co-operation and Development (OECD) countries, which showed that insourcing reduced costs; although their focus for investigation was data consolidation. The government cost in terms of efficiency also relates to the nature of the vendor contract. This research has discovered that a long-term contract with a vendor can cause the government to become bound by the contract that has been signed, because the cost of system development is a long-term investment. Although Goo et al. (2007) and David et al. (2007) both found that the duration of a vendor contract should be more than ten years in order to

[8] Based on exchange rate on 1st January 2014 (Oanda, 2016).

increase the likely success of IT outsourcing, this research has found that the 12 years that the vendor contract was operational for HRMIS did not help the organisation to reduce costs, with the costs of managing the vendor and systems maintenance increasing annually. Contract terms stipulated by the vendor may impose high maintenance costs, requiring the government to bear the high cost of systems development and maintenance.

In summary, the primary contribution of this research is located in the area of capacity building of the internal development team, which was derived from the application of the enhanced analytical framework. This enhanced model has helped to improve and optimise the development, implementation, evaluation and maintenance processes of the ICT project in the context of the Malaysian government.

## 6.2 SUMMARY OF CHAPTER AND CONCLUSIONS

This study has explored the issues arising from the post-contract termination of an outsourcing agreement in a large government IS in Malaysia. The research has explored and identified the exciters and inhibitors associated with insourcing in a public organisation, with key contributions to the literature. The findings of this study are the result of the combination of two series of data collection; discovering seven exciters and six inhibitors of insourcing a government IS, applying the theoretical lenses of institutions and capabilities. An analytical framework was used to evaluate how the exciters and inhibitors affect and influence the implementation of insourcing an IS in the context of the Malaysian public sector.

The primary research contribution is in the area of the capacity building of internal development teams, which has determined that with the necessary enhancements, internal development teams can develop a much better system, using advanced technology and which allows the government to reduce the costs of its IS development and maintenance.

# CHAPTER 7: CONCLUSIONS

## 7. INTRODUCTION

This chapter brings together the research conclusions, potential contributions to the discipline, recommendations and ideas for future work. This study set out to explore the impact of enabling and inhibiting factors when insourcing a government IS in a developing country. The research has identified seven exciters and six inhibitors of insourcing HRMIS in Malaysia, and makes a key contribution to knowledge in the area of capacity building of internal development teams.

This chapter has been divided into seven sections. Section 7.1 summarises the thesis; Section 7.2 revisits the research questions; Section 7.3 discusses the limitations of this research; Section 7.4 outlines the research contributions; Section 7.5 presents the conclusions; Section 7.6 makes recommendations for future practice and Section 7.7 provides suggestions for further research.

## 7.1 SUMMARY OF THE THESIS

The aim of this research has been to explore and identify the enabling and inhibiting factors of insourcing a government IS in Malaysia, viewed from the perspectives of institutions, capabilities and technology. Following an examination of the literature and other secondary data, it became clear that there was comparatively little research in this area, with existing research focused on outsourcing. Consequently, there was a clear need for an in-depth study into insourcing a government IS, particularly from a developing country perspective. The gap in the literature led to a critical examination of the appropriate theories and frameworks that could be used to explore and identify the enabling and inhibiting factors of insourcing in public organisations.

A combination of institutional theory and the capabilities approach was selected as the analytical framework from which to evaluate the impact that insourcing has on the institutions, capabilities and technology of the organisation, along with the associated benefits and challenges. This framework provided the descriptive tool with which to organise and analyse the exciters and inhibitors influencing insourcing in public organisations. A qualitative research method was selected,

using semi-structured open-ended interviews with 69 civil servants in Malaysia, gathered from two series of data collection. Malaysia was selected as the case study, to take advantage of the personal knowledge of the researcher. Ethical considerations and the reliability and validity of the research were taken into account when conducting this research, in order to ensure its viability.

The research findings were presented and compared with the existing literature on outsourcing an IS. As previously discussed, there were found to be seven exciters and six inhibitors to insourcing a government IS in the Malaysian government, as identified through the combination of the institutions and capabilities framework. Selected findings have previously been accepted for publication in EJISDC, and also presented at two conferences (Omar et al., 2015a; Omar et al., 2015b). In Dimension A of the framework, exciters include resources for training, and the management of training and skills acquisition, while the inhibitors are a lack of recognition and poor perceptions from users. The exciters in Dimension B of the framework include technical training and skills in HRMIS, the benefits of having a pool of programmers, and improved quality of service, while the inhibitors include a lack of expertise and the lack of infrastructure. In Dimension C, the exciters are data centralisation and government support, while the inhibitors are the complexity of the system and the constraints of government policies and regulations. In addition, cost can be mapped into all dimensions of the framework.

Based on the interaction between exciters and inhibitors illustrated in the enhanced analytical framework showing the different dimensions, it is clear that there is a research contribution to be made in the area of the enhancement of the capabilities of the internal development team. The enhanced model was developed by mapping the OPTIMISM model with the capability approach, institutional theory and technology (ICTs) analytical framework; which has been used to evaluate the development, monitoring and implementation of insourcing a government IS.

## 7.2 RESEARCH QUESTIONS REVISITED

This research represents the largest study ever undertaken on the insourcing of a government IS in a developing country, with a total of 69 interviews being

conducted with civil servants in Malaysia. It has aimed to improving understanding regarding the insourcing approach, and the extent to which insourcing an IS may stimulate systems development and maintenance in a public organisation. Three research questions were outlined at the beginning of this research:

a) **How can we determine the enabling and inhibiting factors of insourcing an IS in a public organisation?**

b) **What are the factors that influence the success of insourced government ICT projects?**

c) **To what extent does insourcing a government IS have an impact on the public organisation?**

A qualitative research approach, in the form of open-ended, semi-structured interviews, was adopted in this research in order to gather empirical data and information from the respondents based on their opinions, knowledge and expertise. Questions posed to respondents related to the insourcing of a government IS after the termination of the previous outsourcing vendor contract. Interviews were carried out with managers, technical staff, developers and users, and all interviews took place in Malaysia, in two series of data collection.

This study is the first to use a combined institutional and capabilities approach to explore the insourcing of a government IS in a developing country. As previously discussed, seven enabling factors (exciters) and six inhibiting factors (inhibitors) were identified. The seven exciters of insourcing were resources for training; management skill; technical training for HRMIS technologies; creating a pool of programmers; quality of service; data centralisation; and government support for network infrastructure. The six inhibitors were a lack of recognition; a lack of infrastructure to enable user access; a lack of Java expertise; system complexity; government regulatory policies and negative perceptions from users. The interaction of these factors will influence the decision to insource an IS in the organisation.

This study further discovered three areas of impact: government cost efficiency, access to advanced technology and the skills of internal IT staff. At an organisational level, it is clear that the insourcing of a government IS has a major impact in terms of lowering the costs of systems development and maintenance, whilst at the same time improving the reliability and usability of the system. From the perspective of technology, as a result of the decision to insource the IS, the organisation can now use advanced technology to access the system. From the capabilities perspective, insourcing has clearly enhanced the skills and knowledge of internal IT officers in the public sector.

This research has fully addressed the research questions posed in Chapter 1. Findings from this study have revealed that insourcing a government IS has a positive impact on an organisation, when undertaken as part of a wider IT strategy. These positive impacts are cost efficiency, advances in technology and the improvements in the skills base of the internal staff. These three positive impacts will in turn lead to effective systems development and maintenance, greater sustainability and positive business growth.

## 7.3 RESEARCH LIMITATIONS

In this section, three limitations of this research will be discussed, which should be acknowledged in both the methodological and theoretical aspects of the study.

The first limitation encountered is a limited generalizability to other geographical areas. This study draws almost entirely on the empirical data gathered from the experiences of individuals working for one central government agency in Malaysia, and as a consequence there is a limit to how far the conclusions made here can be applied to insourcing of government IS in other countries, as experiences and approaches in other locales may differ from the Malaysian context.

The second limitation is the limited potential for generalizability from the public sector to the private sector. Given the stated aim of this research, there has been no attempt to collect data relating to the insourcing of an IS in a private organisation, and therefore it is not possible to draw conclusions regarding the

impact of insourcing an IS in the private sector. This research attempts to show that good governance and clear processes for systems development and maintenance are required to meet stakeholders' expectations for the insourcing programme. The study was conducted in a public organisation in order to gain the opinions of a wide range of stakeholders within the context of large-scale systems development and maintenance, with the intention being to demonstrate the reality of insourcing in a public organisation.

The third limitation is the application of the research methodology. As previously outlined, this research applied a qualitative research approach, using open-ended, semi-structured interviews as the main data collection technique. This method has limitations in extending its findings to a wider population, as it cannot provide the same degree of certainty that quantitative analysis can. As different research methods have different advantages and disadvantages, a mixed research method can be applied to complement other methods.

The fourth limitation is regarding the lack of participation from senior government officers in this research. Such participation is crucial in providing an understanding of the wider ICT strategy and the broader direction of the organisation, and in gaining an overview of government policies and regulations from the perspective of the institution in relation to the implementation of the ICT project. However, this study failed to secure such participation, due to a lack of availability and willingness to cooperate in the research. Although interview sessions were originally scheduled, the individuals concerned had to withdraw at short notice due to more pressing commitments.

## 7.4 RESEARCH CONTRIBUTIONS

This research provides a contribution to knowledge at both a theoretical and practical level. From a practical perspective, contributions are made in terms of cost efficiency, access to advanced technology, and the enhancement of the skills and knowledge of internal IT staff, all from the insourcing of a government IS. This research also contributes to the literature by mapping the eight dimensions of the

OPTIMISM model into the capability approach, institutional theory, and technology (ICTs) analytical framework.

### 7.4.1 Contributions to Practice

The results of this research offer important practical implications for IS/IT practitioners and also to governments, to which it makes one key contribution to practice.

The main contribution of this research is highlighting the importance of capacity building of the internal development team. Insourcing of a government IS has a positive impact on capacity building, because the increased budget for training has enhanced the skills and knowledge of the internal development team. In doing so, the organisation has identified and collaborated with appropriate training providers (such as Microsoft) to provide improved training for all members of the internal development team. In addition, the process of knowledge and experience sharing from senior developers to junior developers has also helped to build the capacity of internal development team.

Overall, the research findings provide evidence of the significant impact of that the skills of internal IT/IS practitioners can have when insourcing a government IS. The skills and knowledge of the internal development team under scrutiny in this study not only improved in ASP, ASP.Net, and MySQL programming, but also in JavaScript, PhP, Postgres, Oracle, and Open Source technologies; and as a consequence, the internal development team were able to develop a better system than that originally provided by the vendor: a new system (known as HRMIS2.0) that can be accessed from multiple browsers and platforms.

As a result, the productivity of the internal development team has increased, which has helped the organisation to exploit the use of advanced technology in order to access the system and improve its utility and usability. The adoption of advanced technology can help the organisation to upgrade and expand the existing system in order to secure its longer-term future. Furthermore, the system has the potential to increase staff efficiency, which in turn may also lead to innovation from

internal staff to improve service delivery to public sector staff and the general public, demonstrating that it has a positive impact on the technology, the system in question, and service users.

In addition, this research has also shown that insourcing an IS can have a positive impact on government cost efficiency, which can be viewed as an enabling factor to insource an IS. These results were derived from the combination of the institutions and capabilities framework to analyse and evaluate the insourcing of a government IS. This study found that insourcing is a better approach than outsourcing; because the system is fully controlled by internal staff, and any changes required to the system can be implemented internally without intervention from outside parties. However, it is important to note that insourcing may prove unsuccessful if the necessary capability does not exist, e.g. if system awareness and training are not available or provided.

Indeed, it can be evidenced that as a consequence of insourcing, the cost efficiency in relation to systems development and maintenance is improved, and the organisation can employ advanced technology to access the system, when compared to the system developed and maintained by the vendor, allowing the organisation to devise a training structure that is both more systematic and comprehensive for all internal IT/IS practitioners based in the public sector; and in doing so, it can create more internal IT/IS experts in various IT fields. Training in business processes that is specifically tailored to meet the needs of stakeholders is more likely to be meaningful to the internal staff, and may encourage them to commit more fully to the organisation and thus improve their productivity. In summary, when taken as a whole, it can be seen that the insourcing of a government IS has benefited the Malaysian government.

Previous research undertaken in both Australia (Reynolds & Seddon, 2010) and the USA (Lacity & Willcocks, 2009) has similarly shown these factors to have a positive impact on the organisations under scrutiny, and that the practical contributions outlined here are likely to prove useful to both governmental and private sector organisations interested applying an insourcing approach in their systems development and maintenance.

### 7.4.2 Contributions to Theory

It is hoped that the insights offered by this research will be useful to other researchers interested in studying insourcing of IS, particularly in the public sector. This research contributes to the field of IS by applying a well-established framework to investigate and evaluate the insourcing of a government IS, and in doing so, makes a key contribution to theory.

The enhanced theoretical model introduced in Chapter Three combines institutional theory, the capability approach, technology, and the OPTIMISM model. This enhanced model demonstrates the enabling and inhibiting factors that the insourcing of an IS has encountered, as identified in the empirical data. These factors were themed and examined under three key domains determined to be influential in the process of systems development and implementation; namely, institutional, technological, and capabilities; using a combination of institutional theory, the capability approach and the OPTIMISM model as a theoretical lens. Under the umbrella of these three domains, a number of enabling and inhibiting factors were identified that were impacting upon the insourcing of an IS in the organisation.

The case study then contributed to the extension of these enabling and inhibiting factors by further identifying seven exciters (resources for training; management skills; technical training for HRMIS technologies; creating a pool of programmers; quality of services; data centralisation; and government support for network infrastructure); and six inhibitors (a lack of recognition; negative perceptions from users; a lack of Java expertise; a lack of infrastructure to support user access; system complexity; and restrictive governmental regulatory policies) that interact in the various domains of the analytical framework. This study found that insourcing an IS in a public organisation had a significant impact on the capability building of the internal development team, which in turn helped to improve the quality of the system and to reduce government expenditure.

The enhanced model drawing on the OPTIMISM dimensions captured the key ideas from the bottom-up, and was easier to use and more effective for data analysis when compared with original analytical framework. The usability and utility dimensions provided in the enhanced model are not captured in the original OPTIMISM model. This dimension considers the functionality of the system, including elements such as the user interface, ease of use, system security and stakeholder capabilities and functioning.

## 7.5 LESSONS FOR FUTURE RESEARCH

Research began with the process of data collection in Malaysia. The data collection process was without incident, thanks to good cooperation from the various government agencies and respondents. Although the list of agreed participants was constantly changing, the interview process was largely smooth and was completed within the expected time frame. The seminal nature of this research, along with its range of participants means that it is large in volume, robustness and its richness of data. The multitude of patterns, concepts and categories that emerged as a result of the data gathering process led to an abundance of codes being identified, which made the data analysis process somewhat arduous, due to the sheer amount of data being scrutinised, and this necessitated a longer time period to analyse and interpret the data.

The theoretical framework introduced in this research covers a broad perspective of institutions, capabilities, and technologies. Whilst the original OPTIMISM model is arguably simple and straightforward to apply, it provides limited coverage of multiple perspectives; for example it makes no mention of the perspective of capabilities. The view was taken that the OPTIMISM model could be enhanced by mapping the complexity of institutional theory, the capability approach and technologies (ICTs) onto the analytical framework in order to optimise the process of evaluation, and to monitor the effect of development and implementation of ICT projects in the future.

Fourthly, there is a methodological concern that most interviews (more than 98%) were conducted in Malay language or a mix of Malay language and English. And

yet, the thesis is written in English and English is not my first language. Therefore, the process of translating the mixture of Malay and English or Malay into English was time-consuming and it very challenging.

Fifthly, as I am a practitioner rather than an academic, the academic writing stage was a great challenge for me. Because of that, the writing stage was the most difficult and hardest part to ensure the PhD thesis up to the standard and to demonstrate the novelty of the research. I had become more critical and analytical to deliver and convey the argument so that the reader can comprehend the research has been carried out. The supervisory team also helped me with this process.

It was undoubtedly the right decision to investigate HRMIS; the largest government IS in Malaysia. Although Yin (2014) made a case that the most commonly raised question is "How can you generalise from a single case?" (pp 201), this research provides evidence of the positive impact the insourcing of HRMIS had for both the Malaysian government and users of the system, and therefore the decision to insource HRMIS can provide a benchmark for other government agencies in Malaysia to apply the same approach. Studying HRMIS also demonstrated the reality of insourcing in a public organisation, four years after the termination of the vendor contract, providing empirical information regarding the cause and effect of the strategic approach adopted on the government, internal staff, the development team and users. As a consequence, this study provides a new area to explore for those wanting to discover more about the insourcing of a government IS, as based on the following characteristics, it could be viewed as representative of insourcing in other public sector organisations:

a. Comprised of a large database to store a large information about government employees;
b. A complex system;
c. Strongly link with government policies and regulations.
d. Many active users (approximately 650,000 active users from a total of 1.5 million Malaysian government servants (Woo, 2014)).

As the insourcing of HRMIS is both relatively new and highly complex, it requires a strong strategic response from the government, and therefore a number of factors must be considered before taking such a step. In reality it will take a long time to fully assess the impact of insourcing on systems development, implementation and maintenance.

## 7.6 RECOMMENDATIONS

This research has two key recommendations for governments and other policymakers pursuing the insourcing of a government IS.

The first recommendation is that a systematic and comprehensive training programme should be instituted by the government, with the creation of a proper and comprehensive training road map (TRM), ranging from IT technicians to senior management. In Malaysia, the current TRM programme has only been implemented for IT officers based in the Information Management Division. This programme should be expanded to include all IT officers in the Malaysian government, from which it can then create Subject Matter Experts (SME) in the IS/IT fields. Such a training programme, to be provided by the public training institute or INTAN, should be aligned with the latest technology being utilised in core areas of IT, particularly in government administration, including systems development, big data, networks, security, and open source development.

For although the Malaysian government has developed a set of guidelines to manage ICT expertise in the public sector, as shown in Table 7.1, these guidelines require some improvement, particularly in relation to the need to increase the capabilities of internal IT officers, which currently only emphasise the necessary technical skills, but which fail to address the need for skills in dealing with stakeholders and wider management training, with such competencies also important when managing a large system, particularly in the public sector.

| Category | Areas of Specialisation |
|---|---|
| Systems Development | 1. System Development |
| Technical | 1. ICT Security Management<br>2. Database Management<br>3. Data Centre Management<br>4. Network Management |
| Strategy | 1. ICT Strategic Planning<br>2. Project Management<br>3. Information Management |

Table 7.1: Track Expertise and Areas of Specialization (Source: Bahagian Perkhidmatan, 2010)

It is suggested that the Malaysian government adopt the Skills Framework for the Information Age (SFIA) Version 6 by SFIA Foundation, as this framework would provide a clear set of guidelines designed to enable the organisation to enhance the skills and knowledge of its internal staff. The SFIA framework has been adopted by the UK government to enhance and evaluate the capabilities of its own IT/IS practitioners; and it provides comprehensive guidelines for IT/IS practitioner of all levels, describing the necessary professional skills at various levels of competence (SFIA, 2015). Moreover, this framework concerns not only technical skills, but also wider management competencies – vital skills that all IT/IS practitioners should possess, as shown in Table 7.2.

| Categories | Sub-Categories |
|---|---|
| Strategy and architecture | • Information strategy<br>• Advice and guidance<br>• Business strategy and planning<br>• Technical strategy and planning |
| Change and transformation | • Business change implementation<br>• Business change management |
| Development and implementation | • Systems development<br>• User experience<br>• Installation and integration |
| Delivery and operation | • Service design<br>• Service transition<br>• Service operation |
| Skills and quality | • Skill management<br>• People management<br>• Quality and conformance |
| Relationships and engagement | • Stakeholder management<br>• Sales and marketing |

Table 7.2: Skills Framework for the Information Age (SFIA) Version 6 (Source: SFIA, 2015)

The second recommendation is that government regulators and policy makers in the Malaysian government should be more vigilant when drafting policies relating to software procurement, systems development and implementation, to ensure that the policies adopted will benefit the administration as a whole, including in the state government, statutory bodies, and local authorities. Current policies and regulations are not consistent across all government agencies, especially in the standardisation of software platforms, technology and programming languages. Such standardisation would allow for the more effective implementation of ICT projects, with all government agencies adopting the same software platforms, technology and programming languages. Furthermore, it would also enable senior mangers to formulate and design policies and regulations within government ISs to be both more effective and efficient, and avoid failure of their ICT projects, and with it avoid the huge direct and indirect costs that accompany such failures.

The third recommendation is the establishment of a national IT department within the Malaysian government. There is currently no specific IT department in place to monitor and consolidate ICTs projects across Malaysian public sector organisations. By establishing such a department, the role of IT could become one of the core functions of the government administration. By undertaking a benchmarking exercise of IT departments in other organisations, whether in the private sector or in the public sector in other countries, the Malaysian government could determine the best processes and standards to follow, and terms of reference could then be developed to define the purpose and structure of the putative IT department, to possibly include the department's purpose; the optimum way to model best practice, in order to focus on improving existing e-government and government IS, and to launch new IT services; and the creation of strategic ICTs planning, to achieve the objectives and goals of the organisation. The objectives of the IT department should include utilising ICTs effectively, by improving the infrastructure consolidation, application rationalisation, project value assurance, and following lean IT principles; and taking advantage of all ICTs investment initiatives and recommendations, in order to proceed with robust proposed ICTs projects. The scope and responsibilities of the new IT department should include developing a process to support the standardisation of government ICTs policies and regulations, encouraging all government agencies to adopt the same

technology, software and platforms. By centralising all IT staff, more internal IT experts and a wider R&D team can be recruited and developed, and their career development in the Malaysian government can be more effectively monitored.

## 7.7 FUTURE RESEARCH

There are a number of areas in this study that offer the potential to be expanded upon in future research. Insourcing an information system is a relatively new approach for systems development in the public sector. This research offers a number of valuable insights into one aspect of insourcing an IS, gained from the perspective of systems development and maintenance in the Malaysian government. In order to enrich understanding, three areas of further research have been identified.

Firstly, given the focus of this research on government IS, further research into IT insourcing should be conducted in the area of eGovernment applications, which aim to serve the needs of the general public, especially in large government agencies such as the Ministries of Health, Education or Home Affairs. Investigations into the work of these departments may also serve as a benchmark for other ministries or government agencies looking to insource an IS, offering an analysis of the impact of insourcing across the Malaysian government, which would be valuable not only for public sector organisations in Malaysia, but also for those in other parts of the world, and especially in developing countries. It may be discovered that the same approach to system development and maintenance, can be applied in Malaysia, or even in other countries with similar economic, social or cultural conditions.

Secondly, future research should combine qualitative and quantitative research methods. By combining these two methods the strength of the research findings would be increased, something particularly attractive to policy makers. Comparisons could be made regarding the perception of a phenomenon from two different types of participants. This echoes a suggestion made by Walsham and Sahay (2006), that future researchers can apply a quantitative study with an interpretive viewpoint to robustly triangulate research findings.

Thirdly, future development of this research could once again apply the combination of the OPTIMISM model and the analytical framework to investigate the development and implementation of other IT/IS projects. In addition, the framework introduced here could also be used as a tool to analyse and evaluate the development, implementation or adoption of other ICTs projects in the organisation.

## BIBLIOGRAPHY


Åge, L. 2011, "Grounded theory methodology: positivism, hermeneutics, and pragmatism", *The Qualitative Report,* vol. 16, no. 6, pp. 1599.

Ahmad Nawi, H.S., Azizah, A.R. & Ibrahim, O. 2012, "Government ICT project failure factors: project stakeholders' views", *Journal of Information Systems Research and Innovation,* vol. 2, pp. 69-77.

Ahmad, M. & Othman, R. 2007, "Implementation of Electronic Government in Malaysia: The Status and Potential for Better Service to the Public", *Public Sector ICT Management Review,* vol. 1, no. 1, pp. 2-10.

Ahonen, J.J., Valtanen, A., Savolainen, P., Schalkowski, T. & Kontio, M. 2009, "Outsourcing through Combining Software Departments of Several Companies. ", *In Software Engineering Approaches for Offshore and Outsourced Development, Springer Berlin Heidelberg,* pp. 1-14.

Ahonen, J.J. & Savolainen, P. 2010, "Software engineering projects may fail before they are started: Post-mortem analysis of five cancelled projects", *Journal of Systems and Software,* vol. 83, no. 11, pp. 2175-2187.

Alkire, S. 2008, "Using the Capability Approach: Prospective and Evaluative Analyses", *The Capability Approach: Concepts, Measures and Applications, Cambridge University Press,* pp. 26-50.

Alsudairi, M. & Dwivedi, Y.K. 2010, "A multi-disciplinary profile of IS/IT outsourcing research", *Journal of Enterprise Information Management,* vol. 23, no. 2, pp. 215-258.

Andoh-Baidoo, F.K. 2016, "Organizational Information and Communication Technologies for Development", *Information Technology for Development,* vol. 22, no. 2, pp. 193-204.

Avgerou, C. 2008, "Information systems in developing countries: a critical research review", *Journal of Information Technology,* vol. 23, pp. 133-146.

Avison, D. & Fitzgerald, G. 2008, *Information systems development: methodologies, techniques and tools,* 4th edn, McGraw Hill, Berkshire, United Kingdom.

Bahagian Perkhidmatan 2010, *Garis Panduan Kepakaran ICT Sektor Awam Malaysia,* Jabatan Perkhidmatan Awam Malaysia, Putrajaya, Malaysia.

Bala, H. & Venkatesh, V. 2007, "Assimilation of interorganizational business process standards", *Information systems research,* vol. 18, no. 3, pp. 340-362.

Barney, S., Wohlin, C., Chatzipetrou, P. & Angelis, L. 2011, "Offshore Insourcing: A Case Study on Software Quality Alignment", *6th IEEE International Conference on Global Software Engineering (ICGSE), 2011,* IEEE, pp. 146.

Bass, J.M., Nicholson, B. & Subrahmanian, E. 2013, "A Framework Using Institutional Analysis and the Capability Approach in ICT4D", *Information Technologies & International Development,* vol. 9, no. 1.

Bass, J.M. & Thapa, D. 2014, "Multi-casting in Mountainous Regions of Developing Countries: Analysis through ICT, Institutions, and Capabilities Perspectives", *47th Hawaii International Conference In System Sciences (HICSS), 2014,* IEEE, pp. 3327.

Bass, J. & Heeks, R. 2011, "Changing Computing Curricula in African Universities: Evaluating Progress and Challenges via Design-Reality Gap Analysis", *The Electronic Journal of Information Systems in Developing Countries,* vol. 48, pp. 1-39.

Bekkers, V. & Homburg, V. 2007, "The Myths of E-Government: Looking Beyond the Assumptions of a New and Better Government", *Information Society,* vol. 23, no. 5, pp. 373-382.

Benbasat, I., Goldstein, D.K. & Mead, M. 1987, "The Case Research Strategy in Studies of Information Systems", *MIS Quarterly,* vol. 11, no. 3, pp. 369-386.

Berg, B. & Stylianou, A.C. 2009, "Factors considered when outsourcing an IS system: an empirical examination of the impacts of organizational size, strategy and the object of a decision", *European Journal of Information Systems,* vol. 18, no. 3, pp. 235-248.

Bhagwatwar, A., Hackney, R. & Desouza, K.C. 2011, "Considerations for information systems "backsourcing": a framework for knowledge re-integration", *Information Systems Management,* vol. 28, no. 2, pp. 165-173.

Borman, M. 2006, "Identifying the factors motivating and shaping cosourcing in the financial services sector", *Journal of Information Technology Management,* vol. 17, no. 1, pp. 11-25.

Butler, N., Slack, F. & Walton, J. 2011, "IS/IT Backsourcing - A Case of Outsourcing in Reverse?", *44th Hawaii International Conference on System Sciences (HICSS), 2011,* IEEE Computer Society, pp. 1.

Cannon, A.R. & Woszczynski, A.B. 2002, "Crises and revolutions in information technology: lessons learned from Y2K", *Industrial Management & Data Systems,* vol. 102, no. 6, pp. 318-324.

Charette, R.N. 2005, "Why software fails [software failure]", *Spectrum, IEEE,* vol. 42, no. 9, pp. 42-49.

Charmaz, K. 2006, *Constructing grounded theory: A practical guide through qualitative analysis (Introducing Qualitative Methods Series),* Sage Publications Ltd, London.

Chou, D.C. & Chou, A.Y. 2009, "Information systems outsourcing life cycle and risks analysis", *Computer Standards & Interfaces,* vol. 31, no. 5, pp. 1036-1043.

Collis, J. & Hussey, R. 2009, *Business Research: A Practical Guide for Undergraduate and Postgraduate Students,* 3rd edn, Palgrave Macmillan, Hampshire, United Kingdom.

Cowley, S. 2004, *J.P. Morgan Scraps $5B IT Deal With IBM*, 38th edn, Computerworld, Massachusetts, USA.

Creswell, J.W. 2013, *Qualitative Inquiry and Research Design. Choosing Among Five Approaches,* 3rd edn, SAGE Publications, Thousand Oaks, California, USA.

Creswell, J.W. & Miller, D.L. 2000, "Determining validity in qualitative inquiry", *Theory into practice,* vol. 39, no. 3, pp. 124-130.

Currie, W. 2009, "Contextualising the IT artefact: towards a wider research agenda for IS using institutional theory", *Information Technology & People,* vol. 22, no. 1, pp. 63-77.

Currie, W.L. & Swanson, E.B. 2009, "Special issue on institutional theory in information systems research: contextualizing the IT artefact", *Journal of Information Technology,* vol. 24, no. 4, pp. 283-285.

Dada, D. 2006, "The failure of e-government in developing countries: A literature review", *The Electronic Journal of Information Systems in Developing Countries,* vol. 26, pp. 1-10.

Dahiru, A., Bass, J.M. & Allison, I.K. 2014, "Cloud computing adoption in sub-Saharan Africa: An analysis using institutions and capabilities", *International Conference on Information Society (i-Society) 2014,* IEEE, pp. 98.

Daqing, Z. 2010, "Chinese E-government systems Adoption: from Institutional theory", *International Conference on E-Business and E-Government (ICEE), 2010,* IEEE, pp. 622.

David, F.B., Yuserrie, Z., Au Tin, C., Syed Azizi, W., Sonali, M. & Syed, N. 2007, "Successful IT Outsourcing Engagement: Lessons from Malaysia", *The Electronic Journal on Information Systems in Developing Countries,* vol. 30, no. 5, pp. 1-12.

Deneulin, S. 2006, *The capability approach and the praxis of development,* Palgrave Macmillan, New York, USA.

Deneulin, S. & McGregor, J.A. 2010, "The capability approach and the politics of a social conception of wellbeing", *European Journal of Social Theory,* vol. 13, no. 4, pp. 501-519.

Denscombe, M. 2010, *The Good Research Guide for Small-scale Social Research Projects.* 4th edn, McGraw Hill, Open University Press, New York, USA.

Dhar, S. 2008, "Global IT Outsourcing: Current Trends, Risks, and Cultural Issues" in *Handbook of Research on Global Information Technology Management in the Digital Economy*, ed. M.S. Raisinghani, IGI Global, Pennsylvania, USA, pp. 280-311.

Dibbern, J., Goles, T., Hirschheim, R. & Jayatilaka, B. 2004, "Information systems outsourcing: a survey and analysis of the literature", *ACM Sigmis Database,* vol. 35, no. 4, pp. 6-102.

DiMaggio, P.J. & Powell, W.W. 2000, "The iron cage revisited-Institutional isomorphism and collective rationality in organizational fields (Reprinted from the American Sociological Association vol 48, pg 147-160, 1983)", *ADVANCES IN STRATEGIC MANAGEMENT, VOL 17, 2000,* vol. 17, pp. 143-166.

Dromey, R.G. 1996, "Cornering the chimera", *IEEE Software*, no. 1, pp. 33-43.

Falaleeva, N. 2003, "Antecedents of IS Backsourcing", *Americas Conference on Information Systems* (*AMCIS) 2003,* pp. 3297-3302.

Fan, J. & Niu, H. 2013, "An institutional analysis of national e-government standards diffusion: The case of information resources catalogue and exchange system", *10th International Conference on Service Systems and Service Management (ICSSSM), 2013*IEEE, , pp. 613.

Freytag, P.V., Clarke, A.H. & Evald, M.R. 2012, "Reconsidering outsourcing solutions", *European Management Journal,* vol. 30, no. 2, pp. 99-110.

Gable, G.G. 1994, "Integrating case study and survey research methods: an example in information systems", *European journal of information systems,* vol. 3, no. 2, pp. 112-126.

Gantman, S. 2011, "IT outsourcing in the public sector: A literature analysis", *Journal of Global Information Technology Management,* vol. 14, no. 2, pp. 48-83.

Gauld, R. 2007, "Public sector information system project failures: Lessons from a New Zealand hospital organization", *Government Information Quarterly,* vol. 24, no. 1, pp. 102-114.

Gichoya, D. 2005, "Factors Affecting the Successful Implementation of ICT Projects in Government", *Electronic Journal of E-Government,* vol. 3, no. 4, pp. 175-184.

Gilbert, D., Balestrini, P. & Littleboy, D. 2004, "Barriers and benefits in the adoption of e-government", *International Journal of Public Sector Management,* vol. 17, no. 4, pp. 286-301.

Glaser, B.G. & Strauss, A.L. 1967, *The Discovery of Grounded Theory: Strategies for qualitative research,* Aldine Transaction, USA.

Goles, T., Hawk, S. & Kaiser, K.M. 2008, "Information technology workforce skills: The software and IT services provider perspective", *Information Systems Frontiers,* vol. 10, no. 2, pp. 179-194.

Gonzalez, R., Gasco, J. & Llopis, J. 2006, "Information systems outsourcing: A literature analysis", *Information & Management,* vol. 43, no. 7, pp. 821-834.

Goo, J., Kishore, R., Nam, K., Rao, H.R. & Song, Y. 2007, "An investigation of factors that influence the duration of IT outsourcing relationships", *Decision Support Systems,* vol. 42, no. 4, pp. 2107-2125.

Graham, G. 2008, *Analysing Qualitative Data,* Sage Publications Ltd, London, UK.

Grant, R.M. 1991, "The resource-based theory of competitive advantage: implications for strategy formulation", *California management review,* vol. 33, no. 3, pp. 114-135.

Gupta, B., Dasgupta, S. & Gupta, A. 2008, "Adoption of ICT in a government organization in a developing country: An empirical study", *The Journal of Strategic Information Systems,* vol. 17, no. 2, pp. 140-154.

Harindranath, G. 2008, "ICT in a transition economy: The case of Hungary", *Journal of Global Information Technology Management,* vol. 11, no. 4, pp. 33-55.

Hartley, J. 2004, "Case Study Research" in *Essential Guide to Qualitative Methods in Organizational Research*, eds. C. Cassell & G. Symon, SAGE Publications, California, USA, pp. 323-333.

Hatakka, M. & De, R. 2011, "Development, capabilities and technology: an evaluative framework", *IFIP WG9.4: 11th International Conference on Social Implications of Computers in Developing Countries*International Federation for Information Processing (IFIP), pp. 1 - 12.

Hätönen, J. & Eriksson, T. 2009, "30+ years of research and practice of outsourcing – Exploring the past and anticipating the future", *Journal of International Management,* vol. 15, no. 2, pp. 142-155.

Hawk, S., Kaiser, K.M., Goles, T., Bullen, C.V., Simon, J.C., Beath, C.M., Gallagher, K.P. & Frampton, K. 2012, "The Information Technology Workforce: A Comparison of Critical Skills of Clients and Service Providers", *Information Systems Management,* vol. 29, no. 1, pp. 2-12.

Heeks, R. 2003, *Most eGovernment-for-development projects fail: how can risks be reduced?* Institute for Development Policy and Management, University of Manchester Manchester.

Heeks, R. 2002a, "Information Systems and Developing Countries: Failure, Success, and Local Improvisations", *The Information Society: An International Journal,* vol. 18, no. 2, pp. 101-112.

Heeks, R. 2002b, "Reinventing government in the information age" in *Reinventing government in the information age: International practice in IT-enabled public sector reform*, ed. R. Heeks, Routledge, London, United Kingdom, pp. 9-21.

Heeks, R. & Molla, A. 2009, "Compendium on impact assessment of ICT-for-development projects", *Development Informatics Working Paper Series,* no. 36, pp. 1-158.

Heeks, R. 2010, "Do information and communication technologies (ICTs) contribute to development?", *Journal of International Development,* vol. 22, no. 5, pp. 625-640.

Hirschheim, R. & Lacity, M. 2000, "The myths and realities of information technology insourcing", *Communications of the ACM,* vol. 43, no. 2, pp. 99-107.

Hirschheim, R. & Dibbern, J. 2006, "Information Technology Outsourcing in the New Economy–An Introduction to the Outsourcing and Offshoring Landscape" in *Information Systems Outsourcing,* Springer, Berlin Heidelberg, pp. 3-23.

Hirschheim, R. & Lacity, M.C. 2006, "Four stories of information systems insourcing" in *Information Systems Outsourcing,* Springer, Berlin Heidelberg, pp. 303-346.

Jain Palvia, S.C. 2004, "Global outsourcing of IT and IT enabled services: A framework for choosing an (outsourcee) country", *Journal of Information Technology Case and Application Research,* vol. 6, no. 3, pp. 1-20.

James, J. 2006, "The Internet and poverty in developing countries: Welfare economics versus a functionings-based approach", *Futures,* vol. 38, no. 3, pp. 337-349.

Jayatilaka, B. 2006, "IT Sourcing a Dynamic Phenomena: Forming an Institutional Theory Perspective" in *Information Systems Outsourcing,* Springer, Berlin Heidelberg, pp. 103-134.

Jensen, T.B., Kjærgaard, A. & Svejvig, P. 2009, "Using institutional theory with sensemaking theory: a case study of information system implementation in healthcare", *Journal of Information Technology,* vol. 24, no. 4, pp. 343-353.

Jepperson, R.L. 1991, "Institutions, institutional effects, and institutionalism", *The new institutionalism in organizational analysis,* vol. 6, pp. 143-163.

JPA, 2011, *Transformation of the Malaysian Public Sector Human Resource Management of the 21st Century*, Percetakan Nasional Malaysia Berhad, Kuala Lumpur, Malaysia.

Kalvet, T. 2012, "Innovation: a factor explaining e-government success in Estonia", *Electronic Government, an International Journal,* vol. 9, no. 2, pp. 142-157.

Kern, T. & Willcocks, L. 2002, "Exploring relationships in information technology outsourcing: the interaction approach", *European Journal of Information Systems,* vol. 11, no. 1, pp. 3-19.

Khadaroo, I., Wong, M.S. & Abdullah, A. 2013, "Barriers in local e–government partnership: evidence from Malaysia.", *Electronic Government, An International Journal,* vol. 10, no. 1, pp. 19-33.

Kimaro, H.C. & Sahay, S. 2007, "An institutional perspective on the process of decentralization of health information systems: A case study from Tanzania", *Information Technology for Development,* vol. 13, no. 4, pp. 363-390.

King, J.L., Gurbaxani, V., Kraemer, K.L., McFarlan, F.W., Raman, K. & Yap, C. 1994, "Institutional factors in information technology innovation", *Information systems research,* vol. 5, no. 2, pp. 139-169.

Kivunike, F.N., Ekenberg, L., Danielson, M. & Tusubira, F. 2009, "Investigating perception of the role of ICTs towards the Quality of Life of people in rural communities in Uganda", *Proceedings of the 10th International Conference on Social Implications of Computers in Developing Countries, May. Dubai School of Government,* Dubai School of Government, Dubai, pp. 1 - 19.

Kothari, C. 2004, *Research methodology: Methods and techniques,* 2nd edn, New Age International, New Delhi, India.

Kotlarsky, J. & Bognar, L. 2012, "Understanding the process of backsourcing: two cases of process and product backsourcing in Europe", *Journal of Information Technology Teaching Cases,* vol. 2, no. 2, pp. 79-86.

Lacity, M.C., Solomon, S., Yan, A. & Willcocks, L.P. 2011a, "Business process outsourcing studies: a critical review and research directions<br />", *Journal of Information Technology,* vol. 26, no. 4, pp. 221-258.

Lacity, M.C. & Hirschheim, R. 2012, *The value of selective IT sourcing*, 34th edn, Sloan Management Review, Cambridge, Massachusetts, USA.

Lacity, M.C., Khan, S., Yan, A. & Willcocks, L.P. 2010, "A review of the IT outsourcing empirical literature and future research directions", *Journal of Information Technology,* vol. 25, no. 4, pp. 395-433.

Lacity, M.C. & Willcocks, L.P. 1998, *Strategic sourcing of information systems: perspectives and practices,* John Wiley & Sons, Inc., Indiana, USA.

Lacity, M. & Willcocks, L. 2009, "IT Sourcing: Examining the Privatization Option in Public Administration" in *The Practice of Outsourcing*, eds. M. Lacity & L. Willcocks, Palgrave MacMillan, United Kingdom, pp. 159-186.

Lacity, M.C. & Willcocks, L.P. 1995, "Interpreting information technology sourcing decisions from a transaction cost perspective: Findings and critique", *Accounting, Management and Information Technologies,* vol. 5, no. 3–4, pp. 203-244.

Lacity, M.C., Willcocks, L.P. & Khan, S. 2011b, "Beyond Transaction Cost Economics: Towards an endogenous theory of Information Technology Outsourcing", *The Journal of Strategic Information Systems,* vol. 20, no. 2, pp. 139-157.

Leavitt, H.J. 1965, "Applied organizational change in industry: Structural, technological and humanistic approaches", *Handbook of organizations,* vol. 1144, pp. 1170.

Lee, J., Huynh, M.Q., Kwok, R.C. & Pi, S. 2003, "IT outsourcing evolution---: past, present, and future", *Communications of the ACM,* vol. 46, no. 5, pp. 84-89.

Lessa, L., Negash, S. & Belachew, M. 2012, *Steering e-Goverrnment Projects from Failure to Success: Using Design-Reality Gap Analysis as a Mid-Implementation Assessment Tool* [Homepage of Institute for Development Policy and Management, SED, Manchester, UK], [Online]. Available: http://www.sed.manchester.ac.uk/idpm/research/publications/wp/igovernment/index.htm [2012, October/4].

Marshall, M.N. 1996, "Sampling for qualitative research", *Family practice,* vol. 13, no. 6, pp. 522-525.

Mason, J. 2002, *Qualitative Researching,* 2nd edn, SAGE Publications, London, United Kingdom.

Mason, M. 2010, "Sample size and saturation in PhD studies using qualitative interviews", *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*.

Mat Nayan, N., Zaman, H.B. & Sembuk, T.M.T. 2010, "Defining information system failure in Malaysia: Results from Delphi technique", *International Symposium in Information Technology (ITSim) (Vol.3), 2010,* IEEE, pp. 1616.

Mchombu, K., Evans, G., Bruton, K. & Cocks, A. 2004, *Sharing knowledge for community development and transformation: a handbook*, 2nd edn, DLR International, Canada.

McIvor, R. 2009, "How the transaction cost and resource-based theories of the firm inform outsourcing evaluation", *Journal of Operations Management,* vol. 27, no. 1, pp. 45-63.

McLaughlin, D. & Peppard, J. 2006, "IT backsourcing: from'make or buy'to'bringing it back in-house'.", *The European Conference on Information System (ECIS)*, pp. 1735.

Merriam, S.B. 1998, *Qualitative Research and Case Study Applications in Education. Revised and Expanded from" Case Study Research in Education.".* Jossey-Bass Publishers, San Francisco, California, USA.

Mignerat, M. & Rivard, S. 2009, "Positioning the institutional perspective in information systems research", *Journal of Information Technology,* vol. 24, no. 4, pp. 369-391.

Miles, J.A. 2012, *Management and organization theory: a Jossey-Bass reader,* John Wiley & Sons, San Francisco, USA.

Miles, M.B., Huberman, A.M. & Saldaña, J. 2013, *Qualitative data analysis: A methods sourcebook,* 3rd edn, SAGE Publications, Inc., California, USA.

Milligan, P. & Hutcheson, D. 2006, "Analysis of outsourcing and the impact on business resilience", *IFIP International Working Conference on the Transfer and Diffusion of Information Technology for Organizational Resilience*Springer, Boston, USA, pp. 199.

Moe, N.B., Smite, D. & Hanssen, G.K. 2012, "From offshore outsourcing to offshore insourcing: Three Stories", *In Global Software Engineering (ICGSE), 2012 IEEE Seventh International Conference,* IEEE, August, pp. 1.

Moe, N.B., Šmite, D., Hanssen, G.K. & Barney, H. 2014, "From offshore outsourcing to insourcing and partnerships: four failed outsourcing attempts", *Empirical Software Engineering,* vol. 19, no. 5, pp. 1225-1258.

Moon, J., Jung, G., Chung, M. & Choe, Y.C. 2007, "IT outsourcing for E-government: Lessons from IT outsourcing projects initiated by agricultural organizations of the Korean government", *40th Annual Hawaii International Conference on System Sciences (HICSS), 2007,* IEEE, pp. 104.

Myers, M.D. 1997, "Qualitative Research in Information Systems", *Management System Quarterly,* vol. 21, pp. 241-242.

Myers, M.D. & Newman, M. 2007, "The qualitative interview in IS research: Examining the craft", *Information and Organization,* vol. 17, no. 1, pp. 2-26.

Neuman, W.L. 2014, *Social Research Methods: Qualitative and Quantitative Approaches,* 7th edn, Pearson Education Limited, Essex, United Kingdom.

North, D.C. 1990, *Institutions, Institutional Change and Economic Performance,* Cambridge University Press, UK.

Oates, B.J. 2005, *Researching information systems and computing,* Sage Publication, Inc., London, United Kingdom.

Olatokun, W.M. 2009, "Analysing socio-demographic differences in access and use of ICTs in Nigeria using the capability approach", *Issues in Informing Science and Information Technology,* vol. 6, pp. 479-496.

Oliveira, T. & Martins, M.F. 2011, "Literature review of information technology adoption models at firm level", *The Electronic Journal Information Systems Evaluation,* vol. 14, no. 1, pp. 110-121.

Omar, A., Bass, J.M., Lowit, P., (2016). Exploring the Factors that Influence the Success of Insourced Government ICT Projects. *The Electronic Journal of Information Systems in Developing Countries,* vol. 77, no. 5, pp. 1 - 22.

Omar, A., Bass, J.M. and Lowit, P., (2015). Insourcing a Government Information System: An Analysis using Institutions and the Capability Approach. *Information Society (i-Society), 2015 International Conference on Information Society (i-Society 2015)*, Technical Co-Sponsored by IEE UK/I Computer Chapter, London, United Kingdom. pp. 91 – 96.

Omar, A., Bass, J.M., Lowit, P., (2015). Insourcing a Government Information System: A Case Study. *13th International Conference on Social Implications in Developing Countries*, Negombo, Sri Lanka. pp. 198 – 210.

Omar, A., Bass, J.M., Lowit, P., (2014). A Grounded Theory of Open Government Data: A Case Study in the UK. *18th UKAIS International Conference on Information System*, Oxford, United Kingdom. pp. 1 - 23.

Oosterlaken, I. 2009, "Design for development: A capability approach", *Design Issues,* vol. 25, no. 4, pp. 91-102.

Opdenakker, R. 2006, "Advantages and disadvantages of four interview techniques in qualitative research", *Qualitative Research Forum,* [Online], vol. 7, no. 4, pp. 1-9. Available from: http://www.qualitative-research.net/index.php/fqs/article/view/175/391%3E. [15th October 2015].

Oshri, I., Kotlarsky, J. & Willcocks, L. 2009, *The Handbook of Global Outsourcing and Offshoring,* Palgrave Macmillan, New York, USA.

Othman, R. & Rahmat, A.R. 2005, "The analysis of electronic government blueprint for implementation towards the actual e-government implementation", *International Conference and Exhibition In Knowledge Management*, pp. 487.

Parikh, M.A. 2002, "Knowledge acquisition through case study development: a student researcher perspective", *Communications of the Association for Information Systems,* vol. 8, no. 1, pp. 25.

Park, J. & Kim, J.S. 2005, "The impact of IS sourcing type on service quality and maintenance efforts", *Information & Management,* vol. 42, no. 2, pp. 261-274.

Patton, M.Q. 2002, *Qualitative Research and Evaluation Methods,* 3rd edn, SAGE Publications, Inc., California, USA.

Piotti, B., Chilundo, B. & Sahay, S. 2006, "An Institutional Perspective on Health Sector Reforms and the Process of Reframing Health Information Systems Case Study From Mozambique", *The Journal of applied behavioral science,* vol. 42, no. 1, pp. 91-109.

Platz, L.A. & Temponi, C. 2007, "Defining the most desirable outsourcing contract between customer and vendor", *Management decision,* vol. 45, no. 10, pp. 1656-1666.

Posthuma, R.A. 2009, "National culture and union membership: A cultural-cognitive perspective", *Relations Industrielles/Industrial Relations,* vol. 64, no. 3, pp. 507-529.

Qu, W.G., Oh, W. & Pinsonneault, A. 2010, "The strategic value of IT insourcing: An IT-enabled business process perspective", *The Journal of Strategic Information Systems,* vol. 19, no. 2, pp. 96-108.

Rai, A., Maruping, L.M. & Venkatesh, V. 2009, "Offshore information systems project success: the role of social embeddedness and cultural characteristics", *MIS quarterly,* vol. 33, no. 3, pp. 617-641.

Raisinghani, M.S., Starr, B., Hickerson, B., Morrison, M. & Howard, M. 2008, "Information technology/systems offshore outsourcing: key risks and success factors", *Journal of information technology research,* vol. 1, no. 1, pp. 72.

Reynolds, P. & Seddon, P.B. 2010, ""Betting on the House": Value Creation by Insourcing at Crown Limited.", *Pacific Asia Conference on Information Systems (PACIS)*AIS Electronic Library (AISeL), pp. 1987.

Ritchie, J., Lewis, J., Nicholls, C.M. & Ormston, R. 2013, *Qualitative research practice: A guide for social science students and researchers,* 2nd edn, SAGE Publications, Inc., London, United Kingdom.

Robey, D. & Boudreau, M. 1999, "Accounting for the contradictory organizational consequences of information technology: Theoretical directions and methodological implications", *Information systems research,* vol. 10, no. 2, pp. 167-185.

Robeyns, I. 2009, "The Capability Approach" in *Handbook of Economics and Ethics*, eds. P. Jan & I. van Staveren, Edward Elgar Publishings, Cheltenham, United Kingdom, pp. 39.

Robeyns, I. 2005, "The Capability Approach: a theoretical survey", *Journal of Human Development,* vol. 6, no. 1, pp. 93-117.

Robson, C. 2011, *Real World Research: A Resource for Users of Social Research Methods in Applied Settings,* 3rd edn, John Wiley and Sons Ltd, West Sussex, United Kingdom.

Rossignoli, C. & Ricciardi, F. 2015, "Theories Explaining Inter-Organizational Relationships in Terms of Coordination and Control Needs" in *Inter-Organizational Relationships Towards a Dynamic Model for Understanding Business Network Performance* Springer International Publishing Switzerland, Switzerland, pp. 7-36.

Runeson, P. & Höst, M. 2009, "Guidelines for conducting and reporting case study research in software engineering", *Empirical software engineering,* vol. 14, no. 2, pp. 131-164.

Salge, C. 2015, "Pulling the Outside In: A Transactional Cost Perspective on IT Insourcing", *Twenty-first Americas Conference on Information Systems*AIS Electronic Library, Puerto Rico, pp. 1 - 11.

Schniederjans, M.J., Schniederjans, A.M. & Schniederjans, D.G. 2005, *Outsourcing and insourcing in an international context,* ME Sharpe, New York, USA.

Scott, W.R. 2013, *Institutions and organizations: Ideas, interests, and identities,* 4th edn, Sage Publications, California, USA.

Scott, W.R. 2008, *Institutions and Organizations: Ideas and Interest,* SAGE Publications, Inc., California, USA.

Sen, A. 2005, "Human rights and capabilities", *Journal of Human Development,* vol. 6, no. 2, pp. 151-166.

Sen, A. 1999, *Development as freedom,* Oxford University Press, Oxford, United Kingdom.

Sen, A. 1990, "Development as capability expansion" in *The Community Development Reader*, eds. J. Defilippis & S. Saegert, 2nd edn, Routledge, Taylor & Francis Group, New York, USA, pp. 41-58.

Sen, A. 1987, *On ethics and economics,* Blackwell Publishing, Victoria, Australia.

SFIA 2015, *Skills Framework for the Information Age version 6* [Homepage of SFIA Foundation], [Online]. Available: http://www.sfia-online.org/en/sfia-6/documentation [2016, February/25].

Sikula Sr, A., Kim, C.W., Braun, C.K. & Sikula, J. 2010, "Insourcing: Reversing American Outsourcing in the New World Economy", *Management, Marketing and MIS at Marshall Digital Scholar,* vol. 71, no. 8, pp. 3-9.

Singh, S. & Zack, M.H. 2006, "Information Technology Outsourcing: Reducing Costs or knowledge?", *International Conference on Organizational Learning, Knowledge and Capabilities (OLKC'06)*, pp. 1 - 31.

Solli-Sæther, H. & Gottschalk, P. 2015, "Stages-of-growth in outsourcing, offshoring and backsourcing: Back to the future?", *Journal of Computer Information Systems,* vol. 55, no. 2, pp. 88-94.

Stacie, P., William, D. & Ephraim, M. 2008, "Measuring information systems success: models, dimensions, measures, and interrelationships", *European Journal of Information Systems,* vol. 17, no. 3, pp. 236-263.

Stahl, B.C. 2008, "The ethical nature of critical research in information systems", *Information Systems Journal,* vol. 18, no. 2, pp. 137-163.

Stea, B. & Harindranath, G. 2006, "Public sector ICT management strategy and its impact on e-government: a case study.", *ECIS (the Educational Collaborative for International Schools)*, pp. 1117.

Stern, P.N. 1994, "Eroding grounded theory" in *Critical Issues in Qualitative Research Methods* SAGE Publications, Inc., California, USA, pp. 212-223.

Strauss, A.L. & Corbin, J.M. 1998, *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory,* 2nd edn, SAGE Publications, Inc., California, USA.

Strong, D.M. & Volkoff, O. 2010, "Understanding Organization—Enterprise System Fit: A Path to Theorizing the Information Technology Artifact", *MIS quarterly,* vol. 34, no. 4, pp. 731-756.

Suddaby, R. 2010, "Challenges for institutional theory", *Journal of Management Inquiry,* vol. 19, no. 1, pp. 14-20.

Sundgren, B. 2005, "What Is a Public Information System?", *International Journal of Public Information Systems,* vol. 2005, no. 1, pp. 81-99.

TechTarget 2016, 2016-last update*, ICT (information and communications technology - or technologies)* [Homepage of TechTarget Incorporation], [Online]. Available: http://searchcio.techtarget.com/definition/ICT-information-and-communications-technology-or-technologies [2016, May/12].

Teo, H., Wei, K.K. & Benbasat, I. 2003, "Predicting intention to adopt interorganizational linkages: An institutional perspective", *MIS quarterly,* vol. 27, no. 1, pp. 19-49.

Thapa, D., Sein, M.K. & Sæbø, Ø 2012, "Building collective capabilities through ICT in a mountain region of Nepal: where social capital leads to collective action", *Information Technology for Development,* vol. 18, no. 1, pp. 5-22.

Thomas, G. & Fernández, W. 2008, "Success in IT projects: A matter of definition?", *International Journal of Project Management,* vol. 26, no. 7, pp. 733-742.

Tsai, W., Leu, J., Liu, J., Lin, S. & Shaw, M.J. 2010, "A MCDM approach for sourcing strategy mix decision in IT projects", *Expert Systems with Applications,* vol. 37, no. 5, pp. 3870-3886.

UNESCAP 2016, 5th May 2016-last update*, ICT Indicator* [Homepage of The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)], [Online]. Available: http://www.unescap.org/our-work/ict-disaster-risk-reduction/ict-indicators/about [2016, May/2016].

United Nations 2016, *E-Government Survey 2016: E-Government in Support of Sustainable Development*, United Nations Department of Economic and Social Affairs, New York, USA.

Valenzuela, D. & Shrivastava, P. 2008, "Interview as a method for qualitative research", *Southern Cross University and the Southern Cross Institute of Action Research (SCIAR),* pp. 1-89.

Veltri, N.F., Saunders, C.S. & Kavan, C.B. 2008, "Information systems backsourcing: correcting problems and responding to opportunities", *California management review,* vol. 51, no. 1, pp. 50-76.

Vitharana, P. & Dharwadkar, R. 2007, "Information Systems Outsourcing: Linking Transaction Cost and Institutional Theories", *Communications of the Association for Information Systems,* vol. 20, pp. 346-370.

Walker, D. & Myrick, F. 2006, "Grounded theory: an exploration of process and procedure", *Qualitative health research,* vol. 16, no. 4, pp. 547-559.

Walsham, G. 2010, "ICTs for the broader development of India: An analysis of the literature", *The Electronic Journal of Information Systems in Developing Countries,* vol. 41, no. 4, pp. 1-20.

Walsham, G. 1993, *Interpreting information systems in organizations,* John Wiley & Sons, Inc., New York, USA.

Walsham, G. 1995, "Interpretive case studies in IS research: nature and method.", *European Journal of information systems,* vol. 4, no. 2, pp. 74-81.

Walsham, G. & Sahay, S. 2006, "Research on information systems in developing countries: Current landscape and future prospects", *Information Technology for Development,* vol. 12, no. 1, pp. 7-24.

Weerakkody, V., Dwivedi, Y.K. & Irani, Z. 2009, "The diffusion and use of institutional theory: a cross-disciplinary longitudinal literature survey", *Journal of Information Technology,* vol. 24, no. 4, pp. 354-368.

Whitten, D. & Leidner, D. 2006, "Bringing IT back: An analysis of the decision to backsource or switch vendors", *Decision Sciences,* vol. 37, no. 4, pp. 605-621.

Whitten, D., Chakrabarty, S. & Wakefield, R. 2010, "The strategic choice to continue outsourcing, switch vendors, or backsource: Do switching costs matter?", *Information & Management,* vol. 47, no. 3, pp. 167-175.

Wong, S.F. 2008, "Understanding IT backsourcing decision", *Pacific Asia Conference on Information Systems (PACIS) 2008*AIS Electronic Library (AISel), pp. 226.

Woo, K.H. 2014, "Recruitment Practices in the Malaysian Public Sector: Innovations or Political Responses?", *Journal of Public Affairs Education,* vol. 21, no. 2, pp. 229-246.

Wright, M.K. & Capps III, C.J. 2010, "Information systems development project performance in the 21st century", *ACM SIGSOFT Software Engineering Notes,* vol. 35, no. 2, pp. 1-10.

Yeoh, W. & Koronios, A. 2010, "Critical success factors for business intelligence systems", *Journal of computer information systems,* vol. 50, no. 3, pp. 23-32.

Yin, R.K. 2014, *Case Study Research: Design and Methods,* 5th edn, SAGE Publications, Inc., California, USA.

Žabjek, D., Kovacic, A. & Indihar Štemberger, M. 2009, "The influence of business process management and some other CSFs on successful ERP implementation", *Business Process Management Journal,* vol. 15, no. 4, pp. 588-608.

Zheng, Y. & Walsham, G. 2008, "Inequality of what? Social exclusion in the e-society as capability deprivation", *Information Technology & People,* vol. 21, no. 3, pp. 222-243.

Zheng, Y. 2009, "Different spaces for e-development: What can we learn from the capability approach?", *Information Technology for Development,* vol. 15, no. 2, pp. 66-82.

Zheng, Y. 2007, *Exploring the value of the capability approach for E-development,* London School of Economics, London, United Kingdom.

Zwieg, P., Kaiser, K.M., Beath, C.M., Bullen, C., Gallagher, K.P., Goles, T., Howland, J., Simon, J.C., Abbott, P. & Abraham, T. 2006, "The Information Technology Workforce: Trends and Implications 2005-2008", *MIS Quarterly Executive,* vol. 5, no. 2, pp. 47-54.

# APPENDIX 1 – LIST OF JOURNALS CONSULTED

**IS Journals consulted include but were not limited to:**

MISQ – Management Information Systems Quarterly

ISJ – Information Systems Journal

JMIS – Journal of Management Information System

JSIS – Journal of Strategic Information System

ISM – Information Systems Management

ISO – Journal of Information Systems Outsourcing

IMJ – Information & Management Journal

GITM – Journal of Global Information Technology Management

**ICT4D journals consulted include but were not limited to:**

ICTD – Information and Communication Technologies and Development

ITID – Information Technologies & International Development

EJISDC – Electronic Journal of Information Systems in Developing Countries

ITD – Information Technology for Development

## APPENDIX 2 – LIST OF USER PARTICIPANT'S ORGANISATION

| NO. | USER PARTICIPANT | JOB TITLE | ORGANISATION |
|---|---|---|---|
| 1 | User1 | Assistant Officer | Ministry A in Putrajaya |
| 2 | User2 | Clerk | Government Agency A in Putrajaya |
| 3 | User3 | Director | State Agency in Negeri Sembilan |
| 4 | User4 | Clerk | Ministry B in Kuala Lumpur |
| 5 | User5 | Senior Management Officer | Ministry B in Putrajaya |
| 6 | User6 | Senior Management Officer | Ministry C in Kuala Lumpur |
| 7 | User7 | Management Officer | Government Agency B in Putrajaya |
| 8 | User8 | IT Technician | Government Agency C in Putrajaya |
| 9 | User9 | Management Officer | Government Agency A in Putrajaya |
| 10 | User10 | Teacher | School A in Shah Alam, Selangor |
| 11 | User11 | Management Officer | Government Agency B in Putrajaya |
| 12 | User12 | Clerk | Ministry D in Putrajaya |
| 13 | User13 | Senior Management Officer | Ministry E in Putrajaya |
| 14 | User14 | State Officer (Management) | State Agency in Selangor |

# APPENDIX 3 – INTERVIEW GUIDE 1

## Interview Guide (First Data Collection)

**Technology Perspective**

**Management Group**

- First of all, I would like to know when the e-government system in the organisation has started.
- How the technology in e-government systems has helped to achieve your goals?
- What is your plan for the next five years in e-government system?
- How many people in your department are working with the technologies in relation with e-government systems?
- You've probably had some interesting positive experiences dealing with e-government system design, implementation and deployment. Could you tell me about some of them while dealing with e-government open data system design, implementation and deployment?
- Management – coordination, team work, budget

**Technical/Developer Group**

- First of all, I would like to know when the e-government system in the organisation has started.
- How do you use technologies to help meet your business goals?
- How have the technologies evolved over the last few years?
- What technology plans do you have over the next 5 years?
- How many people in your department are working with the technologies in relation with e-government systems?
- You've probably had some interesting positive experiences dealing with e-government open data system design, implementation and deployment. Could you tell me about some of them while dealing with e-government system design, implementation and deployment?
  - The hardware
  - The software
  - The network technologies

- The database technologies.

- How about the challenges?
- How have you tried to address these challenges?
- What challenges remain to be resolved?
- What kind of project development practices are being used in e-government project?

**Staff/Clerical Group**

- What do you think about the existing computer system to support e-government systems?
- What special skills and knowledge do you gained in handling the e-government systems?
- How many people in your department are working with the technologies in relation with e-government systems?

**Functionings Capabilities Perspectives**

**Management Group**

- What are the most important lessons you personally have learned from your involvement in e-government systems design, implementation and deployment?
- Let me ask you now about some of your feelings about the e-government open data. What are some of the things that you have really liked about the e-government system?
- What about dislikes? What are some things you do not like about the e-government system?
- Describe your roles in designing, implementing and deploying the e-government systems.
- I would like to ask you about your recommendations for the e-government systems. If you had the power to change things about the e-government systems, what would you make different?
- How do you see the e-government system meeting the need of Malaysian Government?

- How do you see the open data meeting the need of the general public as well as for civil servants?
- What kind of training do you provide for the staff in handling the e-government systems?
  a) How does learning take place within the team?
  b) How does learning take place for you personally?

**Technical/Developer Group**

- What are the most important lessons you personally have learned from your involvement in e-government systems design, implementation and deployment?
- Describe your roles in designing, implementing and deploying the e-government systems.
- I would like to ask you about your recommendations for the e-government open data. If you had the power to change things about the e-government open data, what would you make different?
- What kind of training do you get in handling the e-government systems?
  a) How does learning take place within the team?
  b) How does learning take place for you personally?

**Staff/Clerical Group**

- What are the most important lessons you personally have learned from your involvement in e-government systems design, implementation and deployment?
- Let me ask you now about some of your feelings about the e-government open data. What are some of the things that you have really liked about the e-government systems?
- What about dislikes? What are some things you do not like about the e-government systems?
- Describe your roles in designing, implementing and deploying the e-government systems.
- I would like to ask you about your recommendations for the e-government open data. If you had the power to change things about the e-government open data, what would you make different?

- What kind of training do you get in handling the e-government systems?
- How does the learning process take place for you personally?
- Which are the areas you would be most interested in getting additional training for e-government systems?
- What kind of guidance do you get from the management?

**Institutions Perspective**

**Management Group**

- So far, what is the greatest accomplishment for handling the e-government open data system?
- Based on your experience, what would you say are the strength of the e-government open data system?
- What about the weaknesses?
- How effective do you think the e-government open data system is?
- How about the acceptance of the e-government systems by civil servants?
- Describe your responsibilities in designing, implementing and deploying the e-government systems.
- From your experience, what are the factors that will encourage the organisation to implement the e-government open data system?
- How about the discourage factors?
- Based on your experience, what are the challenges faced in the implementation of the e-Government?

**Technical/Developer**

- So far, what is the greatest accomplishment for handling the e-government open data system?
- Based on your experience, what would you say are the strength of the e-government systems?
- What about the weaknesses?
- How effective do you think the e-government systems is?
- How about the acceptance of the e-government systems by civil servants?
- Describe your responsibilities in designing, implementing and deploying the e-government systems.

- From your experience, what are the factors that will encourage the organisation to implement the e-government systems?
- How about the discourage factors?
- Based on your experience, what are the challenges faced in the implementation of the e-Government?

**Staff/Clerical Group**

- So far, what is the greatest accomplishment for handling the e-government open data system?
- Based on your experience, what would you say are the strength of the e-government open data system?
- What about the weaknesses?
- How effective do you think the e-government system is?
- How about the acceptance of the e-government systems by civil servants?
- From your experience, what are the factors that will encourage the organisation to implement the e-government systems?
- How about the discourage factors?
- Based on your experience, what are the challenges faced in handling the e-Government?

**Any other comments**

Do you have any further comments in relation to the design/implementation/deployment of e-government systems?

**About Your Organisation**

- What is the name of your department?
- How many people are there in your department?
- What is the size of this organisation?

**About You**

- Your name?
- Your age?
- What is your role (management, technical/developer, staff)?
- What experience or formal qualifications do you have?

- How much experience do you have or when did you qualify?
- How long have you been working in your current organisation?

# APPENDIX 4 – INTERVIEW GUIDE 2

## Interview Guide (Second Data Collection)

**Objectives and Values Perspective**

- First of all, I would like to know: How does the existing of information systems planning helps to achieve the goal and mission of the organisation?
- What are some of the pitfalls when an information system strategy/planning is poorly executed?
- In your viewpoint, why do you think that Malaysia is concerned with implementing the Government Information System?
- To what extent do you think the current procedures and standards contribute to project success?
- What do you think are the important factors that contribute to the success of a government information system?
- What are the major barriers to implementing a government information system in Malaysia?
- Have you faced any problems in dealing with government routines and procedures during the development or implementation of the system? If so, what is it?
- What are the challenges that lie ahead?
- Do you think that government information system can increase the transparency of government procedures? How?

**Process Perspective**

- What is the method being used for the development and implementation of the system in the organisation?
- What process has been used up to the present to implement a government information system in Malaysia? Has this changed over time, and if so, why?

**Technology Perspective**

- What is your opinion about the current technology being used in the system?
- Which of the emerging technologies do you think has the greatest potential for your organisation?
- What limitations are there on the use of new technologies?

- What issues do you foresee in relation to existing infrastructure, including legacy systems?
- Based on the current situation, what is your opinion about the ICT infrastructure in the government offices as a whole?

**Information Perspective**

- How often do you purge information?
- What are the key activities within your organisation?
- What information is needed to execute these activities?

**Management Systems and Structure Perspective**

- Can you describe the organisation structure?
- What do you think about the current organisation structure compared to the previous?

**Investment Resources Perspective**

- What do you think about the budget of the system?
- Have any new investment taken place as a result of commencing the government information system implementation?
- How long does it take to solve the problem that being raised by the user?

**Staffing and Skills Perspective**

- How many people are on your team?
- How many programmers do you need for system development?
- How is the skill level of IT officers/programmers?
- What types of training have you been given recently and how was this provided?
- How do you usually train internal and any external users?
- Do you think that government information system will change the behavior and practice of users within government offices? If so, how?

**Milieu Perspective**

- What do you think about the changes of top management in the public sector?

- What do you think about the changes of government administration in the public sector?
- What about the user acceptance of systems that have been developed?
- What do you suggest for future research for government information system in Malaysia?
- What are the most common problems reported about the system?
- Given the ongoing global economic problems, what is the immediate outlook for the government information system?

**Any other comments**

- Do you have any further comments in relation to the development and implementation of government information system?

**About Your Organisation**

- What is the name of your department?
- How many people are there in your department?
- What is the size of this organisation?

**About You**

- Your name?
- Your age?
- What is your role (management, technical/developer,staff)?
- What experience or formal qualifications do you have?
- How much experience do you have or when did you qualify?
- How long have you been working in your current organisation?

## APPENDIX 5 – DETAILS OF DATA ANALYSIS

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| **System Complexity** | Large system<br><br>Large data<br><br>Many modules<br><br>Embedded with government circular and policies<br><br>Combine all the systems<br><br>Integrate with other agencies<br><br>Obsolete technology<br><br>Old version of programming language<br><br>Outdated Technology<br><br>Complicated System<br><br>System Integration<br><br>System Migration | [Respondent 1]:"*The system is too complex*"<br>[Respondent 5]: *"Any changes in the circular or policies, we have to change the process in HRMIS accordingly"*<br>[Respondent 5]: *"The problem of the system in Malaysia, every ministry wants to develop their own system, and they don't want to share or integrate with other."*<br>[Respondent 7]: "*there are some systems that we can integrate*"<br>[Respondent 8]: "*HRMIS is a national system which every government agency in Malaysia will use it. So, I think HRMIS is the largest information system in the Malaysian government.*"<br>[Respondent 16]: "*HRMIS is an outdated system in term of technology itself*"<br>Respondent 17]: *"Different ministry used different platform or software. That's why we as the technical people have difficulty to integrate the system… maybe because they have a contract with the vendor and they cannot change the technology or platform."*<br>[Respondent 23]: *"Maybe they [government agencies] don't have the capacity to integrate the system or they don't want to upgrade their system… and MAMPU is not trying to understand the limitation faced by the agencies because MAMPU just gives orders without study the consequences. Another thing is about budget because MAMPU only provides the platform, but how to proceed, the agencies have to come out with their own* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | *budget and the agencies have a limited budget to implement."*<br>[Respondent 30]: "*we still use the old version of programming language*"<br>[Respondent 32]: "*We still use the old technology*"<br>[Respondent 34]: "*Now HRMIS is web-based with the large database*"<br>[Respondent 39]: "*we will migrate the system [HRMIS] to JavaScript"*<br>[Respondent 40]: "*The systems are large and good, but they are not communicating with another system. For example, in this ministry, the systems might not communicate with another ministry."*<br>[Respondent 41]: "*the system is not compatible with other system"*<br>[Respondent 42]: "*Users have raised up the issue so many times, but the system still not integrated*"<br>[Respondent 43]: "*Public has complained about the system in the government because the systems are not integrated… they have to go to many places (ministries) to get a service from the government, they want a system that integrated to all main services."*<br>[Respondent 46]: "*The government need to develop an integrated system that links to all government agencies such as the National Registration Department, Police, Treasury, Customs Department, Housing Loans and so forth… even in this ministry, they have so many systems and if possible, we want just one system that integrates all the systems."*<br>[Respondent 50]: "*The whole organisation needs to be ready to* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | *develop the system internally, not only for application but they have to know about the maintenance and servers such as servers setting and server configuration."*<br>[Respondent 51]: *"HRMIS is quite complicated because the system starts from the appointment date until retirement date of the officer… the data keeps increasing but never reduced. Although the officer has retired from the government, we cannot delete the data until the death of that officer and we cannot find any other system like HRMIS."*<br>[Respondent 56]: *"If you compared a system at the other agencies or ministries, they have a leave management system as one system and a payroll system as one system, but for HRMIS, we called it as a module which each module has a few sub-modules… each sub-module can be representing as a complete system."*<br>[Respondent 57]: *"Actually, it's quite complicated even when we are talking about a module. For me, a single module can represent a complete system. Even though the last part of the module is maintenance sub-module which the staffing specialist will use that module, but they have to do the maintenance for Heads of Service for each service, service classification and so on and the sub-module itself has about 60 screens to maintain."* |
| **Lack of Infrastructure to Support User Access** | Rural area<br><br>Remote area<br><br>Network Disrupted<br><br>Power outage | [Respondent 1]: *"There are some agencies still use the outdated ICT equipment and technology especially small agencies and agencies in the rural or remote areas."*<br>[Respondent 2]: *"sometimes there was an interruption of* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | Outdated technology | *network either from the EGNet line or the network provided by Malaysian Administrative Modernisation and Management Planning Unit (MAMPU)"*<br>[Respondent 13]: *"Sometimes they [government office in Sabah and Sarawak] had to reboot the servers a few times because of power outage."*<br>[Respondent 16]: *"The infrastructure, especially in the ministry [headquarter] is good but how about the infrastructure in the rural or remote area?."*<br>[Respondent 43]: *"Users in the state agencies are having difficulty to access the system compared to the others in the federal agencies."*<br>[Respondent 51]: *"They [government agencies] blamed us because they cannot access HRMIS but when we investigate the problem, the problem is actually caused by their network."*<br>[Respondent 59]: *"It does not mean HRMIS failed, but maybe because of the network disrupted."*<br>[Respondent 65]: *"They are still using the desktop with big CRT and slow RAM… the agency needs to take action on this matter; we cannot do anything."*<br>[Respondent 66]: *"The PC [personal computer], laptop and even a server in the HQ [headquarters] are using the latest technology but in the state or small agencies, I think the technology used is not the latest… there is a huge gap between the state and the HQ."* |
| **Technical Training for HRMIS Technologies** | Knowledge sharing session<br><br>Experience sharing session | [Respondent8]: *"We do a knowledge sharing session among us (internal officers)"*<br>[Respondent 9]: *"Knowledge sharing session among the* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | Multitasking job<br><br>Training of trainer (TOT)<br><br>HRMIS Technology<br><br>Joint-venture collaboration | *officers is a good strategy to enhance our technical skill and knowledge, especially in HRMIS technology."*<br>[Respondent20]: "*Senior programmers who are expert, they will conduct a training of trainer (TOT) to junior programmers*"<br>[Respondent 30]: "*What we have done to improve our skills and knowledge in programming language is we did a knowledge sharing among the programmers. Even though some of them are junior programmers, sometimes they know what we do not know because they have experience in private sector before they joined the public sector."*<br>[Respondent 33]: "*We get the expertise from outside, or we do joint-venture development*"<br>[Respondent 30]: "*The courses and training provided by INTAN more focuses on HRMIS technology such as SQL, ASP and ASP.Net in Microsoft products. Maybe INTAN should provide other courses like Open Source, PhP or Phyton."*<br>[Respondent 32]: "*Under system development of the vendor, our roles are similar to a SA [System Analyst]. We have to study the system user requirement, do the system analysis and system design. But, now, we are only focus and concentrate on system development and programming skill."*<br>[Respondent 32]: "*Training was more towards to Microsoft products such as SQL, ASP and ASP.Net."*<br>[Respondent 33]: "*We [programmers] learnt about HTML5, Cascading Style Sheets (CSS) and JavaScript for a week."* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | [Respondent 50]: *"When we have to do it by our-self, we have to survive… so, we improve ourselves."*<br>[Respondent 54]: *"Their [programmers] skill is enhanced by doing a lot of programming."*<br>[Respondent 55]: *"Our technical skill and knowledge have improved a lot. If we have a problem or new issue, we have to solve the problem... by hook or by crook, we have to solve it either asking our friend within the organisation or from another agency, or we have to search from the internet or to ask from the experienced people."*<br>[Respondent 56]: *"For the next second submission of HRMIS2.0, most of the modules developed by our programmers because they already understand the chronology of HRMIS."*<br>[Respondent 57]: *"They [programmers] developed HRMIS2.0 internally. I can see lots of improvement and I think this organisation has some experts in programming."* |
| **Lack of Java Expertise** | Lack of System Architecture<br><br>Lack of System Design Expert<br><br>Depends on the vendor<br><br>Lack of R&D Experts | [Respondent 24]: *"We still depend on the vendor to see the whole system in the government because it's hard to find an expert in System Architecture and System Design."*<br>[Respondent 30]: *"We don't have an expert in JavaScript… So far, most programmers are only expert in ASP and ASP.Net".*<br>[Respondent 31]: *"We are still in the process of learning the JavaScript, but the top management wanted us to complete the system in a short time. However, we can't do it because a lack of expert in JavaScript."* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | [Respondent 33]: *"[Top management] has proposed to use totally Java [JavaScript] for a new system. But, we don't have an expert in JavaScript and yet, we can't find an expert to guide and train us."* [Respondent 39]: *"we are still new in the Java Script… still in the learning process."* [Respondent 50]: *"What I can see right now, we are lacking of expert, especially expert in system architecture design that can see the whole system."* [Respondent 57]: *"For my module [Organisational Development]… there is no expert in this module and none of the officers in this organisation know about the workflow and process of this module."* [Respondent 67]: *"If the establishment of the IT department becomes a reality, there is a chance to create an R&D team where there will be many experts and consultants".* *"We need a team like R&D (Research and Development) team, just like in a manufacturing sector. Because we are a lack of expert in R&D or expert in system analyst, system design or system designer that know everything about the system."* |
| **Quality of Services** | Bad performance<br><br>Slow response time<br><br>User Interface<br><br>Single browser<br><br>System Performance<br><br>Web-based system<br><br>Internet access | [Respondent 4]: *"So many user complaints about the system because too many buttons to clicks."* [Respondent 29]: *"the system [HRMIS] is not interactive, not user-friendly"* [Respondent 18]: *"like HRMIS, it only for IE (Internet Explore) and not for other browsers"* [Respondent 35]: *"HRMIS is good now, the system is much faster compared the old system."* [Respondent 35]: *"We can access* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | Online System<br><br>Coding Enhancement | *the system at home… It is easy; we can fill up the Performance Appraisal Form in the system and we also can print out the form. Not like the previous year, we have to fill up the form manually."* [Respondent 37]: *"Previous year, they were using EGNet line which it only can be accessed in the office environment. But now, the system [HRMIS] is the web-based platform; we can access from anywhere with the internet connection."* [Respondent 38]: *"Easy because we can access the system from home… at the office, we can access from anywhere. And then, we can fill up the form very easily, compare last time; it is quite pestering to fill up the form manually."* [Respondent 39]: *"we have improved or enhanced the coding in the system [HRMIS]."* [Respondent 42]: *"Easy and I think easy is good because we can access the system through an internet connection by using our smart phone or iPad."* [Respondent 45]: *"HRMIS has improved a lot, the response time is good."* [Respondent 46]: *"the system is still not interactive to the user, user-interface"* [Respondent 52]: *"Actually HRMIS2.0 is the improved system from the old HRMIS."* [Respondent 52]: *"Now, we have developed two mobiles application for Android and iOS platforms for the users, which are MyHRMIS Cuti [Leave Module] and MyHRMIS Profil [Personal Profile Module]."* [Respondent 55]: *"We developed HRMIS 2.0 to fulfil the needs of the users, which now, can be accessed in four browsers,* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | *namely Safari, Mozilla, Google Chrome and Internet Explorer. Now, the number of HRMIS user has increased."*<br>[Respondent 58]: *"HRMIS is good now. Now, everyone can use the system (HRMIS) even the drivers and general workers."*<br>[Respondent 63]: *"Most of the civil servants are very excited to use the mobile application … because these modules are easy to use."*<br>[Respondent 65]: *"HRMIS has changed a lot, fast response time. Previously, we had lots of problems in term of performance, but now, we have solved it."*<br>[Respondent 67]: *"When we took over the system from the vendor, we got positive feedback from the users… system response time much faster than the old system."* |
| **Training Resources** | Budget Allocation<br><br>Development Budget<br><br>Public training institutes | [Respondent 1]: *"There is no problem for HRMIS to get a budget from the government… some provision has been allocated for HRMIS training."*<br>[Respondent 4]: *"My [budget] allocation is mostly for management training."*<br>[Respondent 5]: *"We [Organisation A] have the allocation for HRMIS next year under development budget… the allocation covers system development, maintenance and training."*<br>[Respondent 8]: *"The government has provided an allocation for HRMIS, but the allocation also for the purchase and upgrading of servers and software licenses that we need to do after the vendor is terminated."*<br>[Respondent 13]: *"The government need to review the allocation given to the agency* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | *because the agency need more allocation to develop, implement and maintain the system. This is because all the process will be done internally."*<br>[Respondent 13]: *"All 346 agencies will update the information about courses and facilities in the portal and it's open to all."*<br>[Respondent 16]: "*We [organisation A] can always get an allocation because HRMIS is under development budget… this allocation includes for HRMIS training in technical and management."* [Respondent 31]: *"There are many courses and training provided by INTAN. Normally, IT officer will get the relevant courses from INTAN such as database management, networking, and programming languages."*<br>[Respondent 17]: *"I was given training on Java, framework and database related to Open Source, Postgres and Oracle from INTAN."*<br>[Respondent 18]: *"I have attended certified course… for system testing... Certified Tester Foundation Level (CTFL)."*<br>[Respondent 23]: *"The courses and training provided by INTAN is relevant with current technologies because we have a collaboration with Microsoft Incorporation."* |
| **Management Skill** | Procurement Management Course<br><br>Financial Management Course<br><br>Stress Management Course | [Respondent 15]: *"It is important for us to attend a procurement course because we can learn the government's procurement process and enhance our skills in procurement management… it also helps us to plan to purchase ICT equipment, hardware or software in the future."*<br>[Respondent 18]*: "It is important to us to improve our management skill… that's why other than* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | Time Management Course<br><br>Project Management Skill<br>Position of the officers | *technical training, we will go for management courses, like financial management, procurement and stress management."*<br>[Respondent 21]: *"The most important that I can see is Project Management especially for HRMIS because HRMIS is a large system… if we lack Project Management skill, then the failure rate would be higher."*<br>[Respondent 27]: *"The planning of ICT project development is very good, we can see the objectives and direction what the government plans to do, but in term of project implementation, it is quite bad. Maybe because of lacking of project management skills."*<br>[Respondent 31]: *"We also attend for management courses, mostly for the human resources, stress and time management… it helps us to improve our management skills especially for senior officers to manage the subordinates."*<br>[Respondent 49]: *"It depends on where you are. For instance, if you are in this organisation, even though you are in Grade 54 (Senior Officer), you are still managing your technical skill and knowledge, you still need to know your technical because you have someone to report to. But if you are in the agency where Grade 41 (entry level or Junior Officer) is an IT Manager, then you will do much on managerial and less on technical because you have to pass the technical job to the programmer."* [Respondent 50]: *"In the government organisation structure, the assumption is when you are in higher position; your technical skill will reduce, because it's difficult for you to change. If* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | *you want a higher grade, but at the same time you want to maintain or enhance your technical skill, then, you cannot be in a higher grade."* [Respondent 54]: *"Maybe we can identify some officers who have... For example, leadership or communication skill and these officers that we need to train them to be an administrator, at the same time they can do the technical job."* [Respondent 58]: *"When they get promoted to a higher position, then there is no problem for them to perform the given job if they are equipped with good management skill. But, if the person only concentrates on technical not on the management, when get promoted to be a Head of Unit or a higher position, it will affect their performance."* |
| **Organisation Planning** | Strategic Planning<br><br>Organisation Goals<br><br>Organisation Vision<br><br>Changes of the leader | [Respondent 6]: *"different leader has different directions or mission"* [Respondent 10]: *"our goals or vision is depends on the leader, if the leader is change, then the goals or visions also change."* [Respondent 18]: *"there is no continuity of the organisation's planning because of the changes of leader."* [Respondent 20]: *"every leader wants to leave their legacy in the organisation and we are as the subordinates have to follow their vision."* |
| **Lack of Recognition** | Monthly award<br><br>Reward<br><br>Recognition<br><br>Salary increment | [Respondent 62]: *"I felt that the SG [support group] section, which consists of 40 programmers didn't get anything [recognition]. We can see that during the monthly assembly, the best employee of the month award is normally* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | *received by officers from other section."*<br>[Respondent 61]: *"We need some reward or recognition from the management, but they [management] don't even appreciate what we have done so far… we felt so frustrated."*<br>[Respondent 55]: *"Staffs worked so hard, but not everyone gets the recognition... for those who were given the recognition should respect others employees especially those who has been helping them. It doesn't mean that we have to treated, but give something that we can appreciate them."*<br>[Respondent 54]: *"One thing to make the [IT officer scheme] scheme officer to be more passionate to enhance their knowledge and skill is by rewarding them with a position or increase the salary. At the moment, there is a lack recognition given to them."*<br>[Respondent 59]: *"We should not assign more work or increase their workload if there is no reward for them [IT officers]… no salary increment or promotion."*<br>[Respondent 54]: *"The main thing for IT officers to be recognised is they need to have a passion and self-discipline… sometimes, we cannot blame the government for not recognising IT as an important role in the government administration. Partly because of their [IT officer] fault..*<br>[Respondent 56]: *"Sometimes I can see the attitudes of some programmers are not what we expected; they are not serious about their work. Perhaps they are in the comfort zone."*<br>[Respondent 49]: *"The government has set up a trust* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | *fund, which the trust fund will be used as a token to the in-house system or application development… some incentive from the government to the officers involved in the development of in-house system."* |
| **Lack of Awareness** | Targeted group<br><br>e-Government Flagship<br><br>Government project | [Respondent 11]: *"the e-Government flagship, there were about 28 government projects."*<br>[Respondent 13]: *"there were lots of government system that we (government servant) did not know"*<br>[Respondent 14]: *"focusing on the targeted user group or a group of Malaysians"*.<br>[Respondent 41]: *"so far, I never used another system than HRMIS"*<br>[Respondent 46]: *"so far, only HRMIS"*.<br>[Respondent 53]:*"if Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) did something, only the parties involved with the project will know what MAMPU was doing".* |
| **System Security** | System Security<br><br>Lack of trust | [Respondent 16]: *"most civil servants are not trust the system because of security of the system."*<br>[Respondent 42]: *"I am not so sure about the system security because sometimes other user can access our personal information."*<br>[Respondent 45]: *"to be frank, I do not trust the security of the system"* |
| **Negative User Perception** | Vendor Expertise<br><br>Lack of Internal Expert | [Respondent 44]: *"I think the system is developed by [the vendor] because the response time is good now."*<br>[Respondent 47]: *"The government IT officer cannot develop a better system because they rely on the vendor's expertise."* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | [Respondent 48]: *"IT officers in the government just like a technician; they cannot develop a full functioning system by themselves. They still depend on [the vendor] to develop a system."*<br>[Respondent 51]: *"The perception for some users, HRMIS is not helpful… they (users) perceived HRMIS is not important, but we want HRMIS to be like a one-stop centre system for everything."*<br>[Respondent 52]: *"Some of the users did not care about the system. Even at one point, they don't want to update their data in [HRMIS]… They just don't bother."*<br>[Respondent 59]: *"The users should be more responsible, they do not know because they can't see the function and benefit of HRMIS to them. For them, HRMIS is not important… because they think, what they are doing now is for their bosses [line managers] and government."*<br>[Respondent 62]: *"They [government servants] still don't believe our staff can do better [than the vendor], that is what happening in the government."*<br>[Respondent 65]: *"Some of them [senior officer] are refusing to use [HRMIS], and their staff have to do it [update information] for them… They still have negative thinking about [HRMIS]."*<br>[Respondent 69]: *"Some users still cannot believe that HRMIS is developed and maintained internally, by civil servants in this organisation."* |
| **Pool of Programmers** | Pooling talent<br><br>Better resource management | [Respondent 54]: *"I would prefer a system of pooling talent. Now, there is a pool of programmers. That's good because you can* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | Balanced workload<br><br>Multitasking job | *manage your resource much better."*<br>[Respondent 56]: *"I can see the pool system is good because the workloads amongst the programmers are balanced."*<br>[Respondent 69]: *"I like the concept of a pool of programmers because our work is balance among us (programmer). The system analyst can give a task to any programmer available."*<br>[Respondent 66]: *"It much easier if we pool all the programmers. So, if we want to develop a system, we can use any available programmer."*<br>[Respondent 62]: *"Pool of programmers is good because the programmer can learn many modules in the system, not focus to a specific module."*<br>[Respondent 68]: *"I can know the workflow process in many modules because different module has different workflow."*<br>[Respondent 55]: *"The government should implement a job rotation among IT officers because they can other task as well, not only focus to a certain job or task."*<br>[Respondent 62]: *"Maybe the organisation can do a job rotation among programmers and assistant technical officer so that the assistant technical officer can also do the programming and the programmers can do technical job so that they can be learn many skills."*<br>[Respondent 57]: *"Job rotation is also a good approach to be implemented so that the programmers or technical officers are not in the comfort zone. They can be exposed to various work tasks and they can do multi-tasking job."* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| **Data Centralisation** | One-stop Information Centre<br><br>Human Resource Information<br><br>Human Resource Planning<br><br>Human Resource Service<br><br>Service History | [Respondent 1]: *"In the past, we had to collect data from each agency, and it takes time."*<br>[Respondent 2]: *"We have everything in HRMIS, just like our Service Book. We can have the history of our services from the date of appointment until now because sometimes we forgot about our employment history. For example, for those who have served more than ten or twenty years, they can retrieve back all the information".* [Respondent 3]: *"Civil servant can find any information about a human resource service from the system."*<br>[Respondent 5]: *"civil servant can access their service from the system."*<br>[Respondent 7]: *"The system can generate a lot of [reports] to the government for human resource planning and career."*<br>[Respondent 12]: *"With the system, the government can know how many officers are in the public sector. It is easy to monitor and make a plan"*. [Respondent 43]: *"[HRMIS is a] one-stop centre for information services of public servants, starting from the date of appointment until the date of retiremen."*<br>[Respondent 51]: *"When [HRMIS] is available, it can capture the data to cater for all the information of government servants. We can get all the information from the date of appointment until the date of retirement."*<br>[Respondent 59]: *"HRMIS serves to all civil servants and it is becoming more relevant because we manage the system properly and we can deliver what are requirements of the* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | *stakeholders... And then, the direction and scope of our work in this division [Information Management Division] is to fulfil the needs of the civil servants."* |
| **Management Style** | Project-based approach<br><br>Work as a team<br><br>Work in silo | [Respondent 51]: *"it will be based on project, no more based on unit or section. His (new director) concept, if there is a project; gather all the officers from every unit or section… form as a team".*<br>[Respondent 54]*: "it (project-based approach) creates accountability for every one because you have a specific role"*.<br>[Respondent 58]: *"in term of system development, of course it must have a team, not in silo*". |
| **Government Support for Network Infrastructure** | Putra Wi-Fi<br><br>Internet Access<br><br>Internet Bandwidth<br><br>Network Capacity<br><br>Fibre optic technology<br><br>Budget allocation | [Respondent 8]*:"MAMPU has upgraded the network capacity of OneGov.Net and the lowest bandwidth is about 2MB but they [government agencies] can request from MAMPU if they want to upgrade the bandwidth."*<br>[Respondent 20]: *"Now, we have provided the Wi-Fi (Wireless Fidelity, wireless internet) facilities in this organisation to the public."*<br>[Respondent 22]: *"In the network technology, we used FCOE, Fiber Channel Over Ethernet, and a combination of internet and fiber technology."*<br>[Respondent 24]: *"Now, we have upgraded the network from ATM [asynchronous transfer mode] to MetroE because the technology of ATM was outdated."*<br>[Respondent 27]: *"Now, the government has introduced Putra Wi-Fi, free internet access in the government office, not only for government servants but also for the public. We have also upgraded the bandwidth up to 1GB but we can increase the bandwidth if there is a request from any* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | | *government agency because currently, the network still under-utilisation."*<br>[Respondent 30]: *"the government has spent lots of money to improve our network"*<br>[Respondent 35]: *"last year [2014], there was a big allocation [budget] to upgrade our government network especially for fibre network and wi-fi."* |
| **Commitment** | Good commitment<br><br>Bad commitment | [Respondent 16]: *"Commitments from most government agencies are good to use the system [HRMIS]."*<br>[Respondent 19]: *"there are some agencies, especially from state agencies, not really keen to use the system."*<br>[Respondent 24]: *"it's depends leader of the organisation, if he or she is keen to use the system, then he or she will give a full commitment to implement the system in their organisation."*<br>[Respondent 28]: *"I can see that our Secretary General really concern about the implementation of HRMIS throughout all government agencies."* |
| **Government Regulatory Policies** | Federal Government<br><br>State Government<br><br>Statutory Bodies Local Government<br><br>Government Agencies<br><br>Different procedure and policies<br><br>Different Standard Operating Procedure | [Respondent 3]: *"Actually, we want to capture the system according to standard procedure, but because of the different service scheme, maybe they have a different process. So, we have to go to every agency. That's why the process will take longer and tedious because every agency has their own procedure."*<br>[Respondent 5]: *"For the state, Statutory Bodies and others are different processes because they have their own acts."*<br>[Respondent 13]: *"Every agency has its own core business. They [government agencies] tend to concentrate on their core business."* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| | Procurement process | [Respondent 20]: *"We have about 720 government agencies that consist of five types of government services; Federal Civil Service, State Civil Service, Federal Statutory Bodies, State Statutory Bodies and Local Authorities. The problem is, the [Public Service Department of Malaysia] can handle for the Federal agencies, but others, they have their own procedure."*<br>[Respondent 50]: *"In the process for system development, the Application Section has their own SOP [Standard Operating Procedure] to comply with. If you want to develop a new system or application, you have to forward a proposal to the meeting through the Application Section, which has a committee called the System Development Committee. After you have submitted the proposal, they [the Application Section] will prepare a document to be presented to the [System Development] committee. Then, all the committee members will discuss and gave their comments. If your proposal is approved, then you can proceed with the system development with a number of man-days [duration]."*<br>[Respondent 51]: *"As we are aware of the procurement process in government, if we did it fast, then people will say there is corruption. If we follow the procedure, it will take at least six months to get the equipment or services we want."*<br>[Respondent 58]: *"Government have some policies that we need to follow and we have to understand them. If you did not comply with the policies, then you have to answer to the auditor."* |

| CATEGORIES | CODES | INTERVIEW QUOTATIONS |
|---|---|---|
| **Cost** | One-off Investment<br><br>Calculation of man-days<br><br>Maintenance contract<br><br>Maintenance cost<br><br>Operating cost<br><br>Update the system<br><br>Software Licensing<br><br>Charging cost | [Respondent 4]: *"We use old technology for HRMIS, and if we want to change (to new technology), maybe it involves a lot of money."*<br>[Respondent 8]: *"I think the government will have to spend more money after termination of the vendor because now, we have to purchase the ICT equipment, servers and software licensing by ourselves."* [Respondent 33]: *"We can save more money… our System Analyst has made some estimation based on a calculation of man-days per year; we can save about RM1.2 million"*<br>[Respondent 49]: *"It [a system developed by the vendor] is just too expensive to get somebody to [develop the system] for you because it's not a one-off investment… it's a long-term investment."*<br>[Respondent 58]: *"If the number of participants is less than ten, it is better if we send them to the external trainer. We will do an in-house training if the participant is more than ten people."*<br>[Respondent 59]: *"When the maintenance contract has expired, they [the vendor] charged the government with the higher price for every change. For example, if we have changes in our regulations, we have to update the system. So, we have to call [the vendor] and they will charge higher costs."* |

# APPENDIX 6 – SAMPLE INTERVIEW

## Sample Interview Extracts (transcripts)

### Transcript of Interview with Senior System Analyst, Organisation A

**Interviewer: First of all, thank you Mr. XY (not real name) for being my respondent. Can you please tell me your duties and responsibilities?**

Respondent: Ok. My duty in this division (Information Management Division) is a Module Owner (MO) for Career Management module. Career Management is a part of HRMIS. But for your information, I am the only MO for this module for the last two months. My previous 7 years' experience was as a developer and system analyst for Open Source project in this division as well. I started my job here until now.

**Interviewer: What do think about the skill and knowledge of IT officers in this organisation?**
Respondent: If we want to say about the skill, actually, we have two groups of people. One group is the developer or programmers and another group is the module owner or System Analyst. When we are talking about programmers, the skill and knowledge of programmers very varies a lots. The range of their skills and knowledge are from proficient to very not proficient because the range is quite big. Only in this organisation, BPM, quantifier for skills is not properly done. For example, Encik A, we do not know the proficiency in certain programming language, we don't properly quantify because quantifier is self-done by the programmer himself, which it is not right in my opinion. So, it happens for the last two years, I see that a lot of programmers putting their ASP skills, ASP.Net skill in a very proficient but in reality, they are not that proficient.

**Interviewer: How we can quantify their skill and knowledge in programming?**
Respondent: Ok. In my opinion, I mean we have a lot of outside companies that are really into software development and all those things. So, we can collaborate with them, come out with a set of questions, a question bank, that can be given to all these people (programmers) and may be in one hour or two hours, they have to answer and from that answer, we can actually evaluate how, how high or how low are their skills in a certain programming language.

**Interviewer: What is your opinion about the current technology being used in the system?**
Interviewer: Owh. So, there is, BPM just do some, some test or some what we call that, some exam or some test for them to, to test their skills, the level of skill of IT officers or programmer itself?
Respondent: As far as I know, there is no any test done for the programmer. Only themselves

Interviewer: Haaa... They, they evaluate their self as a proficient
Respondent: Yes, self-evaluate.

**Interviewer: So, how we can quantify that they are very good in programming?**
Respondent: Ok. In my opinion, I mean we have a lot of outside companies that are really into software development and all those things. So, we can collaborate with them, come out with a set of questions, a question bank, that can be given to all these people (programmers) and may be in one hour or two hours, they have to answer and from that answer, we can actually evaluate how, how high or how low are their skills in a certain programming language. And also can be applied for database, we can, we can collaborate with Oracle for example. For programming may be with Microsoft companies or those things.

**Interviewer: I see because from previous respondents said, our skills, our IT, our programming skill is quite good, actually they are expert in their field, they said. But I'm not sure how good they are because I'm not good, actually I'm not a programmer. So, I don't know how good they are. But I need to know, because after the termination of vendor contract, vendor last 2 years, last 3 years**
Respondent: Last 3 years. What I can say, last 2 years ago, during the haywire time, I was put in charge of managing on the programmers. So, during one of the section meeting with the programmers, when they self-evaluate them self-putting their skill on high, high level portion, I challenged them by saying, I think I quote myself, "If you say that you are very proficient in ASP, I challenge anyone of you to create an ASP system from scratch" and nobody can do that except a few people. I think less than 5 people can actually do in my opinion. The rest, we can test them. Ok, you create a very simple system, just an online form and display on another form. I don't think

**Interviewer: They cannot do it?**
Respondent: 50% they cannot do it at that time, yes. So, I'm not sure about now, I mean last year and this year. They might have upgraded their skill after doing a lot of developing work.

**Interviewer: So, what is your opinion to upgrade their skill?**
**Respondent:** As I said, we need some sort of measure, measuring system which is like an exam, for example you sit for Microsoft Certified Program. Something like that where the, the quantifying system or method is recognised by outside companies, Microsoft, Oracle, all those companies. For example, if our programmer quit from the government, certified as an ASP expert by, for example, for the Malaysian Government, if they are good, Microsoft said OK, you can, I know you can do this because we have endorsed your exam questions. So, I think that is what we should aim for. We should not stay inside government agencies only, we should collaborate with outside.

**Interviewer: So, how about the training for them? Actually, is it continuously training for them to upgrade their skill?**
Respondent: Yes. BPM has, has range lot of training for them but as I said, there is no measurement how effective the, the training to them. I think the main problem is that, they are not developing or creating new codes. They just modifying existing codes, and debugging whatever errors inside the codes, inside the codes. It is different from creating a whole new system by them self or, or a sub, a portion of the system by them self. We have to write everything from

scratch. What they did, as I understand, they take a template or the existing system and they just change whatever need to be done. They just copy, paste and change.

**Interviewer: So, is it the training is from outside or inside?**
**Respondent:** Training is mostly, I think every training for Microsoft.Net, ASP.Net is done by outside company.

**Interviewer: By outside company. Is not from the INTAN?**
Respondent: INTAN? INTAN has those training but it is, by the programmers them self. They have to apply for the courses there. They are not sent by BPM over there.

**Interviewer: Ok. So, actually, their skill in ASP or ASP.Net is appropriate for what they have done for the current system?**
Respondent: Yes. The proficiency is enough for them to maintain the existing codes in HRMIS

**Interviewer: Ok. How about the Open Source for the previous job?**
Respondent: OK. For Open Source is totally different situation where there is no existing codes for programmers to and modify. Everything has to be done by them self. So, I can say that those programmers who involve with Open Source projects are level I can say, from proficient to very proficient. Some of them, maybe one or two person I can put a Master level; maybe five or six people at proficient level where they can create a simple system or a medium system complexity by themselves.

**Interviewer: So, they are two separate of programmers? One is for Open Source; one is for ASP or ASP.Net?**
Respondent: Previously, that is how we run things but it happened that we are having a shortage of manpower. So, programmers have to learn both programming language. They are not expected to only master one, one language (programming language). They have to know Open Source and, and ASP.

**Interviewer: So, Open Source, what kind of programming language does you to learn?**
Respondent: Ok. 90% of our systems of Open Source system are run on PhP and Java, I think there is one, and the rest I think are PhP.

**Interviewer: Now, the HRMIS 2.0 is moving to the JavaScript right?**
Respondent: Yes

**Interviewer: OK. I heard that HRMIS2.0 is going to access by multiple platforms and browsers. So, all the programmers have to learn about JavaScript and PhP?**
Respondent: Yes.

**Interviewer: So, all the programmers are put in one section?**
Respondent: Yes

**Interviewer: Is it including for Open Source and HRMIS?**

Respondent: Correct

**Interviewer: Can they do some rotation job for them? Do they have to do a specific task; I mean there is a group of people only for Open Source, and another group of people only for HRMIS?**
Respondent: Some people (programmer) have cross the borders, some of them from Open Source to Microsoft and, and vice versa. But not all, maybe only 30 or 40% of them can actually do both.

**Interviewer: How about the level of their skill? Are they good in both programming language?**
Respondent: Those who are cross the borders are quite proficient because the transition of learning any language in a short time, you must have a very good basic programming language.

**Interviewer: So, what is your opinion about multi-tasking among the programmer?**
Respondent: Ok. In my opinion, not from the government perspective, but from outside perspective, if I was put as a programmer, the first thing that I should be proficient in is programming. For example, if you put yourself, if you are hired as an accountant, but you don't know how to do an account. So, I think if you don't, do not know how to do other things, people, is ok because you are an accountant but you don't know how to do an account but you can do managing people very well, I mean, I think you have, you have not proficient enough in your field.

**Interviewer: So, do you agree with the focus on the job?**
Respondent: Yes. I think that is why, why government sectors, sector, I mean the human skills is not reaching the expected level because you do many things, you are not doing anything but you can do everything. But in private (sector), if I am not mistaken, if you are put as a database, DB Administration and then you concentrate only on DB. But then, you can see that after 3 or 4 years or 5 years, these people, I mean can have really high level of knowledge and, and their salary can really, I mean can reach nearly RM10,000 if you are good Oracle for example, you can do anything on Oracle, you can debug Oracle problem, you think, I think the company can easily pay you RM10,000 per month for your skill. But is not happening in government because, because you have to do everything and you cannot focus on one thing.

**Interviewer: Because in the government structure, the scope in the government is different what in private because they have to put the element of human resource, and then finance and the procurement as well because in the higher post, you have to manage some, of course you have to manage your, your subordinates, and then you have to know how to purchase something, and then, and then you have to manage the finance. But sometimes there is pro and cons**
Respondent: Ok. I understand the need for, for this professional to go into administrative side; we do need those people also. But not all may be just 10% of the 100%. So the rest of the people have to focus on the specific skills, maybe we can identify some people who have, for example leadership skill, communication skill and these people are the people that we train them to be an administrator, at

the same time they are doing their technical skill. We don't generalise everyone. Not everyone can be a manager. But that's the problem right now.

**Interviewer: So, we can create the expertise in the government sector**
Respondent: I think we need a new department for the IT itself. We need an IT department by our self because only an IT person can actually manage, know what is going on. How do we can actually improve the scheme itself? Because now what I can see, most of the civil servants see that the IT department as just a support department. IT is not the main core for the, but now, because, that is my opinion, I think because they just ok, IT officer is a support, is not the main core in the, in the organisation. But in real life, the IT is the main core

**Interviewer: To create more expertise in IT**
Respondent: Yes. And I think we cannot, we cannot blame the government for, for not recognising IT as an important role in their administrative task. Actually, it is partly, the fault of IT people themselves. Ok, during my 7 years in government service as an IT Officer and I interact with a lot of F (IT Scheme), IT people, I don't see the passion for self-developing from themselves. For example, if you are not sent for training, you do not make an effort to learn the skill by yourself. For example, you are put in charge of, of managing a database, Oracle Database. But, their, you do not want to learn by yourself. All you can say is why you did not send me for training? I need training, I need training but there are a lot of materials on the internet and, and your colleague for example, who are very proficient in those thing, you can learn from people, you can learn from the internet. And, it relates back to the proficient programmer that I have said before. I can see all of them have this attitude. Where they do not sit and, and wait for work. If they don't have work, they just research to the internet, learning new skill because IT skill is very fast evolving. If you do not upgrade your skill this year, next year you will already left behind. Take for example in PhP. Ok, in PhP; if you don't, you do not know how to do the framework by, by this time, you are not relevant with the current technology itself. And right now, in PhP or Open Source, I think even .Net, everything is moving for framework. But you have a set of convention where the other people can understand what you are doing. So, if you do still not know how to do framework, FVC, I think you are not relevant, if you go to Microsoft for example, they said that your skill is outdated already. It’s obsolete.

**Interviewer: Obsolete with the current technology**
Respondent: Yes. So, the main thing for IT people to be recognised is you need to have passion and self-discipline and, need to, have to deliver the best in your work. Not just, doing the work but you need motivate but they don't that motivation. Maybe the environment of the organisation makes them to be like that as well as their colleague, and then, may be the top management also play the main important roles

**Interviewer: So, what is your opinion about the role of top management?**
Respondent: Ok. I'm really quite disappointed with the higher management if you are talking 48 to above. I can understand that they have to move, switch from technical side to management side. But, from what I can, I can see most of them have lost all their skill (technical) in, in language (programming). Take for example, we are doing HRMIS which is we are doing JavaScript to change from VBScript. Most senior officers cannot be even differentiating between Java and

JavaScript. It happened during the meeting and I said, OK, we are doing Java in our programming. So, we are not doing Java, we are doing JavaScript and they even don't know how to differentiate between Java and JavaScript. That is one big mistake. If you do not know that, I don't have to ask any further question about programming.

**Interviewer: So, they lost their skill, their knowledge, everything**
Respondent: Yes. I don't know, this is my opinion. If, you give a question to the senior officers, Can you do a Select Statement, SQL Select Statement where certain things, we have to filters? I'm not sure most of them can do that.

**Interviewer: So, that's why they cannot advise you on the system itself but they can talk about from the management perspective**
Respondent: Yes. And that is one thing, I think that is the main problem but the most damaging part is where they go into, they have to meet other people. For example, yes, they have to become the expert in IT, advising these people on how to actually to implement IT. If you do not have knowledge, how do you going to advise people? You are going to give bad advice, or even to show how, how ignorance you are in your field. So, they have to advice the top management, the stakeholders as well. So, may be because they are not very proficient in the programming language, so, they don't, don't know how long it will take to complete the system because the system itself is quite complex. So, they can, Ok, may be top management said, stakeholder said, OK, you have to complete within 2 months, is, sometimes the programmers or who do the programming, it takes longer than that.

**Interviewer: So, that's why**
Respondent: The planning is not actually properly done because some technical skill is, but some of them have to go to for the technical, 100% for technical, may be some of them can go for the management.

**Interviewer: So, we have to identify which one is suitable for the management and which one is more suitable for technical.**
Respondent: Yes. I understand. Ok, that's one thing. But, I'm not expecting them to be an expert in for example, in database, or network, or programming but at least you must retain the concept of those skills. You have to know the basic of those skills. I don't think you will lost the concept if 10 years from now, people ask me, "What is the different between OOP and, and Procedural?" I think 20 years from now; I can answer that because that is the concept. If you go, "How do you want to print certain statement in ASP." I might forget that, so, I'm expecting the top management at least maintain the concept, the knowledge of concept of the skill, of the IT skill. That is what I'm expecting. But, I think, you cannot, I cannot blame them 100% because what I'm understand, in the early 80's or '90s, all the programming work, all the maintaining work done by the vendors. At least, people only put in charge of monitoring the vendors, may be. So, they are not polishing their skill. After they have graduated, so, that continues until now. So, they just more are focusing on project management skill.

**Interviewer: Monitoring skill is not really on technical**
Respondent: Yes. But I can see, but in MAMPU, I can see the different. What they called, Pakar MAMPU, those people, the 52, the 54, I know they can do. They can

do analysis, they can do design, they can do database because I went for a few training and I met them, and they gave their talk, and I talked and communicate with them, I see that they know. I think they know much more than I do. So, I think some changes have been done.

**Interviewer: So, what do you think? Is it because of the training road map is not properly done? or what? Is it the structure of the training for them is not good?**
Respondent: Ok. Training, I think we have a lot of training. From the day joined in the government until right now, there are lots of certification and training I have gone through. So, I don't see the problem with training, I see the problem with, what we called that, testing or quantifying the level of skill of the people. If, you know that certain people has not meet the average skill level, these people the one that must be put for extra training for certain thing should be done for them. But that is not what is happening, what is happening in government right now is, they said "Ok, we have sent 30 people for Advanced ASP.Net and they said that ok, these 30 people are, are the advanced people after sending for training but no quantifying on the skill, retain of the training has been done for them. So, there are should be separation between programmer and System Analyst in our level, 41 and above because I see that 41 and above is more on analysis, design and then see the requirement of the user, but they are not touching for programming.

**Interviewer: So, do you think is it for them? Because they are not touching for programming, and they are not good in programming, so, they know how to program the system, everything?**
Respondent: OK. In my opinion, System Analyst in Grade 41, when do you go for 41, the entry level, you should at least do some programming work or network, network setting up or data, server setting up by them. In the work place, I mean not relying on your staff to do it for you. But now, the job scope for 41, entry level is just for analysing and designing work.

**Interviewer: So, they are not becoming an expert for the programming?**
Respondent: Ok. For you to become a good analyst or a good designer, you need to know what is going at the back of the system. Take it for example an architect, you don't know what is the proper dimension for a window for example, how can you design a good building? If you don't know how to put two bricks together using, using mortar (more tiles) or anything, how can you suggest what kind of brick I should use or what kind building material I should use. So, they need to actually learn on and, get some of the skill for you to, to do a proper and better analysis work. And of course designing work.

**Interviewer: May be what I can say, for the entry level you have to learn about more programming, and then, if you are get a promotion for 44, and then get some involvement in system design and analysis and then you know how to design everything right?**
Respondent: Yes. 41 is should be a high breed. We put as an Analyst Programmer; I think in private they have that position. They do some programming and do also be an analyst. If you are 44, then you become fully Analyst.

**Interviewer: Is not happening in the government sector?**
Respondent: It is not happening and I don't see it will be happen anytime soon.

**Interviewer: So, that's why I think the programmers, I mean for the F29, F32, they are become stagnant because they cannot upgrade themselves to the higher level. I mean they cannot learn about the system analysis and system design. They just do the programming and it is quite a waste for them actually**
Respondent: Yes. If you can see that a lot of or some of the 41 officer right now are the ones who was 29 or 32 before who have a degree and upgraded for 41 and those people are good. Even here, I see, I think 2 or 3 people are good analyst because they have done programming during their 29 and 32 before.

**Interviewer: May be the government should think about that because most of the 29, 32 now they have a degree and the government can upgrade them instead of we hire the new officer, why not we can upgrade**
Respondent: Yes. Upgrade all the people

**Interviewer: Because the technical, I mean the technical should become from the inside, not from the outside.**
Respondent: Yes. I think most in private sector are doing that. TNB, Telekom, they are hiring inside, they are not hiring, may be a few from outside but most of them they hire from inside. And one more thing, a way to make the F scheme (IT scheme) officer to become passionate in gaining knowledge and skill is by rewarding them with something, with position or, with increasing the salary. But right now, they are not getting anything for becoming an expert in their work.

**Interviewer: There is no recognition for them?**
Respondent: Yes. Even for example, we can pay vendor easily, RM10,000 for doing a simple system but we cannot even give RM1,000 for our staff creating system much better than the vendor. They have developed HRMIS Mobile, but they get nothing.

**Interviewer: So, there is a new version from the inside but there is no recognition for them. So, they just win for KIK (Kumpulan Innovatif dan Kreatif), for how much?**
Respondent: I think RM1,000, RM2,000 shared by the 5 people.

**Interviewer: Really? I mean, you got the reward but it is not enough.**
Respondent: Yes

**Interviewer: So, if the government think about to give more reward, maybe it can create innovation from them and be more creative.**
Respondent: Yes

**Interviewer: So, what do you think about the organisation structure right now?**
Respondent: Ok. IT Organisation, in my opinion, it should change. I would prefer a system of pooling talent. Programmers right now are pool. That's good because you can manage your resource more much better. Ok. But 41 and above, they are not pool for the talent. So, we have people assigned to very demanding work and we have people assigned to not very demanding work. So, the burden of work is

not properly done. Ok, that is one thing about balancing the burden. Second thing is, if we have a pool of analyst, if a system comes in from the outside, we can assign, appoint a senior officer as a project manager, where he or she has to properly plan and identify what resources are needed. And the pools of analyst, for the grade of 41 or 44 are assigned to a specific role for that project. For example, a project manager identified, I need one database designer, I need 2 analysts, one document manager, and 3 testers for my project, chartered for 8 months. Ok. So, after, may be they have to go through a panel, whether the panel decide, Ok, we approved your resource requirement, ok and the people are given to the project. The good thing about this is the project manager, the senior officer has to plan and manage their resource properly. That wants them to learn and polish their skill. The second thing is that the analyst can go into a project where they actually have; they know the scope the work. If I was put into a project as a database designer, I don't have to think about the getting requirement, or doing the analysis where, or how good is the coding will be, so, I know my job properly and I don't need to, to, as a project manager don't need to hold these people for the whole 8 months. May be I need the analyst people and database designer for the first 3 months. After I got my requirements and analysis properly done, I can release them back. I only need, ok, so, the programmer comes in. When the program, we only get the resource of the programmers after analysis is done

**Interviewer: 3 months after the analysis is done**
Respondent: Yes. We don't get them at the early time, so, that is a good way of, of managing your resource properly. And, and it is, I think a much proper way of doing thing. But. Ok, that is how I imagine IT department should be but as is when a project comes in into BPM, the senior officers or the KPPs, Ok, Shahril, you are put in charge of sub-module XYZ, you have to do the analysis, you have to do design, you have to do the database. Check by yourself and you have to create document or maintain document, and you have to manage your project timeline by yourself. So, I think this is demoralising for the analyst. And for the programmer, when they meet with their analyst and they will say that, "You are not doing your work properly, your analysis is not properly done, this is half cook. Where is the, the SQL, where is the database design, the database design is not right" Because may be, may be the analyst doesn't have enough time to actually focus on what they have

**Interviewer: So, that's why you are proposed doing the system by project based?**
Respondent: Yes... Project based. So, the project is properly managed. I think that is a good idea because the new Pengarah is going to move to the project based system from the current practice and you will create accountability for each one because you have a specific role. If you do not do your work well, people know that is you that are not doing your work well. If you do everything, so,

**Interviewer: So, you cannot blame him or her**
Respondent : Yes... it became a lot of excuses because you put on the base, you are in charge for the project, and you are in charge for the project or task

**Interviewer: That is a good thing. Ok, so, what do you about the IT infrastructure here?**
Respondent: I think government infrastructure is very good. The government have very high end equipment and, and manage well. May be by the vendors or some

**Interviewer: But some people, some respondents said, even the IT infrastructure is good but the technology is quite, may be, 2 or 3 version behind from the current technology. Is it true?**
Respondent: If you want to race for the technology, I think it will be never ending race. But I'm talking about having the proper technology for what we need right now. So, I think as what we have right now, I think it is sufficient for doing our work. If you want to race to the latest technology everything, it will, you will only waste money for, for the resource that you actually you don't need. So, I think it is ok.

**Interviewer: Ok. How about the resources? Resources in BPM right now in terms of staff, time, budget, what do you think about that?**
Respondent: Ok. About staff. I think we have a lot of staff but as I said, we are not managing these resources very well. We are putting people a lot of people into the role that that's does not have much work where and we put people into role that they don't even have enough time to do that. So, we need to change that. I think, sorry, the number of staff is more than enough but it is well manage. And then about time. Ok, when we go to time, we have to talk about planning. Ok, planning. I think the planning is not very properly done because, from my experience, when we try to, to, let's say put a time frame for a certain task, for example, myself, I do not know how to actually calculate the number of days to complete the system, 30 days? 60 days? And how can I come out with 30 days or 60 days? I cannot explain and justify. I think there is a way how much time you need for a certain job. But we don't learn that. I don't learn that.

**Interviewer: So, you need some, may be some training, some experience to do that actually**
Respondent: Yes.

**Interviewer: But you are not exposed on how to manage, how to manage a project very well, I think.**
Respondent: Yes. If, if not at my level may be the higher level has learnt that of planning for example. A certain programming work has to be done in 3 days for 2 people. But if you don't know, about something, ask from appropriate people. But what I can see now, for example, Pengarah level or Timbalan Pengarah, they don't listen, they don't ask programmer, "Ehh, how much time do you need to complete the coding for this work." They don't ask the programmers, they ask the KPPs and KPPs just give the, "Ok, 3 months" Out of door, OK, 3 months, 5 months, 6 months. OK. But programmers have to cope with that, if they give more time than what they need is good. But if they give less time, then it will be a problem.

**Interviewer: Short time, it difficult for them to comply to, to complete the system, to complete the task that have given to them right.**
Respondent: Yes. That is one thing and another thing is in, in government, you cannot say everything in the meeting. For example, if you are not agree with

something and if you want to stay out of trouble, just keep quiet. I learnt the hard way during my first 2 years in the government, I was very vocal. I'm not agreeing with that, I think that is not appropriate, I think we should done this way and people don't like it. So, I stopped giving opinion and just listening very well. Until now, that is the safe way but, but I think it is not helping, it is a waste where, where the decision maker doesn't get all the proper input for them to make decision. Actually IT is considered quite ok for voicing the opinion. If, you go, I'm sorry, if you go into, for example, PTD, BK, PTDs everything, I don't think they are really can, "Boss, I think you are wrong. I think we should do this way"

**Interviewer: Immediately tomorrow you will go to another department or ministry**
Respondent: Yes. This is not your table anymore; I don't want to see you more tomorrow.

**Interviewer: That is the problem with the government actually. Is not happen what I have seen outside?**
Respondent: I think the hierarchy is not very rigid over there.

**Interviewer: Yes. Is not, is not something happen in Malaysia because we have a lot of hierarchy, a lot of layers**
Respondent: Yes

**Interviewer: Ok. What do you see any challenges a lied ahead in IT?**
Respondent: Ok. IT in government actually having a problem with putting our self as an important role in government activities. Most others, others scheme for example, look at an IT as an accessory

**Interviewer: It just a support**
Respondent: Support, yes. You don't, if you are not dead, then it is ok. We still can work but if you are not dead, you can do the entire extra thing to make it more super system you know

**Interviewer: But they don't know the system that they are using now is developed by internal IT Officer**
Respondent: Yes. So, in the future what we need is to change and change the mind to show them that we are doing more than what they, they expected from us. So, that is the challenge what we need to face in the future. To make them realise, to make the people realise, as you said, the PC you are using right now, if we don't maintain, if crashed for example, then it cannot do your work. This is IT people who are making sure that you can do your work. For your emails is another example because if you cannot send the email, there is problem for you. Because now, email is very important for everyone. Otherwise, you cannot communicate very well. So, the top management who deals with other top management should somehow, subtle the way of sending that message to other party. Look, we are important, if we don't want to do a work or strike for one day, your email, your PC, your network everything is gone. So, I think the whole government will collapse

**Interviewer: So, do recognise IT person in the government.**

Respondent: If can, I mean, if I can say, if you can quote from me, if that if the IT department in government want to change itself, they have to model the IT department, not from other government agencies, but from the private sector. That is I think the right way of changing, look at the private sector, how they segregate the people, the work, how they manage the, the task everything. So, look outside, don't look at other, look at AG how they do thing, look at Kementerian Kesihatan do thing, don't. Go outside. Go other countries, look at people. And do a benchmark which IT department is the best to be implemented in the government sector. So, everything should be revamped to enhance the, first the IT skill, the technical skill, everything for the IT Officer

**Interviewer: So, What is the process, the method that you are using for development and implementation of the IT, system in the organisation?**
Respondent: I can see that we are still on the Waterfall model. There are some, some people were trying to do, what we called that a spiral. They are moving from, from Waterfall to Spiral model but, but mostly, I think we still on the Waterfall model itself. Finished task A, ok, task A done. Then, move to Task B, don't go back to Task A anymore. Because Task A already recorded done, don't think about that ok. So, we are still mostly on that Waterfall way of thinking. But I think, during my, this HRMIS, HRMIS 2.0, I think there is an initiative for doing Spiral. Do some test, then do back in case of

**Interviewer: So, iterative process?**
Respondent: Iterative, exactly. I think the transition is on the way. But we are not still on about Scrum and those things; we are still far, far, away.

**Interviewer: Are you going to use an Agile method?**
Respondent: Agile method or everything because we are using an Agile method but no, they still, if they say Agile, they still on iterative. I don't see anyone is doing Agile.

**Interviewer: That's. So, last question. Any further comment from you**
Respondent: Ok. As I put myself a professional, I don't know whether I am professional or not, Ok. As a professional, you need to be a very proficient and knowledgeable about your field of professionalism and second, you need to have a passion about your work. You cannot become a professional just by, by, by giving out the average output or, or bad result, just by saying that "OK, I completed my task" You need to do your best in completing the task. Yes. If, if, I think is what is meant by being a professional, give the best output you can, upgrade yourself with the current technology, and discipline.

**Interviewer: It's quite complicated right.**
Respondent: Yes. The skill level must really good.

**Interviewer: Ok, now I would like to ask about you. What is your age?**
Respondent: I'm 34

**Interviewer: What is your role?**
Respondent: I'm more on technical, System Analyst

**Interviewer: What formal qualifications do you have?**
Respondent: I have a degree in Computer Science from UM (University Malaya)

**Interviewer: How much experience do you have?**
Respondent: I have been working with government since 2008, about 7 years.

**How long have you been working in your current organisation?**
Respondent: 7 years, since I joined the government.

**Interviewer: Ok, thank you very much for your time and there are good information and you give your opinion and what is your, you feedback is very informative for me and I get some different perspective from you. Thank you very much**
Respondent: Ok. You're welcome.

**Transcript of Interview with Director, Organisation A**

**Interviewer: Pertama sekali, terima kasih kerana sudi menjadi respondent saya. Soalan pertama mengenai pembangunan ICT sekarang nie, polisi kerajaan adalah membantu untuk apa, untuk pembangunan sistem maklumat secara dalaman?**
Respondent: Polisi kerajaan memang la, apa nie since, dulu-dulu when we start trade off in ICT development dekat public service nie, actually started for very long already. Ever since the first computerization kalau you nak fikirkan, dekat places like dulu, when we first started I remembered dekat apa, apa dia panggil dulu, Lembaga Letrik Negara (LLN). When we started on apa nama tu, billing system apa semua kan. So, early days memang, mostly were in-house developed. Banyak in-house development. So, we built our expertise kan. Development but later, during, I think, masa bila ya, early '90s I supposed, early or late '90s kan, then we begin this concept of outsourcing. We outsourcing kan. You, you are asking me about in-house development kan?

**Interviewer: Yes**
Respondent: Outsourcing. I think yang nie outsourcing nie more, macam dulu, the trend in the world masa tu kan especially in the UK. Kalau you remember zaman-zaman Margaret Thatcher. So, lots of outsourcing were done, lots of government functions, they tried to outsource to yang mana kita kata they shouldn't be core government functions you know, then banyak kita buat outsource in, then lepas tu banyak la kita buat outsource, outsourcing project including for ICT. The late '90s, and then bila starting of Multimedia Super Corridor kan, Multimedia Super Corridor pun banyak we started of outsourcing but now, you see bila, bila lots of government ICT projects were outsource. So, kita ingat that will be a good thing kan? Tapi I think in industry pun, the movement was towards outsourcing. Banyak, the banks you know they tried to, dia tak nak build, dia tak nak have too big ICT department, apa semua tu kan. So, they tend to outsource the project and then in that manner, they reduced their own ICT punya itu. Banyak, even government agencies pun ada yang buat macam tu, I remembered dulu kan, one of them, was

like MARA, MARA kan, even masa tu PNB also they did that. So, they are those too big PNB IT department and then slowly, became very big for them to manage them in-house macam tu kan. So, they keluarkan as a business unit, then later it became a company, standing on its own and finally, pisah terus. Itu yang jadinya macam PNB IT become HeiTech Padu sekarang. So, they were all actually, apa nama nie, IT Department of big corporations. You don't know that?

**Interviewer: No.**
Respondent: I think Felda also did the same, MARA also did the same, macam tu. MARA is the government agency kan? Tapi along the way kan, bila kita dah banyak outsourcing, so, itu yang in-house nie, development in-house dan maintaining the capabilities in-house jadi makin lama makin kurang because the focus was now, managing the outsource. The outsource kan. So, but then, it became, ini my own, nie la for internet, so, as we went on after Multimedia Super Corridor, come year 2000, millenium kan. So, actually the maintenance so big became very difficult. Bila, we cannot, kata orang tu continue to go on paying. So, after a while, dia kata mesti la you

**Interviewer: Upgrade?**
Respondent: Nak ambil-alih tu kan because you nak continue to maintain, upgrade apa semua tu kan. So, sapa nak buat? So, it's like continously paying and paying and paying and became more and more difficult la. Itu sebabnya we had some issues dulu masa Y2K. Masa Y2K tu kan, when we were considering the movement and our impact to, impact to our own application semua semua kan. Ha, so, banyak yang those yang outsource tu, they don't know whether how, how would be dia punya impact on them because they don't know the details kat dalam tu because orang lain buat kan.

**Interviewer: Orang lain buat.**
Respondent: But those yang actually did in-house development, they were very confident, dia kata we would not be affected by the change in the date because they know how they managed their punya sys, application. They know how to develop the application but those yang mana yang outsource because I was in MAMPU masa tu kan doing this, so, yang mana yang outsource tu, dia kata not sure la because yang buat tu not during their time kan. They just inhereted all those applications, cari documentation pun payah apa semua. So, don't know. So, unsure. So, they kata being unsure dia kata they have to take that maximum punya protection lah. Because they don't what's going to happen kan. Macam tu. So, government agencies pun banyak were in that situation la, they don't really know, don't understand dia punya applications. So, this I think was the, one of the bad outcome of outsourcing.

**Interviewer: Outsourcing**
Respondent : So, now, people are going back to

**Interviewer: Insourcing?**
Respondent: Insourcing, they building balik semula the competencies within and, and as much as possible try to reduce the need of outsourcing, to get vendors to develop kita punya applications kan. So, government pun building dia punya F skim nie kan, ICT Professional and then the development of ICT Professionals

dalam specific bidang. In fact, government has identified 8 bidang utama iaitu networking, strategic planning, database, application development, security, ada 8. All in ada 8 and looking at new areas as well. As we are on to build. So, this is all towards kita punya pembangunan la. So, this is how the policy has gone from the early days until now, memang and in government is giving a lot of incentive also now for in-house development. So, sebab kadang-kadang in-house development nie kita rasa kalau kita bagi kat diaorang, we pay millions kan. So, bila kita buat, actually we are saving the government millions. So, the government is looking it in that manner kan. So, now, what they are, the government has done, they have put up a trust fund. Ok, from that trust fund tu nanti, they are looking at, actually giving some tokens kepada in-house development of applications, whatever kan, that is the government can bagi some incentive la. So, the government jadikan satu trust fund. With, so, because, this clearly shows macamana now government is really wanting to build back its competencies dalam in-house development of applications kan because ICT is a very big portion of how's government see kita can improve the service delivery. So, if you were to, even look at the national budget kan, so, you'll see that the portion for ICT development is big, is huge. Itu sendiri dah menunjukkan how government give the importance for ICT development la. That would be that the long answer for your questions la, how I view the policy of government kan.

**Interviewer: Bagaimana pula dengan new direction kerajaan dalam meningkatkan peningkatan ICT dalam sektor awam?**
Respondent: Even, I mean the little I know kan, the agencies yang who kata orang tu, wanted actually outsource the whole IT department tu pun, now, we see them building it again. Because it just too expensive to just get somebody to do it for you kan. Dia boleh, because it's not one off punya investment it's long term punya investment. So, you cannot like continue macam 17 years, 20 years dengan company tu, it will be very very expensive because the need for kata orang tu, improvement and all that kan, is very fast. Hari ini the system was built like this, the next few days, your need changes. So, your need changes, so, if the application you do not know how to make the changes, macamana you nak effect the changes quickly. So, what do you do? You refer back to the company yang bina tu. Ok, fine, I can do that for you but more money please.

**Interviewer: More money**
Respondent: More money please. Macam tu. So, now, people see, it was good masa people were trying to do. I think even in the UK, you kat UK kan?

**Interviewer: Yes**
Respondent: You, you try to read and understand what is happening in the UK. Also people has moved from the policy of Margaret Thatcher dulu, now, they see, there was the demerit for outsourcing but eventually, the management of outsourcing became more and more complicated and difficult and cost about outsourcing actually continued to increase la. Dia bukannya decrease

**Interviewer: More maintenance, everything**
Respondent: Dia macam satu, macam paradox la kan because the intention was like that. But they find actually the cost kept on increasing rather than decreasing. So, there was no kata orang tu, even I think the banks kalau you read some of old literatures kan, you do some, I tak tau may be they are written but the ones that

I know even the banks tried to do that but eventually, those who did that back to square one. Because it's much easier to maintain the record keeping in-house, may be that's what ICT la, maybe it's work for other areas kan. Ok, habis dah kot

**Interviewer: Kalau nak tanya pasal job scope? Job scope macam sekarang nie, macam government bila kita promotion macam 41, 44 memang lebih kepada teknikal. Bila masuk 52, 54, dia kurang teknikal, lebih kepada management. Dari segi tu, expertise teknikal dia macam dah hilang**
Respondent: It's depend where you are. Kalau, kalau you have like an office like JPA nie, even you are at 54, you are still managing your technical lines because mmm... a lot of it, you still need to know your technical because you have someone up there. Dia yang selalunya move towards managerial is the one kat situ jer. Ok, you see but the rest still. So, kalau you are in the office where the, the top there is a 48, so, of course the 48 will do less of technical and more on managerial. Yang bawah-bawah tu will be done by dia punya 44 and 41. Ok, so, in agencies yang having 41 dia punya IT Manager dia, then he does also lot more on managerial and lesser of the technical because you will leave the technical pada dia punya programmers and all that. So, it depends where you are la in the office. So, generally speaking, if you are in the managerial position then of course, you will do little bit more of that rather than the technical. So, it doesn't mean that bila you dah 54, you dah 52, then you will be more of this and less of that, tu tak de. It depends where you are.

**Interviewer: Ok. Ada masa lagi?**
Respondent: Tak de dah. I'm very sorry la

**Interviewer: Tapi polisi tu saya dapat, yang penting tu sebab untuk managerial, top nie saya nak dapatkan polisi kerajaan**
Respondent: Itu lah dia. So, I have a lot to share actually because I was 21 years in MAMPU. 20 years, 21 years in MAMPU. Service wise, almost 31 years already. So, I have lots to share kalau you really want to talk to me about this.

**Interviewer: Ok. Terima kasih banyak.**

# APPENDIX 7 – CONSENT LETTER

## Consent Letter

**Persetujuan bagi Penyertaan dalam Penyelidikan**
***Consent for Participation in Research***

Tajuk Penyelidikan: Unsur-unsur utama dalam Amalan dan Pelaksanaan Sistem Maklumat Kerajaan
*Topic of Research: Key Elements in the Implementation and Practice of e-Government Systems*

Penyelidik: Azmi Omar, The Robert Gordon University, Aberdeen
*Researcher: Azmi Omar, The Robert Gordon University, Aberdeen*

Saya telah disediakan dengan maklumat dan memahami mengenai kajian ini dan syarat-syarat kerahsiaan. Saya telah diberi peluang untuk bertanya soalan dan menjawab dengan rasa puas hati.
*I have been provided with and have understood the information regarding this research and the confidentiality conditions. I have been given the opportunity to ask questions and have them answered to my satisfaction.*

Saya bersetuju untuk ditemuduga oleh Azmi Omar bagi tujuan kajian ini untuk sumbangan kepada ijazah PhD, penghasilan thesis dan penerbitan kertas persidangan. Saya juga faham bahawa saya boleh menarik diri daripada kajian ini dalam masa 30 hari selepas pengumpulan data/temuduga.
*I agree to be interviewed by Azmi Omar for the purpose of this research contributing towards his PhD degree and resultant thesis and conference paper publications. I also understand that I may withdraw from this research up to 30 days after the data collection/interview.*

Saya memberi kebenaran untuk pengumpulan data ini dan menggunakan pendapat, persepsi, maklumat dan pengalaman saya dalam penyelidikan ini.
*I give my consent to the collection and use my opinions, perception, information and experiences during this research.*

Saya bersetuju untuk merakam temuduga ini (bagi mengurangkan risiko penemuduga tidak dapat mencatat semua maklumat yang diberikan oleh ditemu duga itu).
*I agree to have the interviews sound-recorded (to reduce the risk of interviewer not being able to note down all information provided by the interviewee).*

YA ☐ *YES* TIDAK ☐ *NO*

Saya ingin menerima satu salinan penerbitan berdasarkan temuduga ini
*I would like to receive a copy of any publications that are based on these interviews.*

YA ☐ *YES* TIDAK ☐ *NO*

Jika YA, sila sediakan emel di bawah.
*If yes, please provide an email.*

---

Nama : _____
*Name*

Gred : _____
*Grade*

Tandatangan: _____ Tarikh: _____
*Signed* *Date*