

ICT SHARED SERVICE FRAMEWORK FOR E-GOVERNMENT AMONG
ORGANIZATIONS

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This thesis is dedicated to:

Ayah & Ama

who always be role model and inspiration for me

Ibuk

who carries a lot in order to help me to achieve my dreams

Sisters

who give me support despite their young age

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ABSTRACT

Information and Communications Technology (ICT) shared service is defined as sharing of ICT service by different units within an organization or multiple organizations, which can occur from different locations. Inter-organizational ICT shared service helps to improve decision making in delivering service to users besides improving working relationship between staffs through collaboration between government organizations. However, current research lacks a holistic view of how to implement an appropriate inter-organizational ICT shared service in e-government. This research developed an ICT shared service framework for e-government among organizations as a guideline to improve service and enlarge ICT shared service. Qualitative data were collected from a single case study comprising multiple organizations. Data were gathered from the practitioners of service provider who have experience in using and managing single service both on e-government intra-organizational and inter-organizational ICT shared service. The interviews also involved representatives from other organizations who have experience in using and managing single service of inter-organizational ICT shared service. Qualitative data analysis interactive model was used to analyze the interview results. Success factors and challenges were identified based on service stakeholders' views. In addition, Resource Dependence Theory (RDT) and Dependency Network Diagram (DND) as well as success factors and challenges were analyzed to identify the dependencies between stakeholders. These dependencies were used to formulate the proposed framework. The stages of Watson and Mundy's e-government framework were used as the basis in developing the framework due to its suitability for organization to test the feasibility of the service. It consists of three stages: initiation, infusion and customization focusing on stakeholders' involvement and their dependencies in every stage. Next, the framework was verified by practitioners using walkthrough of a different case study. The aim of this framework is to help organizations to clearly identify their process chain and dependency with other organizations during implementing inter-organizational ICT shared service through the thorough step-by-step process. This Inter-Organizational ICT Shared Service Framework for E-Government has been designed to allow an experienced and knowledgeable organization in intra-organizational ICT shared service to expand their service to be used by multiple organizations.

ABSTRAK

Perkhidmatan perkongsian Teknologi Maklumat dan Komunikasi (ICT) ditakrifkan sebagai perkongsian perkhidmatan ICT oleh unit yang berlainan dalam organisasi atau organisasi berganda, yang boleh berlaku dari lokasi yang berbeza. Perkhidmatan perkongsian ICT antara organisasi membantu meningkatkan keputusan dalam menyampaikan perkhidmatan kepada pengguna selain dapat meningkatkan hubungan kerja antara kakitangan melalui kerjasama antara organisasi kerajaan. Walau bagaimanapun, penyelidikan semasa tidak mempunyai sebuah pandangan holistik tentang cara untuk melaksanakan ICT antara organisasi yang sesuai dalam e-kerajaan. Kajian ini membangunkan rangka kerja perkongsian ICT untuk e-kerajaan sebagai panduan untuk meningkatkan perkhidmatan dan memperluaskan perkhidmatan perkongsian ICT. Data kualitatif dikumpulkan dari satu kajian kes yang terdiri daripada pelbagai organisasi. Data dikumpulkan dari pembekal perkhidmatan yang mempunyai pengalaman dalam menggunakan dan mengurus perkhidmatan perkongsian ICT dalam satu organisasi lain yang mempunyai pengalaman dalam menggunakan dan mengurus satu perkhidmatan ICT antara organisasi. Model analisis data kualitatif interaktif digunakan untuk menganalisis hasil temuduga. Faktor keberhasilan dan cabaran telah dikenal pasti berdasarkan pandangan pihak berkepentingan. Di samping itu, Teori Ketergantungan Sumber Daya (RDT) dan Rajah Rangkaian Ketergantungan (DND) serta faktor keberhasilan dan cabaran dianalisis untuk mengenal pasti kebergantungan antara pihak berkepentingan. Kebergantungan ini digunakan untuk merumuskan rangka kerja yang dicadangkan. Peringkat rangka kerja oleh Watson dan Mundy digunakan sebagai asas untuk membangunkan rangka kerja untuk menguji kebolehlaksanaan perkhidmatan tersebut. Ia terdiri daripada tiga peringkat: inisiasi, infusi dan penyesuaian yang memberi tumpuan kepada penglibatan pihak berkepentingan dan kebergantungan mereka di setiap peringkat. Seterusnya, rangka kerja itu disahkan oleh para pengamal yang menggunakan kajian kes yang berlainan. Tujuan rangka kerja ini ialah untuk mengenal pasti proses dan kebergantungan dengan organisasi lain semasa melaksanakan perkhidmatan perkongsian ICT antara organisasi melalui proses langkah demi langkah secara menyeluruh. Rangka Kerja Perkhidmatan Bersama ICT Antara Organisasi untuk E-Kerajaan telah direka untuk membolehkan organisasi yang berpengalaman dan berpengetahuan dalam perkhidmatan ICT satu organisasi untuk memperluaskan perkhidmatan mereka untuk digunakan oleh pelbagai organisasi.

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LIST OF ABBREVIATIONS

1Gov*Net	-	Government Integrated Telecommunications Network
1GovUC	-	1Government Unified Communication
1MTC	-	1Malaysia Training Centre
CAQDAS	-	Computer Assisted Qualitative Data Analysis Software
CC	-	Computer Center
CICT	-	Centre for Information and Communication Technology
CPU	-	Central Processing Unit
DCT	-	Dynamic Capabilities Theory
DND	-	Dependency Network Diagram
DP	-	Decision of Provider
DR	-	Decision of Recipient
E-	-	Electronic
ELSP	-	English Language Support Programme
FW	-	Framework
HPC	-	High Performance Computing
HR	-	Human Resources
ICT	-	Information and Communications Technology
ID	-	Identity Document
IO	-	Inter-Organizational
IO-ICT	-	Inter-Organizational ICT
ITG	-	IT Governance Theory
JPNJ	-	<i>Jabatan Pelajaran Negeri Johor</i>
KPI	-	Key Performance Indicators
MAMPU	-	Ministry of Administrative Modernization and Management Planning Unit
MDEC	-	Malaysian Digital Economy Corporation
MOHE	-	Ministry of Higher Education

MPM	-	<i>Majlis Peperiksaan Malaysia</i>
MUET	-	Malaysian University English Test
MyLinE		Online Resources for Learning in English
MYREN	-	Malaysia Research and Education Network
RA	-	Research Assistant
RADIS		Research and Development Information System
RBV	-	Resource Based View
RDT	-	Resource Dependence Theory
RMC	-	Research Management Centre
RO	-	Research Officer
ROT	-	Real Options Theory
SA	-	Stakeholders Analysis
SF	-	Success Factors
SLA	-	Service Level Agreement
SOP	-	Standard Operational Procedure
SS	-	Shared Service
SSC	-	Shared Service Center
SSM	-	Soft System Methodology
TCE	-	Transaction Cost Economics
UM		Universiti Malaya
UMT	-	Universiti Malaysia Terengganu
UniMAP	-	Universiti Malaysia Perlis
UNMC	-	The University of Nottingham Malaysia Campus
UPM		Universiti Putra Malaysia
USM		Universiti Sains Malaysia
UTM	-	Universiti Teknologi Malaysia
WAN	-	Wide Area Network

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Shared service is commonly used to remove the duplication of systems and activities in large organization which has many units under that organization. It has demonstrated cost savings, improved decision making, reduced risk, improved service delivery and business process effectiveness (Gould and Magdieli, 2007; Janssen and Joha, 2006a; Janssen *et al.*, 2012; Paagman *et al.*, 2015). Shared service is used in sharing the business processes, services and businesses expertise. It has been practiced in both private and public organizations (Borman and Janssen, 2008; Mustafa Kamal, 2012; Wagenaar, 2006). Shared service has been implemented for a few years which influence the transformation of technology, economic and environment. Previously, shared service is well known in accounting and financing (Cooke, 2006; Ulbrich, 2006; Webster, 2007); but now it is also famous to be used in human resources organization, procurement, customer services, ICT services and public administration (Furtmueller, 2012; Gordon Murray *et al.*, 2008; Janssen *et al.*, 2009; Tate and Furtmueller, 2013).

This phenomenon has also gained governments' attention to adopt shared service for e-government, categorized as ICT shared service in government (Paagman *et al.*, 2015; Raudla and Tammel, 2015). Information and Communications Technology (ICT) is defined as all forms of information technology (both of hardware and software) and telecommunication equipment such as internet, mobile phone (radio waves transmit) and landline phone (wired connection network) which is used to create, design, store, transmit and manipulate the information (Chandler and Munday,

2011; Daintith and Wright, 2008; Rouse, 2005). Thus, ICT shared service allows an organization to share business processes, services and businesses expertise by using all forms of those ICT equipment needed. Few governments such as Australia and United States have been trying to implement ICT shared service in their local, state and national governments since 1990s (Kearney, 2005; Tomkinson, 2007). Majority of government's respondents believe that implementing ICT shared service in public sector such as e-government can support the government organizations' strategy to attain its goals and public management issues (Burns and Yeaton, 2008; Deloitte, 2005; Paagman *et al.*, 2015; Raudla and Tammel, 2015).

1.2 Research Background

Continuing growth and needs of end users, business partners and all units within organization toward electronic services drive an organization to provide efficiency, effective, faster delivery and good quality of services in minimal costs. It happens both in private and public organizations. However, their existing systems have many duplication activities and resources which give same process and result between the units of that organization. To provide better service and remove the duplication of the activities, shared service is being implemented into the organizations. Shared service is defined as an organizational system that can spread activities across units within an organization or between organizations (Miskon *et al.*, 2013). The use of shared service is sought by numerous organizations to reduce the ICT costs significantly because of the pressure from today's economic crisis while the quality of service is required to increase (Furtmueller, 2012; Redman *et al.*, 2007; Tate and Furtmueller, 2013). The understanding toward what service can be shared and what the appropriate approaches of shared service implementation suitable need to be revealed. It needs to determine potential implementation of shared service within an organization or across organizations, because it often results in mixed reactions due to vast uncertainty and complex service surrounding it. The difference of shared service arrangement type will result different organizational involvement and the process of sharing arrangement.

In this study, an attempt to explore the implementation of intra-organizational ICT shared service to inter-organizational ICT shared service is done. Intra-organizational shared service is defined as a service being shared by multiple units within an organization in which it has no separate entity that overlooks the sharing arrangements. Meanwhile, inter-organizational shared service is defined as a common service being shared by two or more related units within an organization which has no separate entity to manage the sharing arrangement; at the same time, that organization shares the service with other organizations (Miskon *et al.*, 2013). In early studies, it was found that inter-organizational ICT shared service provides benefits for the organizations especially for service improvement and cost saving (Janssen *et al.*, 2009; Janssen *et al.*, 2010; van Fenema *et al.*, 2014). It is important to identify the benefits and risks involved in shared service and ensure that there is right composition in implementing inter-organizational ICT shared service for success. The safest way to minimize the risk during implementation ICT shared service is usually derived from best practices of successful shared services in another government, as ICT shared service in government just at the state of beginning (Fielt *et al.*, 2014). It also can be done by expanding the existing intra-organizational shared service to inter-organizational shared service (van Fenema *et al.*, 2014).

This study identified that Malaysia has a growing e-infrastructure, strong e-government initiatives and advance technical expertise. It has opportunity to implement ICT shared service on it. A new division named ICT Infrastructure Shared Services and Security Development Division under Malaysian Administrative Modernization and Management Planning Unit (MAMPU) (can be accessed on www.mampu.gov.my) was established in September 2008 to strengthen ICT shared services initiative for government to support e-government project. They started to implement ICT shared services in government from 2011 in order to achieve a vision to fully transform e-government services by the year 2020 (MAMPU, 2017). At present, the implementation of ICT shared services initiative in Malaysia e-government is still in the infant stage (MAMPU, 2017). There are several existing ICT shared services initiatives from government in Malaysia. The literatures review and observation towards current situation in Malaysia based on shared services typology, stakeholders' involvement and service itself showed that most of those ICT

shared services initiative in Malaysia are classified as intra-organizational ICT shared service. Those existing intra-organizational ICT shared services have opportunity and ability to be expanded and used by others too. It gives a chance to move it becomes inter-organizational ICT shared service which enables one service to be used by multiple organizations.

1.3 Problem Statement

Previous studies revealed the opportunity for intra-organizational shared service to be transformed to inter-organizational shared service where the service can be expanded and used by many organizations (Crossan and Apaydin, 2010; van Fenema *et al.*, 2014). Previous trend in an organization is where the value creation of a service occurs with the boundaries of an organization (Binder and Clegg, 2010). However, this view has changed as many organizations try to look beyond their organizational boundaries to obtain new knowledge, technological advancement and innovations (Cropper *et al.*, 2009; Kaats and Opheij, 2014; Lichtenthaler, 2011). In ICT shared service area, the organization which has been sharing the service within organization also tends to improve the performance by involving in inter-organizational shared service to create added value that is beyond an organization's service (van Fenema *et al.*, 2014).

Other organizations are willing to involve in inter-organizational ICT shared service when they lack of resources whether cost, knowledge, technology (Janssen *et al.*, 2010; van Fenema *et al.*, 2014). This situation requires them to use different strategies to get it from the external environment (Suska and Weuster, 2016). The performance of those organizations can be enhanced by inter-organizational ICT shared service because it helps them to get things done more efficiently with less risk. A synergistic effect can influence all organizations which involve in inter-organizational ICT shared service. Despite of this increasing attention to improve the use of shared service, current research lack of holistic view of how to implement appropriate ICT shared service among organizations in e-government which involves different locations, vision, mission and organizations' background. Chandok *et al.*

(2016) mentioned that many shared service organizations are not prepared for full-scale shift to digital ways of working. Most of those organizations should improve the internal processes, interact with customer and other organizations more efficiently in order to create innovative services (Chandok *et al.*, 2016).

Grant and Tan (2013) described inter-organizational as the relationships between autonomous organizational entities characterized by the work, resource and information flow; but it becomes challenging since the decision making is shared while there is diversity of stakeholders' interests. Caldwell and Howard (2010); Chandok *et al.* (2016); Porter and Kramer (2011); van Fenema and Beeres (2010) mentioned that the complexity of inter-organizational shared service drives the organizations to have new strategies to implement it. In fact, it is also realized that shared service success is not guaranteed, better strategies are always needed (Borman and Janssen, 2013; Kerr, 2011; Wagenaar, 2006). As the increasement of potential and interest for shared service to achieve more saving and further improvements in operational efficiencies, it is thus worthwhile to investigate the potential for sharing the same service among organizations especially in e-government. It is the way those organizations arrange the service and the forms that they take to deliver the outcomes; as well as the way to develop and sustain the relationships among organizations over time.

Furthermore, different stakeholders in ICT shared service are realizing that there are lots of potentials to share the services and resources to provide successful ICT shared service. However, those stakeholders have different perspectives on how to collaborate to share the service to create value. Inter-organizational ICT shared service has complex situation among its stakeholders which can lead to failure of ICT shared service implementation across organizations. Creating a shared understanding among organizations involves different aspects including what service can be shared, issues to be solved and benefits to be gained for each of stakeholders involved. It also needs to identify which stakeholders have possibility and capability to join the shared service among organizations, in order to avoid failure in implementing shared service in e-government.

These complexities could be addressed by redefining and innovating intra-organizational shared service to inter-organizational shared service in terms of the services, stakeholders, modify the process and expected output value (Crossan and Apaydin, 2010; van Fenema *et al.*, 2014). The researcher had identified existing e-government frameworks but none of those were implemented for ICT shared service study. A comprehensive and well-designed e-government framework might save a lot of time and money during the implementation of ICT shared service. Hence, it leads to the question of how to upgrade the use of service from intra-organizational ICT shared service towards inter-organizational ICT shared service by deliberating the current situation and existing e-government framework as a basis in developing the proposed ICT shared service framework to be used among organizations since there are many benefits can be achieved.

1.4 Research Questions

Strong interest from the researcher in identifying ICT shared service toward e-government to solve knowledge gaps, commenced with the sets of research questions:

- RQ1: What are the current situations of ICT shared service in e-government?
 - RQ1a: What is the existing framework that suitable to be used for the basis of proposed ICT shared service framework in e-government?
 - RQ1b: What are the existing ICT shared service initiatives in the Malaysia government?
 - RQ1c: Who are the stakeholders involve in ICT shared service?

- RQ2: What are the challenges and success factors (SFs) that influence inter-organizational ICT shared service implementation in e-government?

- RQ3: How to transform intra-organizational ICT shared service to inter-organizational ICT shared service by utilizing the identified challenges and SFs with the stakeholders' involvement?

1.5 Research Objectives

There are three objectives for this research that are used to achieve the answer of the questions above:

- RO1: To understand the current situation of ICT shared service in e-government including existing framework which is suitable to be used for ICT shared service study in e-government, the existing ICT shared service initiatives in Malaysia e-government and the stakeholders involved.
- RO2: To identify and explain success factors and challenges in inter-organizational ICT shared service implementation to enhance the quality of the framework as well as to validate the framework.
- RO3: To propose a framework that enables the transformation from intra-organizational ICT shared service to inter-organizational ICT shared service by utilizing the identified challenges and success factors with the stakeholders' involvement.

Figure 1.1 illustrates the relationships of research questions (RQ1, RQ2, RQ3) and thesis chapters (Chapter 2, Chapter 4, Chapter 5 and Chapter 6) that address each of those questions. RQ1 to identify the current situations of ICT shared service in e-government will be addressed in Chapter 2 (for answering RQ1a), Chapter 4 (for answering RQ1b) and Chapter 5 (for answering RQ1c), while RQ2 about success factors and challenges in inter-organizational ICT shared service implementation will

be addressed in Chapter 5. Lastly for answering RQ3 about the framework of inter-organizational ICT shared service implementation, it will be explained in Chapter 6.

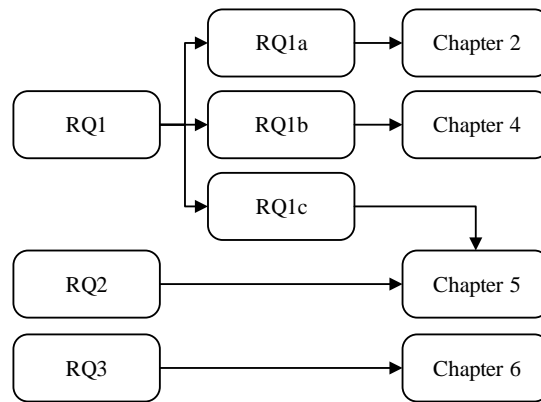


Figure 1.1 Mapping of research questions to thesis chapters

1.6 Significance of Research

This study comes with significance of research to the current literature. It is discussed in term of theoretical, practical and methodological significance. First, this study has significance to the body of knowledge of ICT shared service implementation among organizations by focusing on transforming intra-organizational ICT shared service to inter-organizational ICT shared service in e-government. It helps the stakeholders to deal with the situation and their dependencies with others during ICT shared service implementation.

This study adopts and extends the use of existing e-government framework by previous researchers to be used for ICT shared service domain. The chosen framework was selected after the researcher finished the data analysis. The researcher found out that the chosen framework as the most appropriate framework which can be used as the basis to show all the study findings. This framework helps the researcher to identify the implementation process of an ICT service to be shared among organizations in e-government.

For practical significance, inter-organizational ICT shared service framework is designed to allow an experienced and knowledgeable organization in intra-organizational ICT shared service to expand the service to be used by other organizations. It is important to minimize the risk as inter-organizational ICT shared service is complex and requires high coordination from all stakeholders. It helps those organizations to clearly identify their process chain of inter-organizational ICT shared service implementation through the thorough step-by-step process. Additionally, this study provides a decision tree and its table guideline as the tools for identifying ICT shared service typology to ensure the accuracy in positioning a service to its ICT shared service typology as part of methodological significance.

1.7 Scope of Research

This study is conducted toward ICT shared service initiative in e-government among organizations with majority users and have sharing concept in the process of delivering the service. It aims to propose an inter-organizational ICT shared service framework. This framework is designed specifically for transforming the existence ICT shared service in an organization becomes ICT shared service to be used among organizations in e-government. It focuses on stakeholders' point of view in managing and using ICT shared service in e-government. Unit of analysis for this study is the organizations in e-government. The study is done across organizations which use the same single service. The study is conducted with the practitioners; it consists of manager and IT officers of service provider who have experiences in using and managing single service of e-government as intra-organizational and inter-organizational ICT shared service. The study also involves representatives and practitioners of other organizations as service recipients who have experiences in using and managing that single service of e-government as inter-organizational ICT shared service in their organizations.

1.8 Thesis Outlines

This section provides an overview of the overall thesis structure. It summarized each thesis chapter in terms of main objectives, main research outcomes and the research questions that addressed those outcomes. Chapter 1 introduces the research topic by providing a background and problems of the study. It gives the thesis reader a brief introduction about the whole research.

Chapter 2 presents literature review of shared services in e-government to identify gaps based on previous researches. It also helps the researcher to review previous frameworks to be used as basis framework in this study. It also reviews theories which were used to study shared services based on previous researches. Chapter 2 contributes in producing initial conceptual framework and answering RQ1a.

Meanwhile, Chapter 3 aims to explain the research methodology and decide appropriate way to test, analyze and verify the data to solve the problems stated in Chapter 1.

Chapter 4 describes the result of analysis toward existing successful ICT shared service implementation in several e-government. This chapter also identifies existing ICT shared service initiatives in Malaysia e-government. The case study of MyLinE for further study is chosen. Chapter 4 also contributes in answering RQ1b.

Chapter 5 explains the evolution and stakeholders analysis to identify stakeholders' involvement in MyLinE service. Then it also explains the identified point of arrangement, success factors and challenges in implementing inter-organizational ICT shared service based on stakeholders' point of views as result of interview findings supported by literature reviews. Chapter 5 contributes in answering RQ1c and RQ2.

It is followed by Chapter 6 which explains the design and development of inter-organizational ICT shared service framework. This chapter presents the details of

qualitative data analysis findings toward stakeholders' involvement during inter-organizational ICT shared service implementation. As result, a proposed inter-organizational ICT shared service framework in e-government is produced. The verification of proposed framework by key personnel of service is also presented. It shows how the proposed framework is tested through a simulation of scenario that uses another inter-organizational ICT shared service case study. Then, it presents a final revised version of inter-organizational ICT shared service framework in e-government which contributes to overall understanding of inter-organizational ICT shared service implementation. Chapter 6 contributes in answering RQ3.

Finally, Chapter 7 concludes the study where all research questions are addressed and main research contributions are identified. Research reflection, study limitations and recommendations for future research are also presented.

1.9 Chapter Summary

This introductory chapter commences with the background and problems of research domain. Research questions and research objectives are next presented to provide insights about focus of the study. The chapter is then proceeded by providing research significance and scope of study. Finally, Chapter 1 is concluded with description to the overall structure of the remaining chapters of this thesis. The next chapter will review relevant literature to provide further understanding about study's context and find the gaps of the study.

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