

Malaysian e-Government Implementation Framework

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ABSTRACT

Information Technology (IT) has changed the way most business units in the private sector conduct their operations. Reduced costs and simplified processes are but simply some of the benefits being reaped by the private sector through improve technology usage.

IT is now seeping through to the public sector which is labeled more conservative compared to the private sector through e-Government initiatives. E-Government initiatives are to ensure that the public sector not only keeps up with the race, but slowly take the lead in the transformation process that is affecting everything including societal structure.

Malaysian government has identified initiatives to implement the modernization of the public sector. MSC is Malaysia's initiative for the global information and communication technology (ICT) industry. The e-Government initiative was launched in Malaysia in the year 1997 by the former Malaysian Prime Minister, Tun Dr Mahathir Mohamad as one of the seven flagships of the Multimedia Super Corridor (MSC) initiative.

The e-Government initiative focuses on increasing efficiency and at the same time reducing operational costs of public services offered. All government agencies will be equipped to quick start to offer public services through e-Government if there is a standardized framework for guidance.

Keywords: organizational effectiveness, operational efficiency, e-Government, implementation framework, Malaysia.

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CHAPTER 1: INTRODUCTION

1.1. Introduction of e-Government in Malaysia

The Malaysian government, spearheaded by the Malaysian Administrative Modernization and Management Planning Unit (MAMPU) developed the Public ICT Strategic Plan in order to align various public agencies' ICT initiatives to the Malaysian government ICT vision, and also to ensure the quality and efficiency of service to the Malaysian citizen. Following the launch of the ICT plan, the e-Government website, was launched and is still under construction for more interactive functions. The myGovernment Portal (www.gov.my) acts as the one-stop source of Malaysian government information and services for the citizens.

This thesis highlights the initiatives implemented, challenges that are faced during implementation, and the need for an effective and efficient e-Government implementation framework.

In the following sections of this chapter, the researcher presents the statement of problem that is being researched, the research questions, definition of terms and last but not least the significance of this study.

1.2. Statement of Problem

The Malaysian government is moving towards becoming more efficient operationally by collaborating across traditional departments. The government also has to become more

responsive towards the Malaysian citizens' needs. Thus, the government faces an increased pressure to form an effective e-Government. The e-Government is not only meant to bring public services online, but is also focused mainly in reducing overall operational costs by transforming the e-Government into an organization that generates both social and economic value effectively. Thus, effectiveness and efficiency factors have to be investigated and prioritized. Malaysian public agencies need a clear insight to the benefits.

Anything that is planned and will be executed requires a measurement yardstick to track the progress. There is a need to illustrate and benchmark the Malaysian e-Government achievement, as compared to the progress of other e-Governments of peer countries and their initiatives.

Barriers and challenges that slows down the implementation of the e-Government initiative needs to be made known so that it can be tackled at early stages. Government agencies are developing websites for the purpose of web presence while unintentionally creating scattered clusters of static information on the Internet. The formation of these decentralized services in turn gives customers the run-around when they are seeking public services. If there is not a top-down e-Government implementation framework present to ensure integrated and customer-centered online service delivery, this condition will progress for the worse.

The implementation of e-Government requires strong leadership and a vision. It also requires a comprehensive strategy that is not only benchmarked on global best practices, but also sensitive to existing political and economic conditions and realities. For e-Government to become a reality, governments, in consultation with stakeholders, should

follow a common nationwide strategic framework, which articulates the government's vision, targets and milestones, technical approach and standards for e-Government systems. Such a framework should also address information privacy, security, maintenance, and interface standards.

1.3. Purpose of Study / Objectives

The researcher aims to examine the e-Government implementation and strategies in the Malaysian public sector with the following objectives in mind:

- a) To investigate the benefits of e-Government initiatives in terms of organizational effectiveness and process efficiency.
- b) To understand the current status and progress of the e-Government initiative in Malaysia as compared to peer countries.
- c) To identify the challenges in implementing an effective e-Government for Malaysia.
- d) To propose an effective e-Government implementation framework for the Malaysian e-Government.

1.4. Research Questions

The main research questions of the study encompasses the current initiatives of e-Government, the benefits achieved from e-Government, as well as the challenges faced during its implementation as listed below:

1. What is the relationship between government initiatives and benefits from operational efficiency and organizational effectiveness?

Method: Public Agency Professional Survey

Expected findings: Outcome of the implementation of e-Government initiatives in terms of operational efficiency and organizational effectiveness towards the online public services delivery channel.

2. What are the processes, organizational and technological factors challenging the effective implementation of an e-Government?

Method: Public Agency Executive Interview

Expected Findings: Barriers and success factors of implementing the e-Government initiatives in Malaysia.

3. Where does the Malaysian e-Government stand compared to the rest of the world (Peer countries such as Mexico - economic similarity, Taiwan- population similarity and Germany- geographical/land area similarity)?

Method: Archival Research

Expected Findings: The current standing of the Malaysian e-Government versus peer countries such as Mexico, Taiwan and Germany.

1.5. Definition of Terms

Terms used in this research are defined in this section to facilitate smooth and clear reading for all categories of readers. Some of the terms defined are e-Government, e-Government value chain and stakeholders, effective e-Government, and efficient e-Government.

1.5.1. E-Government, an Introduction

A number of definitions for e-Government have been offered in existing literature. Many terms such as “digital government”, “inter-networked government” (Tapscott, 1995) and “government online” have been used. The researcher deems all these terms to be synonymous. E-Government in simplest terms can be described as the use of ICT within government to make operations more efficient, improve quality of service and offer an easy access for citizens to government information and services (Kraemer and King, 2003). Kraemer also cited that Senators Lieberman and Thompson defined e-Government as a way “to better use IT advances to achieve greater effectiveness and to provide citizens easy, electronic access to government programs, services and information.”

The term e-Government also refers to the planned and coordinated use of ICT to strengthen the core functions of public institutions. Not every computer in use in the public sector amounts to e-Government. When electronic data processing emerged on a more widespread basis, its initial focus was on isolated and targeted modernization efforts in a limited number of key sectors. Today, however, the focus is on the networking of workplaces, administrations, and political institutions as well as on Information and Communications Technology based communication with customers or citizens. This calls for concepts that are geared to integrating the modernization goals and investment planning of various institutions and based on a thorough examination and analysis of service portfolios and the demand for public services.

According to a paper by the German Development Institute (2003), the aim of e-Government is to open up new internal and external communications channels, to simplify

administrative procedures, to improve the accessibility of public actors and services, and to enhance access to information.

This often also means that new technologies become the vehicles of democratic, customer-oriented, and decentralized models of political decision-making and public administration (Peters, 2001 and Kettl, 2000). If these technological models are to be translated into practice, initiatives must be embedded in an overall concept that takes account of both customer and target-group demand and the challenges posed by internal administrative cooperation and networking.

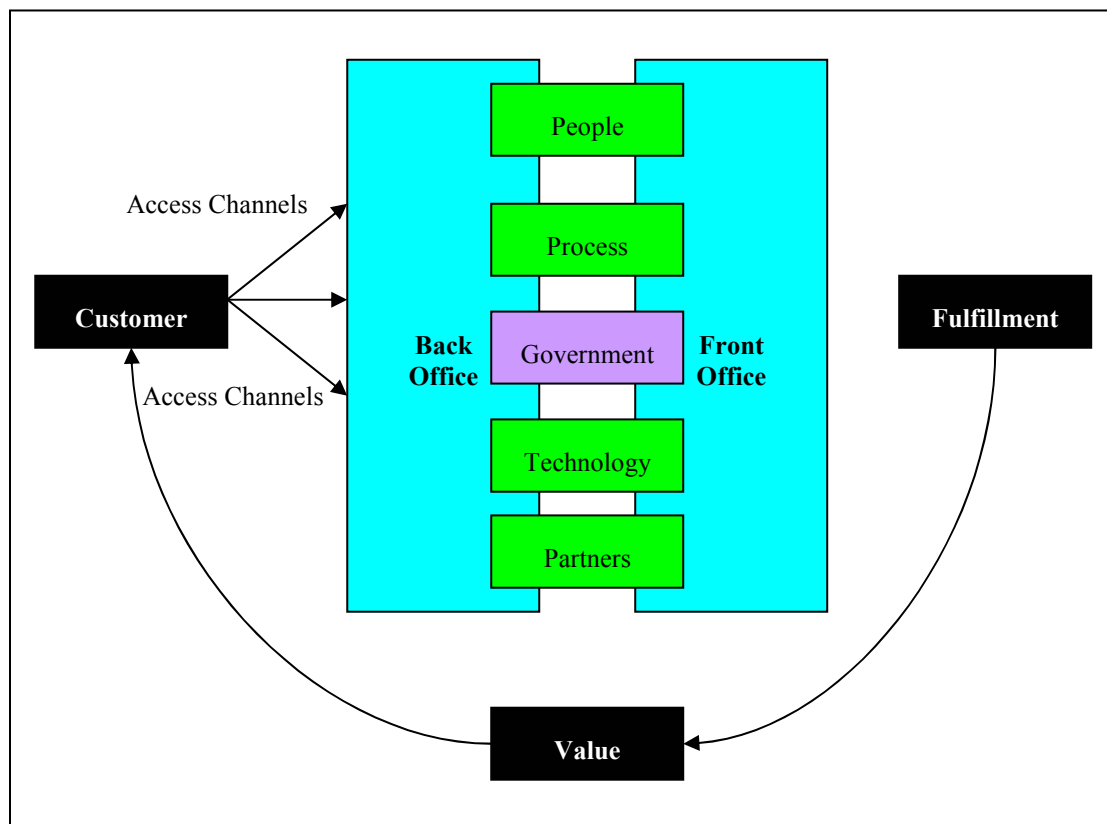
1.5.2. E-Government Value Chain and Stakeholders

An e-Government interacts with and provides services to various stakeholders such as citizens, businesses, and agencies that form a government. The goal in delivering any service is fulfilling a customer need. The best way to view services is to group them into value chains (Porter, 1985) i.e. chains of differing lengths that coincide with the wide complexity of customer needs. A generic e-Government value chain may be depicted by the Figure 1.1 below.

The Government-to-Citizen (G2C) relationship represents the services created to facilitate citizens' needs. Citizens seek more reliable and accessible services from the public sector. This implies that citizens should be able to carry out variety of tasks that involves multiple agencies, from a single access point. Increased interactions between government and citizens encourage citizens to become more participative thus allowing the government to

respond to their needs more effectively. This category of relationship desires electronic services and infrastructure.

The Government-to-Government (G2G) relationship represents internal systems and functions that form the backbone of a government. This relationship is more complex than a G2C relationship because it involves data sharing and interaction between government actors whether inter- or intra-agency. Government actors include employees, departments, agencies, ministries, and even other governments. Heeks (2001) introduced e-Administration for this category of relationship.



(Source: Deloitte Research, 2002)

Figure 1.1: E-Government value chain

Finally, the Government-to-Business (G2B) relationship which is receiving relatively the most attention, in its simplest form is procurement. Businesses have the opportunity to simplify regulatory processes, cut through red tape, and keep legal compliance and start operations faster through the online facilities. G2B also holds the potential of bringing public and commercial services together to offer services as a one-stop shop on a non-stop operation (Lawson, 1998).

1.5.3. Effective e-Government

Effective is defined as the act of producing or capable of producing an intended result and having a striking effect. More specifically, e-Governments should be capable of producing effective online public service channel to all its customers i.e. citizens, businesses, governments and employees. The indicators of an effective e-Government are as follows:

- Increased service value
- Increased awareness of county responsibilities, services and results
- Enhanced citizen involvement in government initiatives
- Increased respect and appreciation of ethnic and cultural diversity
- Increased citizen self-sufficiency
- Clear about objectives intended to achieve

An e-Government strives to be an effective employer, for civil servants, that has at least some of the following criteria:

- Enhanced workforce retention and recruitment

- Increased employee knowledge, skills and abilities
- Increased employee motivation and satisfaction
- Improved communication and information management
- Increased literacy and workforce preparedness

An e-Government tries to deliver the following qualities to businesses that require dealing with the government:

- Simplified processes
- Reduced red tape
- More efficient legal compliance enforcement

An effective e-Government aims to deliver all of the above and more to the stakeholders. However, there is a question of whether effectiveness should be attempted at whatever cost. Thus, the researcher also introduces the efficiency aspect of an ideal e-Government. This term is defined in the next section.

1.5.4. Efficient e-Government

Although used synonymously often, there is a fine line between effectiveness and efficiency that can be observed. Effectiveness, as defined above, is concerned about the final deliverable or value that is produced, whilst efficiency refers to being effective without wasting time, effort or expense. Here, efficiency is clearly distinguished from effectiveness. Efficiency is often the result of a continuous improvement of processes. In e-Government initiatives, rarely are efficiencies encouraged "at all costs", instead it is about

being balanced with risk and cost. The criteria of an efficient e-Government that will be the focus of this research are as follows:

- Increased employee productiveness
- Reduced or avoided costs
- Improved financial management
- Maintain affordable and competitive tax rate for taxpayers
- Prioritization of initiatives
- Constant review whether anything done by the government would be better done by the private sector (outsourcing)
- Monitor of whether things are being done in an efficient way such as maximizing the limited resources available, understanding the economic costs, and other implications of its own decision and behavior.

However, care should be given that efficiency is not misunderstood to be about downsizing, streamlining, contracting out or cost-cutting.

1.6. Significance of Study

This study about the effectiveness and efficiency of the Malaysian e-Government implementation was done for the following major reasons:

- a) It is necessary to identify the benefits of the implementation of the e-Government initiatives in order to ensure prioritization of the identified initiatives.
- b) There appears to be lack of direction and communication of e-Government implementation due to untrusting stakeholders for various reasons. The challenges are highlighted and presented upfront so that it can be tackled at early stages.

- c) The Malaysian government needs to know where it stands in terms of e-Government implementation compared to its peer countries to mark its current progress of milestone achievement.
- d) An integrated framework that allows better flow of information between different government agencies is required to ensure a proper and unified implementation of the e-Government initiatives.
- e) To create a framework that could become a standard for all government agencies to follow when embarking on the e-Government implementation.
- f) To adopt a service oriented architecture that would create a customer-centric online delivery channel in the form of a one-stop portal.

1.7. Research Limitation

This study was conducted to propose a framework for the parliamentary democracy of the Malaysian government based on a survey from MAMPU agency. The application of the framework may not apply to other governments due to the various management structures difference.

The empirical results are drawn primarily from the experiences in Malaysia, which is the realm the researcher knows best. It is possible that the experience in other countries has been quite different. Nevertheless, given the traditions of governmental transformation in Malaysia, and the fact that the levels of organizational (including governmental) investment in IT is growing; one would expect the objectives to be strongly upheld in the Malaysian

context. The fact that it is not bears consideration. The researcher does not claim that her account is universally applicable.

To the best of the researcher's knowledge, this work is one of the first to propose an implementation framework for the Malaysian e-Government, other than the current methods adopted by MAMPU. Currently, there is not a standardized implementation framework that is followed. Each department works with their vendor to decide on the strategies and framework while complying with government standards.

1.8. Organization of the Remainder of the Research

Chapter 1 has presented the introduction, statement of the problem, research questions, significance of the study, definition of terms, and limitations of the study. Chapter 2 contains the review of related literature and research related to the problem being investigated. The methodology and procedures used to gather data for the study are presented in Chapter 3. The results of analyses and findings to emerge from the study are contained in Chapter 4. Chapter 5 contains a summary of the study and findings, conclusions drawn from the findings, a discussion, and recommendations for further study. Finally, Chapter 6 describes the design of the suggested prototype of the e-Government portal.

CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1. Introduction

In this chapter, the researcher first discusses the scope of the research and then the related works that were published by other researchers. This chapter is organized into sections that include (a) Multimedia Super Corridor, (b) e-Government case studies, (c) organizational effectiveness and operational efficiency, (d) benefits of e-Government initiative (e) e-Government maturity levels (f) challenges, (g) implementation framework, (h) open source framework for e-Government, and (i) technology for e-Government.

The literature review was conducted between April, 2004 and March, 2005 on papers aged 7 years and below. The researcher followed the search method advocated by Webster and Watson (2002) which describes a multi-stage iterative process designed to provide maximum coverage of a topic for the purposes of a narrative literature review.

The researcher also follows the example of Gallupe and Tan, (1999) in selecting literatures, where ‘high quality’ was defined as research being published in a peer-reviewed journal. The search was intentionally cross-disciplinary as it was expected prior to the search that relevant research articles fitting the inclusion criteria would be found in other research streams.

2.2. Multimedia Super Corridor (MSC) Malaysia

Conceptualized in 1996, the Multimedia Super Corridor (MSC) of Malaysia has since grown into a booming and dynamic ICT hub, hosting more than 900 multinationals, foreign-owned and home-grown Malaysian companies that are focused on multimedia and communications products, solutions, services and research and development. The MSC is an ideal growth environment for small and medium enterprise (SME) ICT businesses to transform themselves into world-class companies. The MSC Malaysia also invites other countries to use the highly advanced infrastructure facilities as a global Center of Excellence (CoE) for ICT applications and a hub for their regional operations in Asia.

Implementation of the MSC Malaysia is divided into three phases from 1996-2020:

In Phase 1 (1996-2003), the MSC Malaysia was successfully created, five Cybercities were successfully developed, with more than 1,000 companies, as well as universities, granted MSC Malaysia status; seven major MSC Malaysia flagship initiatives piloted, 22,000 high-value jobs created, and total worth of RM 6 billion in revenue generated.

In Phase 2 (2004-2010), a network of cybercities will be established in Malaysia, and a global framework of cyberlaws will be passed; furthermore at least four of five intelligent cities will be linked to other global cities worldwide. In the initial stage of MSC Malaysia National Rollout under MSC Malaysia Next Leap, MSC Malaysia Cybercity status has been awarded to Penang (in Bayan Lepas Free Industrial Zones and vicinity) and Kulim Hi-Tech Park. In the 18th MSC Malaysia Implementation Council Meeting in August 2005, chaired by the YAB Prime Minister of Malaysia, MSC Malaysia Cybercentre status was

awarded to Perak, Melaka, Pahang, Johor and Negeri Sembilan. MSC Malaysia Cybercentre status has also been awarded to KL Sentral.



(Source: <http://www.msc.com.my/msc/msc.asp>)

Figure 2.1: The three phases of MSC's Vision

In Phase 3 (2011-2020), Malaysia will evolve into a complete Multimedia Super Corridor. An International Cybercourt of Justice will be developed and established in the MSC Malaysia and all intelligent cities will be linked to the global information highway. It will be a national revolution for Malaysia towards becoming a Knowledge-based Economy and Society, as visualized in the Vision 2020.

Core areas in the MSC Malaysia have been equipped with high-capacity global telecommunications and logistics networks by the government of Malaysia. MSC Malaysia is also supported by secure cyberlaws, strategic policies; and a range of financial and non-financial incentives for investors.

Many innovative flagship applications have been developed in the MSC Malaysia to accelerate its growth. They are focused on the development of Smart Schools, Telehealth, e-Business, smart card technology, electronic government, technopreneurship.

In order to quickly realize the objectives of Vision 2020 (to transform Malaysia into knowledge-based society), a path has been defined through the seven innovative Flagship Applications. These applications are engineered to jump start the MSC Malaysia initiative and create a multimedia utopia for innovative producers and users of multimedia technology. Consortia of both local and foreign companies work with various government agencies to enhance the socio-economic development of Malaysia. The MSC offers a Malaysian initiative for the Information Age. The Flagship Applications are:

- a) Electronic Government
- b) Multipurpose Card
- c) Smart School
- d) Telehealth
- e) Research and Development Clusters
- f) Electronic Business
- g) Technopreneur Development

The e-Government initiative was launched to improve both how the government operates internally as well as how it delivers services to the people of Malaysia. The initiative seeks ways to improve the convenience, accessibility and effectiveness of interactions with citizens and businesses. Simultaneously, the effort will force other initiatives to improve information flows and processes within government to increase the efficiency and effectiveness of policy development, coordination and enforcement.

The vision of e-Government is a vision for government, businesses and community working together for the benefit of Malaysia and all of its citizens. The vision focuses on

speed and quality of services delivered from the government to the people of Malaysia, enabling the government to become more responsive to the needs of its citizens.

The seven pilot projects of the e-Government Flagship Application are as follows;

- a) Project Monitoring System (SPP II)
- b) Human Resource Management Information System (HRMIS)
- c) Generic Office Environment (GOE)
- d) Electronic Procurement (EP) (www.eperolehan.com.my)
- e) Electronic Services (E-Services) (www.eservices.com.my)
- f) Electronic Labour Exchange (ELX) (www.elx.gov.my)
- g) E-Syariah (www.esyariah.gov.my)

2.3. E-Government Case Studies

E-Governments are emerging across the globe and promises changes in the way that the public sector is delivering its services to citizens. Visions presented are argued to have very little implementation detail and over metaphorical i.e. there is a gap between the e-Government vision and the reality of what can be achieved technically. The gap between vision and reality is probably due to the fact that the vision was created mainly with a political agenda without considering the challenges that might be faced during implementation. A study conducted in April 2001 by Accenture reflected the distance between where governments wanted to be in terms of online service delivery and what they had been able to achieve since their vision statements had been announced. The study showed that some of the common challenges faced by the governments are the complexity involved in bringing the vision to life, allocating scarce resources, and determining

priorities for online service delivery while ensuring disadvantaged groups in society were not left behind by these changes.

The significant costs involved in building and maintaining the operations of an online service delivery channel must be justified by heavier benefits than just a duplicate channel for delivering the same services that are available through existing processes. E-Governments must be able to deliver tangible benefits in terms of operational efficiency and cost savings. Standardized measurement of cost and benefits of e-Government initiatives is thus necessary in order to determine its success.

In January 2002, Accenture conducted another research and found that the gap between reality and the oratory caused by political influence in the implementation of e-Governments are closing in slowly. Maturity levels were improving among the countries surveyed in terms of increased interactivity and transactional capabilities being delivered online. The most remarkable developments in this period were among those countries that were implementing e-Government with a “Think Big, Start Small, Scale Fast ” approach where first a vision is defined, then prioritization of the initiatives, in order to build momentum from the current point.

The follow up research by Accenture also showed that abstract vision statements were being replaced by clear statements of the reasons e-Government is critical to economic and social development, definition of the challenges to implementation, and clearly articulated strategies.

The study found that expectations of cost reduction in service delivery through the e-Government initiative have not been realized due to the immature nature and the lack of back office integration of most online governments. Real cost savings are only realized when there is true integration between the web front-end and the back office systems, and not just through creating an Internet presence. In order to achieve this end-to-end integration, complex changes are required in administrative structures, skills development, and business process redesign activities (Lenk and Traunmuller, 2000; Aichhlozer and Schmutzer, 2000; and Gartner, 2000).

Singapore's Government Electronic Business Centre (GeBiz) was set up in June 2000 to simplify government procurement and tender activities, and represent e-Government. As with other capital investments in Singapore, the motivation for developing GeBIZ is strategic, and moves beyond direct efficiency and cost savings. GeBIZ is meant to introduce consistency in procurement practice and greater transparency in transactions, thereby acting as a stimulus to the development of e-commerce in Singapore. With this integrated, web-based e-procurement system, suppliers and tender bidders enjoy broader access to government tenders and quotations. Public sector agencies also enjoy the benefits of making electronic purchases of commonly used items from shared period contracts (Hu, 2001).

As of September 2001, the total transaction value conducted by GeBIZ hit US\$50 million, with the number of public sector users exceeding 3,000. Tender publications have hit 3,000, valued at more than US\$1.7 billion (Chua, 2001).

In previous years, the Philippine NBI (National Bureau of Investigation) took at least three days to secure an NBI clearance; subsequently it had become the object of many complaints. An NBI clearance is required when applying for employment, passports, visas, licensure examinations, and the like. This clearance ensures that the citizen does not have a pending criminal case or existing criminal record. Thus, at any given time as many as 30,000 citizens wait in line for an NBI clearance at the NBI head office (Agatep, 2002).

Today, from an NBI kiosk located in the air-conditioned convenience of Metro Manila's shopping malls, people can renew their clearance in five minutes. The improved NBI computerization system has resulted in many benefits, including:

- a) Increase in revenue. The issuance of clearances is the NBI's largest revenue earner. Due to improved computerization, the agency earns more than P270 million a year compared to only P150 million a year when the processing of applications was slow.
- b) Reduced graft and corruption. The renewal kiosks have significantly reduced graft and corruption by reducing opportunities to bribe employees to "facilitate" the approval process or falsify documents.
- c) Expanded public service. The NBI clearance renewal kiosks can now issue more than 30,000 clearances to jobseekers and visa applicants everyday because it is efficient and more accessible to the public (based in shopping malls).
- d) Decongestion of the main NBI compound. The long line of clearance applicants in the NBI has been effectively decongested by the new NBI computerization system. The applicants' queue has been reduced to 4,000 people from 30,000 people a day. In the near future, the NBI aims to enable applicants to secure their NBI clearances from the comforts of their homes by logging in to the NBI Web site.

There were concerns about the lack of accountability and the presence of corruption in the issuing of local government licenses and permits at the highest level in the Municipal Government of Seoul. This led to the development of the OPEN system (Online Procedures Enhancement for civil applications), an anti-corruption Web portal that provides citizens with a range of relevant information, including the overall goals of the anti-corruption drive and an explanation of the rules and procedures for permit or license application and processing.

OPEN provides citizens with specific information by allowing them real time monitoring of the progress of an application for a permit or license. It also displays an anti-corruption index that summarizes survey results on process performance. Although some of this information can also be found in paper form, for the increasing number of Seoul citizens or citizens groups with Internet access, OPEN has reduced the barriers and introduced an efficient channel for obtaining government information. Citizens are therefore better informed, the process of government is more open, and the rationale for bribery has been hugely removed. Feedback from citizens has been very positive, and there has been a dramatic decrease in reported corruption. These achievements have in large part been due to the integrated approach taken, ensuring that technological change serves public sector reform goals rather than vice versa (World Bank, 2000, Heeks, 2001).

2.4. Organizational Effectiveness and Operational Efficiency

An e-Government implementation is expected to improve operational efficiency of the institutions concerned, widen public service portfolios, and increase political participation

and transparency. Citizens should be able to access a one-stop shop and perform any level of government transaction, eliminating redundancies and inconsistencies in the information bases (Deloitte Research, 2000).

In the interest of this research, the benefits of the e-Government implementation fall into two broad categories. The first category is organizational effectiveness that refers to the value delivery or usefulness of the organization when delivering services or functions to the customer. As an effective organization, the e-Government can raise the capacity of public institutions at various points of the government value chain (Deloitte Research, 2002) in terms of information, interaction with citizens and customers, and transaction, i.e. the overall handling of administrative processes.

The second category is process or operation efficiency that refers to the proficiency of a method that is used to complete a task in the shortest possible time and at the same time being spendthrift with resources to deliver the highest quality of outcome to the customer. Efficient processes allows cost savings by increasing productivity through automation of administrative routines, providing access to data and information, and simplifying administrative procedures. One example of an approach to raising operational efficiency is to lower the costs of public tendering and procurement (Thomasian, 1999) via e-procurement. The outcome of it stands out as an added value in transparency in an effective organization.

Productivity can be raised by means of process re-engineering within individual agencies or administrative units (Stone, 2001). However, inter-administrative cooperation that includes networking of workstations and definition of principals that ensure that data can be

exchanged and further processed without any drawbacks is very important (Abdul Karim, 2003). In the future, this will practically rule out any isolated decisions of individual administrations in favor of given information and communications systems. Government agencies have to see themselves as service providers in integrated systems. Otherwise efficiency gains made within individual institutions could be offset by effectiveness losses in the cooperation between administrations.

Last but not least, the aim is to increase efficiency and effectiveness through a leaner workforce. Fewer numbers of multi-skilled workers can command a higher remuneration because of higher productivity rates. This is the $\frac{1}{2} \times 2 \times 3$ formula that was invoked by Handy (1998) for the new breed of organizations where they would require half the number of people who will be paid twice as the amount they currently earn to achieve triple the amount of productivity.

2.5. Benefits of E-Government Initiative

The Working Group on e-Government in the developing world has identified five broad categories of goals commonly pursued for e-Government (Faunts, 2000).

- a) To create a better business environment
- b) To get customers online, not in line
- c) To strengthen good governance and broaden public participation
- d) To improve the productivity and efficiency of government agencies
- e) To improve the quality of life for disadvantaged communities

E-Government is a means to accomplish the broader social goals, goals that has moved beyond mere efficiency of government processes to that of overall reform and development. The goals listed above are not in any particular order of importance, as each country must determine its priorities in e-Government.

Difficult economic times have led to significant government budget overruns. State and local governments throughout the United States have had substantial budget shortfalls in the past few years and the trend is expected to continue. For fiscal year (FY) 2004, budget shortfalls for all U.S. states may extend to as much as US\$80 billion (National Governors Association winter briefing, 2003). The National Association of State Budget Officers in the Fiscal Survey of States (2002) noted, “As states fight to balance their budgets, the solutions available to them are increasingly dire, and some of the most difficult fiscal decisions have yet to be made.”

The state budget crisis seeped down to impact local governments as well. When the National League of Cities (NLC) surveyed 145 cities in April 2003, 75 percent reported they were less able to meet their financial needs than in 2002 – sharply up from the 55 percent response to that question in NLC’s 2002 survey. In the 2003 survey, 74 percent of respondents anticipated being even less able to meet their cities’ financial needs in 2004, when 54 percent expected even weaker local economies.

Improving operational efficiency and organizational effectiveness represent primary goals for many governments trying to resolve these financial pressures. However, many investment options exist – too many, that choosing among them can be an arduous task. Choosing the right option depends on knowing which initiative best meets key stakeholder

needs, accurately predicting the benefits and – perhaps most importantly – how to manage implementation to attain the desired return on investment (Kertesz, 2003).

To better understand the relationship between government initiatives and operational efficiency and organizational effectiveness benefits, IBM (International Business Machines), in cooperation with the Robert H. Smith School of Business, University of Maryland, conducted a study in October and November 2002 (Gresham and Andrulis 2002). A total of 412 U.S. public agency professionals (primarily state and local government representatives) participated in a Web-based survey and rated various initiatives on operational efficiency and organizational effectiveness. Additionally, interviews of decision-makers – representing business and technology leaders from a cross section of government departments, such as tax, social, public safety and “e-Government” supplemented the survey results. This research specifically evaluated the goals for eleven common government initiatives, overall operational efficiency and organizational effectiveness benefits from the eleven initiatives, improvements achieved for eight key success indicators for operational efficiency and organizational effectiveness and barriers and success factors from implementing the initiatives.

The study found that state and local governments are making significant investments, but their results are not fulfilling expectations often enough. With no end in sight to financial constraints, there is an ongoing need to optimize the returns on investment of every initiative. The full potential of government initiatives will not be realized until business process and cultural changes are enacted along with technology implementations. Planning for a comprehensive transformation that removes organizational, process and technology barriers may be the way to achieve more significant payoffs.

2.6. E-Government Maturity Levels

E-Government maturity measures the level of which a government has developed an online presence. It takes into account the number of services for which national governments is responsible for that are available online (Breadth of Maturity), and the level of completeness with which each service is offered (Depth of Maturity). Overall e-Government maturity is the product of Breadth of Maturity and Depth of Maturity.

Researchers break down e-Government maturity based on the stages of development that they are going through. Some stages of development that has been proposed by various researchers are listed in Figure 2.1 below.

In 2000, Deloitte Research presented the e-Government development stages in six phases. They are information publishing and dissemination, full two way transactions, multi-purpose portals, personalized portal access, clustering of common services, and full integration and enterprise transformation.

Elmagarmid and McIver (2001) later presented a simpler e-Government development model in terms of services provided and transaction types. In phase one, one way communication is provided, followed by two way communications in phase two, complex transactions in phase three and finally government administration integration in the fourth phase.

Source	Deloitte Research (2000)	Elmagarmid & McIver (2001)	Layne & Lee (2001)	Watson & Mundy (2001)	UN/ASP (2001)
Phase 1	Information Publishing / Dissemination	1-way communication	Catalogue	Initiation	Broadcasting
Phase 2	Official 2-way transactions	2-way communication	Transactional	Infusion	Interaction
Phase 3	Multi-purpose portals	Complex transactions	Vertical integration	Customization	Transaction
Phase 4	Portal personalization	Integration across government administration	Horizontal Integration	-	Integration
Phase 5	Clustering of common services	-	-	-	-
Phase 6	Full integration and enterprise transformation	-	-	-	-

Figure 2.1: E-Government development stages

Also in 2001, Layne and Lee researched on a development model based on integration. In its first phase, e-Governments are capable of cataloging information. Transactions capabilities are present in the second phase. The final two phases are vertical and horizontal integration.

Watson and Mundy (2001) proposed a generic development model that has three phases. They are initiation, infusion, and customization. Finally, according to UN/ASP (2001), the e-Government goes through four phases in its lifecycle. They are the broadcasting, interaction, transaction and integration phase.

2.7. Challenges

E-Government implementation, like any other government infrastructure projects, is done in phases and the costs of implementation will depend on current infrastructure availability, supplier and user capabilities, and mode of service delivery (whether through the Internet or through telephone hotlines and one-stop shops). The more complicated and sophisticated the kind of services the government wants to offer, the more expensive the cost is.

Small, self-financing or outsourced projects should be the focus of Governments. E-Government projects must be financially sustainable, thus there must be a revenue-over-cost-reduction model in place from the initial stage. The most likely projects to be sustainable over the long term are smaller projects with minimal initial investment and a clear revenue-generation strategy. Web sites are one of the easiest and cheapest ways to achieve high impact e-Government with a minimum of investment.

However more often than not, e-Government projects are long-term endeavors, requiring large capital infusion in software, hardware, infrastructure and training. A practical financing plan should not only pay for the immediate needs to jumpstart e-Government, but also must consider long-term financing options for the sustainability of the project.

There are various business models for funding e-Government projects, and the private sector plays a critical role in these (Reason Foundation, 1997). The first one is a partnership arrangement. Under this model, the private sector builds finances and operates public infrastructure such as roads and airports, and recover costs through user charges. Various financing schemes exists in this model varying from soft and development assistance loans

through donor or multilateral aid agencies to partnerships and outsourcing deals with private third party vendors under special financing schemes for instance the Build-Operate-Transfer (BOT) scheme that can minimize the initial cost to government.

BOT and its variants (BOO, Build-Own-Operate and BTO, Build-Transfer-Operate) are usually the favored financing models for government projects that require large and immediate financing from the private sector. The private sector designs, finances, builds, and operates the facility over the life of the contract under BOT. At the end of this period, ownership reverts to the government. A variation of this is the BTO model, under which title transfers to the government when construction is completed. Finally, with BOO arrangements the private sector retains permanent ownership and operates the facility on contract (Reason Foundation, 1997).

Cooperation with the private sector can facilitate effective e-Government rather than competition. Rather than duplicating them, government can encourage private sector investment by complementing and supporting private sector efforts. The key objective for e-Government initiatives is to improve citizen access to service delivery and not to further expand the role of government. Where public-private partnerships or private service providers can adequately provide these products and services more efficiently and effectively, government should not attempt to create products and services (Software and Information Industry Association, 2001).

An RM270 million secure electronic marketplace and e-procurement service called e-Perolehan is being built to enable the government of Malaysia to purchase goods and services over the Internet. Launched in July 1999, this service enables end-to-end

transactions from direct purchase to request for tender and request for quotation to awarding of bids. Involving 4,288 government purchasing centers, 35,000 suppliers and roughly 350,000 products, the project is to be completed in three phases over a period of 8 years, with development and nationwide roll-out within 34 months.

E-Perolehan is financed through a BOT scheme involving Commerce Dot Com Sdn. Bhd. (CDC), which is an electronic commerce joint venture company between Puncak Semangat Sdn. Bhd. and NTT Data Corporation. CDC will undertake the total financing of the project in exchange for exclusive service operator rights to the Malaysian supplier community. Suppliers can host their products and prices online free of charge thus reducing their overhead costs. Besides, the government benefits also from a more streamlined procurement process. Other government agencies throughout the country will be able to access the pricing information online once it is completed. When a sale transpires, a minimum e-Perolehan transaction fee of 0.8%, and a maximum of RM9,600 will be charged. Through e-Perolehan, transaction costs are reduced from RM950 per transaction to an average of RM64.60. CDC estimates that the return on investment (ROI) will be around 15 percent to 20 percent annually. It also expects to recover its investments in the third year of operation, with a revenue of RM 50-100 million annually. (Tradeport, 2001).

Additionally, to encourage SME development and increase competition, in 2001 the Malaysian Government installed a network of telecenters nationwide to enable smaller-sized suppliers to trade online with all government procurement centers. The centers, are located in all state and district capitals and will provide help to non-IT savvy suppliers perform online transactions such as submitting registration applications, providing catalog

details or even getting connected to the Internet. Suppliers will save up to 50% in registration costs by using the system (Hor, 2001).

A citizen-centered approach must be the consideration as a foundation for any e-Government policy. This means that e-Government should be an end-user or demand-driven service. However, for several reasons like unfamiliarity with ICT, lack of access, lack of training, and concerns about privacy and security of information causes many citizens not to use e-Government. As long as these concerns are not addressed, citizens will not be prompted by the ease and convenience in the delivery of public services and the innovative offerings of government services in e-Government.

Singapore's eCitizen portal marked improvement from 200,000 hits a month when it was first launched in 1999 to an average of 3.1 million hits a month. This developed country of 4 million citizens exponentially expanded their online public usage in less than three years' time. Singapore established a network of eCitizen Help Centers since November 2001 to ensure ubiquitous access to government e-services. These centers are equipped with Internet kiosks that give free access to the Internet for citizens. For those who are not proficient with the Internet, there are helpers to assist. There are 24 eCitizen Help Centers strategically located near Community Development Councils (which function as a specific district's local administration handling community programs and social assistance services delegated from the ministries) and Community Centers (community clubs that organize cultural, educational and social or recreational activities to promote racial harmony and social cohesion) currently (Iwanaga, 2000).

Security and protection of privacy is important in e-Government. Security generally refers to the protection of information system assets and control of access to information. Security policies and strategies are both context-specific and information-specific.

Privacy refers to the right for information attributed to an individual (also called “nominal information”) to be treated with an appropriate level of protection. To regulate privacy, Information privacy protection laws are often put in place. The key to user trust is protecting the privacy of citizens and assuring them that their personal information will not be compromised is critical in e-Government. No one will be prompted to use e-Government services without this assurance (Nwaerandu et al, 1987).

Despite complaints about the system from privacy advocates and refusal to participate by some municipalities, local governments across Japan have begun feeding basic information on their citizens into a central database as part of a new resident registration network. Everybody who lives in Japan is issued an 11-digit identification number that can be used in many dealings with local government under the new system. This replaces a system under which people had to produce resident certificates to prove where they lived each time they dealt with local government and which required people to go through time-consuming procedures each time they moved.

A centrally-run government server stores each person’s file that contains information such as the person’s name, date of birth, sex and address. Under the name Jumin Kihon Daicho Network, or Juki-Net for short, the system aims to make life easier for both citizens and local municipalities. City halls all over Japan will have access to the database, making

dealing with the government as simple as turning up with your ID number. However, this ease of access is ringing alarm bells across Japan.

The government promised that new data privacy and protection legislation would be in place by the time the system went into operation when the Juki-Net idea was first floated in 1999. However, some of the bills associated with this are still in the Diet, Japan's parliament. Many argue that the system should not be launched until these laws are in place. Others contend that the numbering of each individual is the problem with this system. Fearing that the privacy of their citizens may be at risk, some local municipalities are refusing to connect to the system.

The reaction from privacy advocates is perhaps expected but the refusal of some cities to join Juki-Net has come as an embarrassment to the government, which sees the system as a key part of its E-Japan scheme. E-Japan is an ambitious program that aims to make Japan the world's most advanced IT nation by 2005. A centralized database of people living in Japan would be essential to achieve one of its key goals which is the online delivery of many government services.

The use of the identification numbers by anyone apart from the bureaucracy and imposed duties on civil servants to keep information confidential and prevent information leakage to outside sources are parts of the proposed law.

2.8. Implementation Framework

In order to chart a successful implementation of the e-Government initiative, researchers have come up with many development models. Many researchers (Deloitte Research, 2000, Elmagarmid and McIver, 2001, Layne and Lee, 2001 and Watson and Mundy, 2001) have developed stage-based approaches that consist of discrete phases of development.

In order to facilitate the implementation of e-Government generally, academics and practitioners have developed frameworks based on the relationship of e-Government stakeholders. The concept of building a framework based on the relationship of transactions has been argued of being rhetoric in nature.

Implementation framework in the sense of this research is the outline of stages that serves a guideline towards the execution of a planned system. A huge and complex system such as the e-Government cannot be implemented in a copycat fashion because of the nature of the underlying government and its principles that varies from nation to nation. Lenk and Traummuller (2000) proposed that a robust framework for e-Government can be built by analyzing issues from the perspectives of knowledge management, process reengineering and integration between various agencies and trading partners.

A network that connects all government agencies is needed to ensure that citizens enjoy the full benefits of e-Government, from the point of view of the e-Government infrastructure. Building this network requires planning across all public agencies and government and is a very expensive undertaking. Many factors must be considered when building such a government backbone. First to study the cost implications, a financial feasibility study is

necessary. This cost-benefit analysis can help government decide either to open fractions of the government backbone and charge access fees to telecommunications carriers or operators to sustain operations, or to altogether ride on an existing private network due to cost constraints.

There are some issues to be considered when building the infrastructure framework. The infrastructure issues, that include the country's existing infrastructure, current level of Internet penetration, telephone density, existing speed of technology change, allowances for convergence, and investment in broadband.

The benefits and risks of having one's own backbone that ensures government communications are open and secure and operating 24 hours a day, 7 days a week and 365 days a year. However to support the network full time, this may mean regular funding for upgrades and maintenance of the network, and for hiring a team. Some governments may decide that it is too costly and too time-consuming to build their own backbone. If governments want to immediately engage in e-Government, there may not be enough time or money to do so. Building a backbone may take years and billions of dollars to complete.

An existing private telecommunications backbone that is run by a large telecommunications carrier can be an alternative to ride on. This means that the security of the network will be handed over to the operator, who will also be assuming the costs of technical support, regular network maintenance and the risks of possible network sabotage. Governments who are riding on a private backbone will have to set up the following types of security measures: firewalls, intrusion detection software, encryption, and secure networks (such as Virtual Private Networks, Wide Area Networks or Local Area Networks)

for government agencies that require high levels of security, such as the armed forces, in order to minimize the danger of security risks,.

In South Korea, the New Korea Net-Government (NKN-G) was constructed to improve the efficiency of government operations and delivery of public services. It connects central and local governments, public institutions, research organizations and universities through optical fibers. The NKN-G was developed within the larger framework of the Korea National Information Infrastructure (NII), which was prompted in 1992 by the government's fear that unless an information infrastructure was built, its basic industries would not be able to compete in the global marketplace. It will be completed in 2015 (Jeong, King, 1996). The NII with the NKN-G allowing for simple and swift delivery of public services in support of the national government's goal of transparent, accountable, and efficient government was seen as part and parcel of Korea's national economic policy.

The construction of the NII involved not only communications services, but also Internet services, application software, computers and operating systems, as well as information products and services. Korean citizens are able to access information and services and transact business 24 hours a day, 7 days a week through the NII.

The researcher takes into account the initiatives of the Malaysian e-Government and future plans and uses it to set up an implementation framework that can be adopted by similar government agencies. Best practices learned and gathered by other governments serves as an excellent guideline in developing the elements that construct the framework. The framework also takes into account the maturity level of the current Malaysian e-

Government, because different maturity levels needs a different focus in implementation action plans.

2.9. Technology for e-Government

Although e-Government is often defined as online government or Internet-based government, many non-Internet based e-Government technologies can be named in this context, including telephone, fax, personal digital assistants (PDA), short messaging service (SMS), multimedia messaging service (MMS), and third-generation technology (3G), general packet radio service (GPRS), WiFi, Worldwide Interoperability for Microwave Access (WiMAX) and Bluetooth. Other technologies can include closed-circuit television (CCTV), tracking systems, radio-frequency identification (RFID), biometric identification, road traffic management and regulatory enforcement, identity cards, smart cards and other near field communication applications, polling station technology (for non-online e-voting), television and radio-based delivery of government services, email, online community facilities, newsgroups and electronic mailing lists, online chat, and instant messaging technologies.

Government has evolved from the conventional government to e-Government and now m-Government (mobile government), u-government (ubiquitous government), and g-Government (GIS/GPS applications).

M-government is the next inevitable direction for e-Government practices because spread and success of mobile or wireless applications and services all around the world provides

an opportunity for governments to exploit these new developments and enhance e-Government implementations. M-government can be seen as a subset of e-Government in the context that m-Government is the use of mobile and/or wireless ICT technologies like cellular or mobile phones, and laptops and PDAs connected to WLANs. M-government can help make public information and government services available anytime, anywhere to citizens and officials (Lallana, 2004).

U-government on the other hand, reflects new forms of interaction and transaction that are possible anywhere and at any time on various devices due to the pervasive availability of networks, applications and services. U-government is based on the mobility in telecommunication and innateness in computing. Ubiquitous services can become available with the availability of mobile phones, DMB (digital multimedia broadcasting), BcN (Broadband Convergence Network) which allows convergence of wireless and wired networks, and IPv6 which enables provision of infinite Internet addresses. RFID makes available any service to anyone at any time in any place possible by embedding electronic chips into moving objects including humans as well as fixed environments. In short, the ubiquitous environment has features like disappearing networks, invisible computers and pervasive services (Hae, 2006).

To fully capitalize on data existing in legacy systems, governments can leverage the strong data integration abilities of GIS. Initially, government Web sites delivered little more than phone numbers and mission statements. Phone numbers given to public that are only answered between 8 a.m. and 5 p.m. really does not improve service. GIS has helped government web sites become a tool for collaboration, communication, and service. GIS-enabled Web sites can provide services like online booking, fee payment, and application

submission that were not previously available. There are three major types of g-Government applications that can be offered via the robust GIS and data infrastructure foundation which is G2B, G2C and G2G. G2B applications normally relate to economic development, land development, licensing, or permitting. G2C applications provide information on government services such as streamlining the public's interaction with government agencies by allowing online payment of fees or providing feedback to officials. G2G applications improve the amount, quality, and speed of information exchange between various levels of government and agencies and departments within governments. Governments use resources more wisely through better communication by avoiding duplication of effort and allows agencies to work together to tackle large-scale problems or respond to emergencies.

Other aspects of technology to be considered in the implementation of e-Government are e-enablement, interoperability such as the e-Government interoperability framework (e-GIF) and semantic web issues, legacy technology, and implications for software choices (open source or proprietary software, and suitable programming languages).

2.10. Open Source Framework for e-Government

“Open source” software is typically developed by programmers by distributing source code modifications freely over the Internet, such as the Linux operating system. There are two critical characteristics that define open source software. First, users are given access to the source code, which allows them to modify study or augment the software’s functionality. Second, any licensing agreement allows distribution of the initial software and

redistribution of that software in a modified form. Users may submit changes to the community of developers for possible inclusion in future versions, if they make changes to the software (Trimble, 2000).

Open source software present several advantages for e-Government systems. When compared to their more expensive commercial counterparts the capabilities of open source software are comparable, and in some cases superior. Open source software is highly attractive by comparison of reduced licensing fees and lower hardware costs.

Regardless of whether they are using propriety platforms or open source software, open source solutions ensure interoperability and access to all users, allowing for smooth interdepartmental integration. Indeed, proprietary software will support integration with outside products and support global standards if it wants to attract and retain customers.

Open source software is as secure as proprietary systems if properly configured. In fact, some users argue that systems integrating software from different sources, such as Linux are less vulnerable to attack compared to systems built on software coming from a single vendor. This is attributed to the fact that open source software is the work of programmers worldwide, both paid and voluntary, which collaborate through the Internet, contributing working software code which is reviewed by their peers. This diversity makes it largely impermeable to viruses in contrast to closed source software. Its openness also guarantees that open source software has been thoroughly inspected for security vulnerabilities.

Part of a government's strategy to cut down on piracy can be to move to open source software. It is perfectly acceptable to purchase a single copy of software and install it on

any number of machines, or simply download it for free off the Internet under most of the recognized open source software licenses.

There are also risks involved in the use of open source software. The first risk is that installation of products not suitable for user needs could be a result of a preference for open source. Secondly, open source may actually cost more than proprietary software when government factors in the cost of finding support technicians and developing additional functionality in software applications. Concerns with copyright and patents, liability, security and quality are some of the other risks associated with the use of open source software. By assigning specific rights, defining legal limits, and providing a named commercial entity that theoretically stands behind the code create a sense of safety for commercial or proprietary software compared to open source (Murphy, 2002)

Governments around the world work with different e-Government budgets. The Brazilian government spent a mere US\$200 million in 2000 while Europe spent US\$7.8 billion for local, state and federal governments in the same year. Most developing nations may not be able to afford the cost of proprietary software and thus free or low-priced software hold a powerful appeal (Festa, 2001).

Some countries like Germany, France, the United Kingdom, Italy, Spain, China, Singapore, Australia and Brazil have explicit policies on the use of open source software, while others are in the process of proposing legislation to this effect.

The European Commission's Working Group on Libre Software recommends the open source route for all government-funded software research and development among its

member countries in its released policy document entitled “Free Software/Open Source: Information Society Opportunities for Europe” (<http://eu.conecta.it/paper/#foot16>). Published in July 2002 by the Office of Government Commerce (OGC), the final draft of the U.K. government’s policy on open-source software, says that in all future IT developments where interoperability is an issue, it will use only products that support open standards and specifications (Loney, 2002).

In order to guarantee full interoperability, in November 2001 the Committee for e-Government of France announced that the French Agency for e-Government (ATICA) would be in charge of selecting open standards to be enforced all over public administrations (Eurolinux Alliance, 2001).

In 2002, the German government announced that it has moved to standardize using Linux and an open source model at the federal, state and communal levels. This decision was made with three key objectives: avoiding monocultures to raise the level of IT security, lower dependency on single software vendors, and increase cost savings in software and operating costs (Galli, 2002).

In an attempt to avoid reliance on U.S. companies particularly Microsoft, the Chinese government has moved to install the open source Linux operating system provided by Red Flag (Liu, 2002).

2.11. Summary

The literature study conducted revealed that researchers across the globe are studying the effects of e-Government towards the citizens. Thus, it can be said that a citizen-centric model is the starting point of consideration for an e-Government framework.

Benefits achieved in terms of organization efficiency and operational effectiveness that was highlighted earlier has been strengthened by the literatures analyzed here. Moreover, e-Government implementation is also expected to widen public services portfolios and increase transparency in processes along political lines hitherto reducing bureaucracy or red tape.

Emerging e-Governments are realizing that there is a gap between the vision and reality of the initiatives because political agenda was the driving force of it. Key stakeholder needs and challenges that needs to be overcome has to be the main agenda that is driving the implementation instead of political visions alone.

As a result of poor integration planning and inadequate standards, cost reduction, which is deemed the definite benefit, is not achieved. Barriers such as processes, organizational and technological that hinders smooth implementation of the e-Government calls for more drastic measures such as organizational reengineering and not a measly web presence alone.

Researches on the implementation framework of e-Government in terms of infrastructure and functional were highlighted in this chapter. The models of evolution of e-Government

from web presence to highly matured and dynamic e-Governments were researched by various researchers.

Various emerging ICT technologies are enabling the progress of public administration from conventional government to electronic government and in the future, ubiquitous government. Out of the various technologies available, the researcher drills down further into works that had been done on open source technology selection for e-Government.

CHAPTER 3: METHODOLOGY

3.1. Introduction

This chapter addresses the methodology, procedures and instruments that will be used by the researcher to gather data and analyze them. The researcher also describes the method that will be used to select samples and the data collection instruments that was used. The design of the research is described in detail in the last two sections of this chapter.

The researcher aims to examine the benefit achievement of the government initiative through a survey. The study investigates manners in which the government can provide a more efficient and effective customer-centric service and the extent of the e-Government implementation in Malaysia. The researcher also looks for challenges that were encountered during the implementation of e-Government initiatives. The study is projected to develop an e-Government implementation framework and place Malaysia in a standing among peer countries.

3.2. Theoretical Framework

The researcher approached the research questions presented earlier in terms of operational effectiveness and process efficiency as brought about by other researchers that are discussed in this chapter.

In order to explain the scope of the e-Government implementation that is implied in this thesis, the researcher presents the theoretical framework in four sections. The first section

shows that the Public Agency Professional Survey will be used to gather the benefits experienced by departments that are currently involved in the e-Government initiatives. Next section shows that the researcher will conduct interviews to special target groups of government executives to extract the challenges that are currently faced in terms of organization, process and technology. The third section aims to collect evidence of the e-Government progress in Malaysia as compared to peer countries such as Mexico, Taiwan and Germany. Finally, the analysis and findings will be used to draw a conclusion for the proposed e-Government implementation framework.

The Figure 2.1 below describes the breakdown of activities for e-Government implementation that constitutes the scope of this research.

E-Government implementation framework needs to have the characteristics that would enable it to improve current business processes and tie up loose ends that exist in current processes. To achieve the desired customer-centric effective e-Government, there are three main phases that an e-Government is expected to go through.

The first phase would be to sort out the tangles in current processes by automating processes, consolidating the infrastructure, rationalize resource usage and restructure the existing organizational model into a more federalized one.

The second phase points to creating a reliable infrastructure by adopting industry standard security policies and setting up a business continuity and recovery facility.

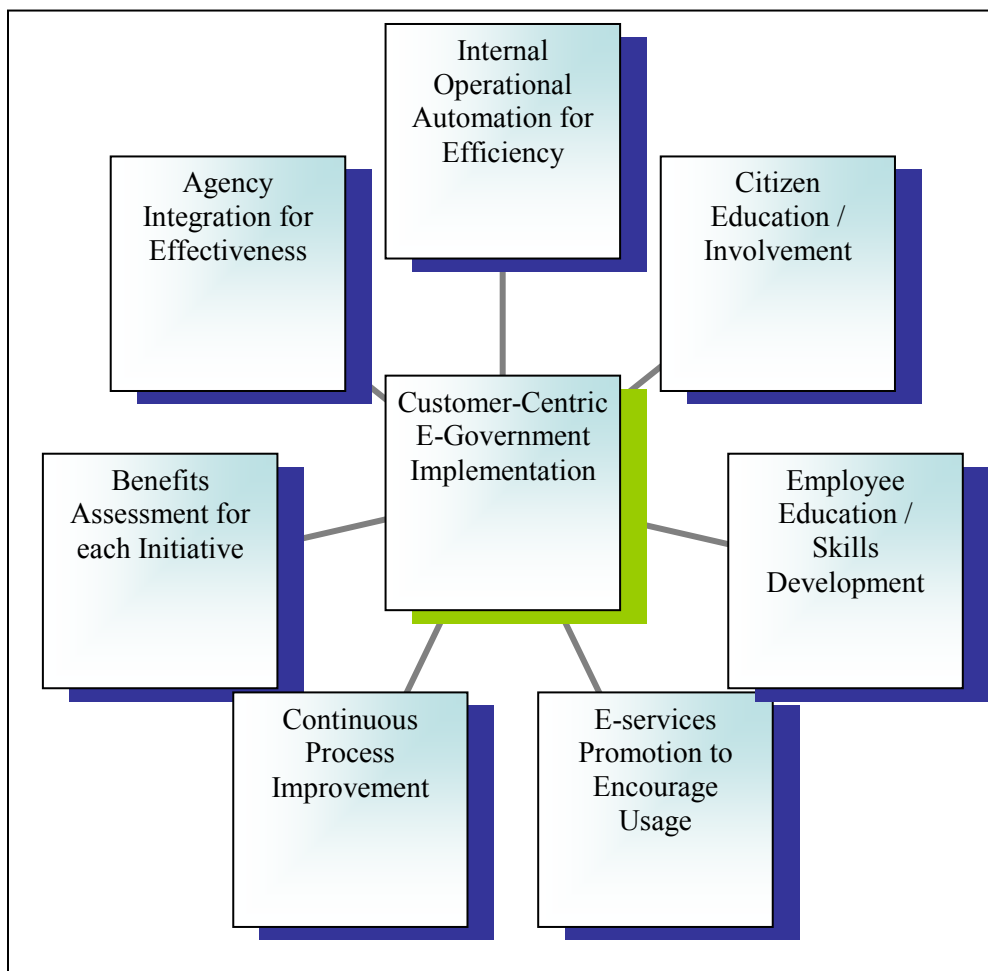


Figure 3.1: Scope of e-Government implementation

The final phase that is expected to bring an e-Government to a high level of maturity is electronic enablement of the government by ensuring information and knowledge management via data warehousing and reporting tools, application integration via standardized tools and customer centric systems via customer relationship management (CRM). Other significant programs such as education and promotion of the e-Government services have to be in place in order to prepare citizens and employees for changes.

Above all, efficiency and effectiveness of e-Government has to be measured in order to track the progress that is being made. Through the benefits management program, continuous improvement is expected. The theoretical framework can be depicted as input and output in Figure 3.1 below.

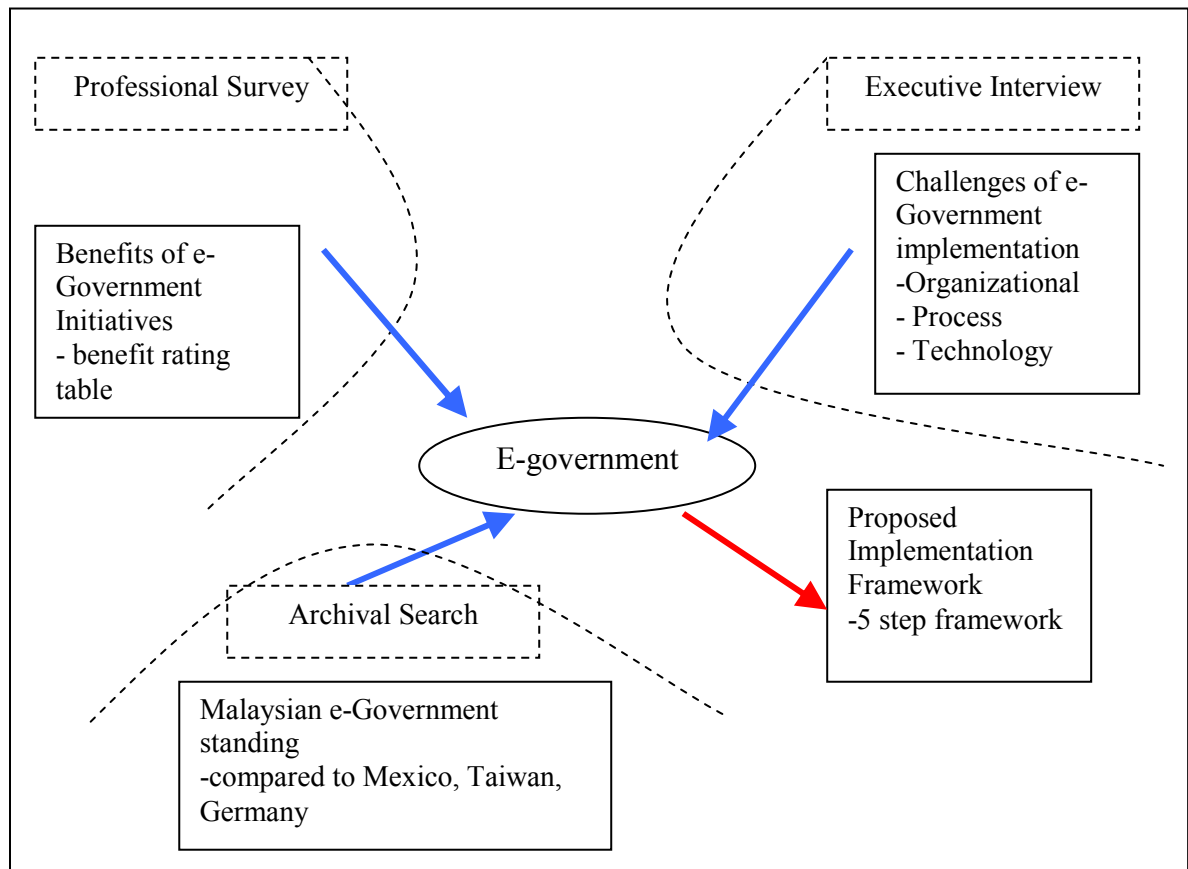


Figure 3.2: Expected input and output of this research

The researcher will use the survey method in order to gather quantitative data via questionnaires to describe the characteristics of the Malaysian e-Government initiatives and, the benefits deemed achievable. The findings are expected to contribute towards prioritization of initiatives and strategies and the development of the implementation framework. Next, the researcher plans to administer questions during face-to-face and

telephone interviews with public agency executives to support the quantitative data that will be collected and direct the questions towards the challenges faced during the implementation and some of the mitigation actions.

3.3. Public Agency Professional Sample Selection

All public agency professionals working for the government in Malaysia would have been the perfect population. However, because of different party leadership, legal requirements, geographical distance and different initiatives, though, such a generalization might not be justifiable within the research timeframe and budget. One that is considered justifiable by the researcher is to target the population of all government employees in Kuala Lumpur and Selangor areas who are in the lower level executive roles.

A total of 30 percent Malaysian public sector public agency professionals at the state, local and federal level will be targeted to participate in the questionnaire-based survey regarding the operational efficiency that they encountered after the implementation of e-Government initiatives. These responses will be supplemented with interviews of government decision-makers. This survey will be carried out via questionnaires that were distributed and recollected between March and May 2005, under the management of University Malaya.

Some of the public service sectors that will be researched are defense; education; human resource services; immigration, justice and security; postal; procurement; regulation; procurement; revenue and customs; and transport. The public services agencies that will be surveyed are representative of what citizens and businesses require from their government

most frequently. These services are traditionally offered over the counter, by phone in paper format.

The findings will be experienced based, rather than rhetoric-driven because this survey concentrated on four areas:

- Initiatives that government agencies have invested in over the past two years.
- Goals for the government initiatives.
- Overall impact of government initiatives on operational efficiency and organizational effectiveness.
- Prioritization of the initiatives that is expected to aid in the development of an implementation framework.

3.4. Public Agency Executive Sample Selection

An ideal sample for the public agency executive interview would be to identify all government agencies and departments in Malaysia and to select sample agencies using random numbers. As this would require excessive amount of time, this sampling had to be modified by taking a random sample of government departments in Kuala Lumpur and Selangor, identifying all agencies in these departments only, then taking a random sample of executives level personnel from public agencies and MAMPU. The target population is organizational decision-makers i.e. government IT decision-makers and officials from MAMPU.

Samples for this research will be drawn based on their involvement in the e-Government and MSC initiatives using the two-stage sampling method described earlier. The sample

can be said to be ecologically generalizable because, they will be taken from the metropolitan state of Kuala Lumpur of the federal territory and the state of Selangor where the federal, state and local governments are present. These samples are also conveniently accessible by the researcher.

10 percent of the Malaysian government agencies are expected to be researched. The research will focus on customer-facing agencies in areas such as welfare, immigration, revenue, licensing and employment. Interviews will be conducted with senior executives from government departments —either with an overarching responsibility for the strategic objectives of the organization (such as the CEO, CIO, COO or c-level equivalent) or with specific responsibility for customer service initiatives within the organization, such as customer service directors or program managers.

3.5. Instrumentation

A multi-method approach that combines qualitative and quantitative data will be used to produce triangulation and constructs (Jick, 1979). This method is used because data collection from various sources increases the trustworthiness and validity of data (Todd 1979; Yin 2003; Saunders et al 2003).

The instrumentation that will be used on the research questions is a survey of the public agency professionals via questionnaires. Public agency executives who are key decision makers of the e-Government initiative will be interviewed via telephone and where possible, via face-to-face meetings.

For both sets of sample, the instrumentation is expected to gather information about the level of the public agency researched in the government. Local level agencies are agencies like the Selangor Land Office and Selangor Treasury, state level agency includes the Selangor State Ministry and federal level agencies are the Prime Minister's Department and the Education Ministry. The types of public services provided by the government agencies were grouped into customer-facing (i.e. Department of Immigration) and non customer-facing (i.e. Survey and Mapping Department). Another key demographic information is the respondents role, whether IT or business-related. This important information is required in order to be able to identify the angle of opinion provided by the respondents.

The instrument administered for the first research question is expected to indicate key success areas and its relationship with providing efficient and effective public services. The questionnaire is used to gather empirical data about benefits from operational efficiency and organizational effectiveness. It is also expected to indicate where Malaysian government stands compared to the rest of the world in terms of the 11 common initiatives which is the aim of the third research question. These two objectives compose the public agency professionals' survey.

The research would not be complete if the barriers of e-Government implementation were not known. Thus, the second research question brings us back to the grounds of reality where challenges faced by the government in implementing the initiative will be dug up via the public agency executive interview. Further interview questions were designed to gather data about how these difficulties are dealt with currently.

3.5.1. Validity of Instructional Material

The study will use 11 common initiatives that was adapted from the University of Maryland research (Gresham and Andrulis, 2002) to rank the benefits achieved:

1. IT infrastructure or enterprise architecture

IT infrastructure or enterprise architecture consists of physical technology components, such as hardware, software, data and network, chosen and assembled in a manner that best suits the business strategy, as well as the overall configuration and management of those components.

2. e-Workplace or Intranets

e-Workplace or Intranet solutions are the tools and services that enable employees to access data and use services to improve their productivity.

3. Strategic planning

Strategic planning sets the business and technology direction for an organization by establishing the vision, mission, goals and objectives based on key stakeholder goals and customer wants and needs.

4. Strategic outsourcing

Strategic outsourcing is the management of government applications, IT systems and/or business processes by third parties (external to government).

5. Business case analysis

Business case analysis (BCA) is a structured and systematic methodology for analyzing the alternatives involved in a business decision. The BCA considers such elements as process redesign, technology solutions, resources needed, funding and partnership options.

6. Case Management

Case management includes the collaborative processes which are used to assess, plan, implement, coordinate, monitor and evaluate the options and services required to meet an organization's needs – using communication and available resources to promote quality, cost-effective outcomes.

7. Website or Portal

Portal is a single point of access to all of the services provided by the local, regional or national governing body, allowing online interaction with its constituents – including associated Internet applications – to improve service delivery.

8. Business process or organization change (without technology)

Business process or organization change refers to the activities required to transform or reengineer business process. Organization change efforts help enterprises to identify barriers to changes and build capabilities and commitments to promote successful transformation.

9. Enterprise resource planning (ERP)

Enterprise resource planning (ERP) streamlines business processes that cut across the functional areas of the business by applying commercial off-the-shelf application suites.

10. Customer relationship management (CRM)

Customer relationship management (CRM) is a set of management activities and processes used to identify, select, acquire, develop, retain and better serve customers. CRM encompasses a coordinated set of activities revolving around the customer.

11. e-Learning

e-Learning is the use of Internet technologies to deliver a broad array of education and training that enhance employee knowledge and performance. e-Learning represents various electronic education methods.

In order to determine the underlying benefits for operational efficiency and organizational effectiveness, the 11 initiatives listed above will be evaluated against 8 criteria also used by the same study.

1. Improved distribution of information and communication.
2. Provided more efficient/effective customer service
3. Improved services delivery/cycle time
4. Analyze information to improve decision-making
5. Improved employee cross-functional skills
6. Improved employee productivity
7. Reduced costs of providing services
8. Reduced operational expenses

3.5.2. Reliability of Data Collected

Two types of error can occur in sample-based surveys: sampling error and non-sampling error. Sampling error arises because in a sample survey not all of the population is surveyed. Hence a measured sample statistic is not usually identical with the true population behavior. Non-sampling errors cause bias in statistical results and can occur at any stage of a survey and can also occur with censuses (i.e. when every member of the target population is included). Sampling error can be estimated mathematically whereas estimating non-sampling error can be difficult.

On addressing the non-sampling error, the survey response rate excludes responses that were received but are insufficiently complete to provide input into the data generated. However, a response rate of more than 50 percent is considered very creditable for a voluntary survey.

Every effort will be made to reduce the non-sampling errors to a minimum by careful survey design and efficient operating procedures. In particular, the paper survey design minimized the possibility of errors made in recording and coding of responses, as the respondents will only have to choose from a number of choices when responding to the survey. Whenever the respondents are given subjective questions, a clear guideline will be given to guide the response within the scope of the survey.

In addition, identifiable errors made by respondents while completing the survey will be removed from the results. For example, blank responses will be generally coded to non-response categories.

3.6. Instructional Material

The first set of instructional material consists of survey questions, in the form of ratings on a Likert scale, directed to public agency professionals who are directly involved in the e-Government implementation (especially MAMPU). The questionnaire tries to highlight top initiatives and rate the benefits achieved from the e-Government initiatives implemented. A list of the suggested questions can be found in Appendix A. Majority of the questions is guided by key selection points to ensure that responses collected are within the scope of this research.

The second set of instructional material consists of questions in the form of multiple choice answers directed to key decision makers in public agencies. This material is expected to gather empirical data regarding common barriers in e-Government implementation in Malaysia that mainly falls into three categories, namely organizational, process and technological. A list of the questionnaire administered can be found in Appendix B.

Scales will be included in any question that required a respondent to measure the strength or level of a theoretical construct. In its simplest form in the survey, a scale asked a respondent to rate the level of benefit or effectiveness of various implementation variables on a five-point scale.

The scales that will be used in the surveys will be generally balanced - that is, they allowed the respondents to express one of the two extremes of view (e.g. limited and significant).

These scales are also designed with a midpoint that allowed respondents to enter a ‘moderately beneficial’ response. When interpreting scales it is important to realize that there is not an ordinal relationship between points in a scale. That is, the strength of opinion to shift a respondent from ‘moderately beneficial’ to ‘limited’ may be much smaller than the strength required for shifting a respondent to ‘significant’.

3.7. Research Design

The survey method was used in this research because it has the lowest comparative cost compared to other methods of quantitative data collection methods.

The population of the public agency professionals’ survey is the 350 government agencies including the ministries and MAMPU who are involved in the e-Government initiative or the MSC flagship. The agencies will be sent the survey in March 2005 for completion. This survey will be a paper survey rather than an online survey. The survey design may be used to develop a longitudinal data set to facilitate trend analysis of similar issues in the future.

The public agency executive interview will be designed to establish the views of government decision-makers on the challenges that are currently faced in implementing e-Government initiatives.

The results of the public agency professionals’ survey will be one of the main sources of information on which the researcher will be drawing on when preparing of the finding. The public agency executive interview is also designed to complement the public agency

professionals' survey. The results of the public agency survey are, in part, intended to act as a 'reality check' in analyzing responses to the public agency professionals' survey.

Additional questions, suitable for agency executives but not for public agency professionals (such as on challenges faced), was included in the public agency executive interview.

Countries like Mexico, Taiwan and Germany were chosen for comparing the e-Government initiative status in Malaysia. The reason why of these three countries are chosen can be seen from economic, population size and geographical size respectively. Both Mexico and Malaysia has an economic similitude and are seen as the "tigers of the east". The Gross Domestic Product Per Capita, for Malaysia is \$ 10,400 whereas the same indicator for Mexico is \$ 254.2 billion based on a 2005 estimate compiled by the World Factbook. Taiwan has an estimated population of 22.7 million which is equivalent to Malaysia that has an estimated total population of 26.1 million around mid 2005 (World Population Datasheet, 2005). Finally, the geographical size of Malaysia is 127,317 sq miles and Germany is 137,830 sq miles (World Population Datasheet, 2005), thus presenting a land area resemblance.

3.8. Procedures

The questionnaire instruments that are directed to the public agency executive and public agency professionals' survey sample will be administered via mail on the second week of March 2005. Samples will be given four weeks to complete and submit their response. As part of their survey return, public agency professionals will be required to 'sign off' their

response to ensure validity of the data collected. Data collected will be disposed appropriately to maintain respondents' anonymity.

This research also will consist of a series of in-depth telephone interviews with senior executives at a selection of target government agencies across state, local and federal jurisdictions that will be carried out in the same month to support the questionnaire results. However, interview slots have to be pre-booked and therefore it is dependent on the interviewee's available time.

3.9. Data Analysis

In this survey, with non-anonymous responses, it will be possible to identify the non-respondents. This will benefit the ability to follow-up non-respondents. For analysis presented in this report it is assumed that there will be no significant bias between those who responded in the survey and those who did not respond.

The results are calculated under the assumption that responding persons answer in the same way as non-respondents. This will be considered when using the data to make inferences about the government agency population.

Note that results will generally be presented rounded to the nearest whole percentage point (i.e. 42 percent not 41.8 percent). Due to this rounding, the percentage results for some questions may not add up to exactly 100 percent.

Data collected that are for from the public agency professional survey will be analyzed in the following areas:

- A response to research question one, regarding the relationship between government initiatives and the benefits on operational efficiency and organizational effectiveness, will be generated by computing means and frequency for each survey item.
- The challenges when implementing the initiatives will be categorized into organizational, process and technology challenges (research question two).
- Current stage of advancement of the 11 common initiatives in Malaysia will be compared against data collected from the Internet and archives about countries such as Mexico, Taiwan and Germany. (research question three)

3.10. Summary

This research thesis targets to investigate and report the relationship between government initiatives and benefits in terms of operational efficiency and organizational effectiveness. It also intends to identify challenges currently faced while implementing, and the level of advancement of the 11 common e-Government initiatives in Malaysia.

By administering the instruments described earlier, public agencies are surveyed to gather empirical data to show the benefits that already being reaped at the early stages of the e-Government implementation. The instruments are also designed to collect data about people, cultural, economical and organizational factors affecting the development of an effective e-Government implementation framework. The best feedback is deemed to come from MAMPU officials who are directly involved in managing the e-Government

implementation in Malaysia. Some interview sessions will be set with key decision makers in order to support the empirical data.

Data gathered will assist in the development of an implementation framework for implementing the e-Government initiative that is integrated in its structure, but yet flexible in a sense that it could incorporate any social changes pertaining to state and local governments.

CHAPTER 4: FINDINGS OF THE STUDY

4.1. Introduction

Findings of this research thesis are presented in the terms of input and output. The inputs to the research are the initiatives, benefits and challenges of implementing an e-Government which were obtained from the two surveys that were conducted via questionnaires and interviews. Additional data that was be obtained via archival and web search were be used to obtain the current standing of other e-Governments such as Mexico, Taiwan and Germany in particular in comparison with Malaysia.

4.2. Response Rate

In total, 360 questionnaires were distributed for the public agency professionals survey via e-mail. Samples were given one month to respond to the questionnaires. However, the researcher only received feedback from 72 (20 percent) of the total samples. Thus, the researcher took a different approach to gather the survey data. Samples were contacted on the telephone and an additional 144 (40 percent) questionnaires were fulfilled in this manner. These totals up to 60 percent response rate for the public agency professional survey.

As for the public agency executive interview, 90 executives were contacted and interviewed both on the phone and face to face as planned. Number of respondents to the interview was 23 of sample. This gives an overall response rate of 26 percent for the public agency executive interview.

4.3. Demographic Data

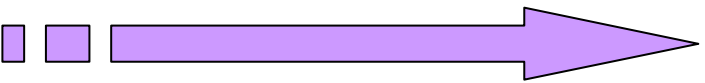
The public agency professionals' survey respondents mainly consisted of federal government level namely Ministry of Finance, Ministry of Civil Defense, Ministry of Energy, Water and Communications, Ministry of Agriculture and MAMPU. Customer-facing organizations composed 41 percent of the total respondents. 100 percent of respondents were from IT roles.

The Public Agency Executive interview respondents were mainly from federal government level. Of the total respondents, 73 percent were customer-facing organizations as opposed to only 27 percent from non customer-facing organization. 84 percent of respondents were IT roles and 26 percent were in business roles.

4.4. Survey Findings

4.4.1. E-Government Initiatives Implementation Status

The public agency professionals' survey extracted raw status details from hands-on officers who are involved in the e-Government implementation. Based upon the 11 common e-Government initiatives given, public agency professionals rated the status of its implementation in Malaysia. The mean of these ratings were then calculated and presented in the following Figure 4.1.



E-Government Initiatives	Not Planned		Planning		Up and Running	
IT infrastructure/enterprise architecture						✓
e-Workplace/Intranets						✓
Strategic planning					✓	
Strategic outsourcing					✓	
Business case analysis			✓			
Case management					✓	
Websites / Portal						✓
Business process/organization change			✓			
Enterprise resource planning (ERP)		✓				
Customer relationship management (CRM)		✓				
e-Learning					✓	
Legend:						
✓ Status / Rating						

Figure 4.1: E-Government initiatives implementation status.

4.4.2. Relationship between Benefit and Initiatives

This study evaluated the benefits of e-Government initiatives on improving operational efficiency and organizational effectiveness. For the initiatives that had not been

implemented yet, respondents rated based upon their opinion of what benefits it would bring if implemented. Overall, the ratings of survey respondents reflect their views that the initiatives provided moderate benefits – average score = 3.2 (Scale: 1 = low, 5 = high).

Analysis of the benefit scores led to three groupings of initiatives (see Figure 4.2):

- 1) Strong benefits: Moderate to high scores across
- 2) Moderate benefits: Moderate scores
- 3) Some improvement: Moderate benefits

	Rank	Benefit Score	Initiatives
Strong Benefits	1	3.56	IT infrastructure/enterprise architecture
	2	3.43	Strategic planning
	3	3.37	Website / Portal
	4	3.35	e-Learning
Moderate Benefits	5	3.27	Strategic outsourcing
	6	3.23	Case management
	7	3.19	e-Workplace/Intranets
	8	3.15	Business process/organization change
Limited Benefits	9	2.98	Enterprise resource planning (ERP)
	10	2.96	Customer relationship management (CRM)
	11	2.79	Business case analysis
Average		3.2	

Figure 4.2: Benefits ranking for e-Government initiatives implemented.

Among the strong benefits, changes to information technology (IT) infrastructure / enterprise architecture ranked highest. This initiative focuses on enhancing data management processes and systems and significantly improved information distribution, as well as the efficiency and effectiveness of customer service and service delivery.

Repositioning initiatives such as strategic planning and strategic outsourcing provided strong and moderate benefits respectively by promoting cross-functional collaboration and resolving organizational factors that can impede transformation. As a local level registration department professional noted, “Strategic outsourcing allows us to do work we could not otherwise do with limited staff which does not have adequate experience for the outsourced tasks.” Higher benefits were also indicated for website or portal and e-learning initiatives, which introduced an online presence of the public agencies and some sort of education programs for its employees.

The moderate benefits score for case management and, business process and organization change initiatives reflects benefits from business process reengineering or organizational restructuring efforts that were undertaken without technology and suggests that higher benefits could stem from jointly undertaking business transformation and technology implementations. E-workplace or intranets also scored moderate benefits from the automation of administrative and human resource processes, and mobility advantage for the public servants.

Additionally, widely publicized initiatives such as enterprise resource planning (ERP) and customer relationship management (CRM) solutions provided only some improvement. However, positive signs are evident. Many ERP and CRM initiatives are still in the process of implementation and benefits are beginning to accrue. Business case analysis scored the lowest benefits among all the initiatives rated by the public agency professionals.

One IT director at the federal level noted that their ERP implementation provides, better and quicker financial and HR information and makes fact-based decisions more common.

Some significant improvements were also identified for CRM systems. As a state finance administration manager stated, “We have implemented a CRM solution that allows us to track and manage all citizen complaints from inception to resolution. This has been a very successful tool for ensuring efficient resolution of citizen issues.”

4.4.3. *Efficiency and Effectiveness of the Initiatives*

When asked to rate the effectiveness of the initiatives in terms of achieving the eight criteria for optimized e-Government performance, the respondents had the following opinion generally.

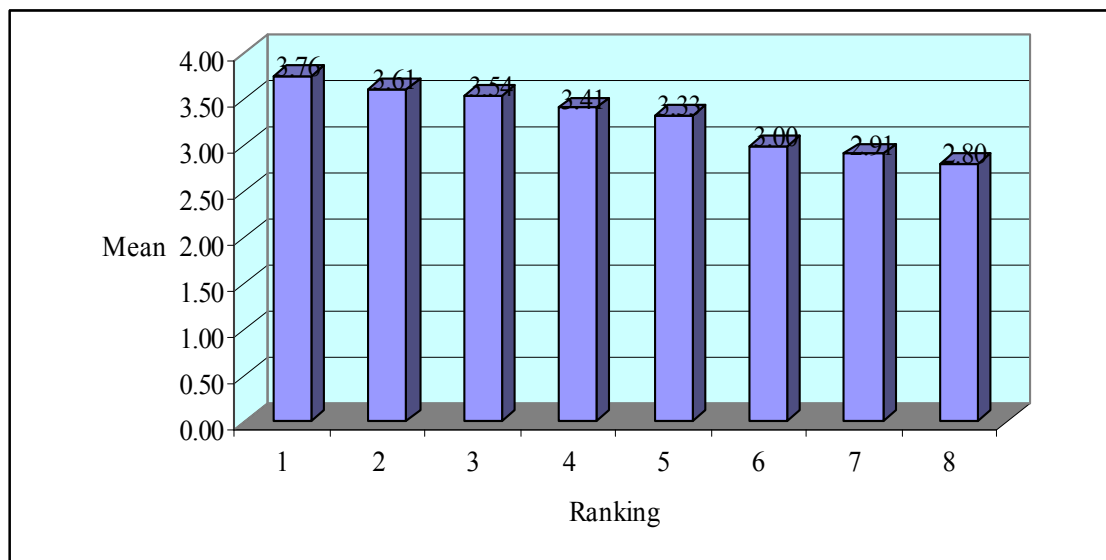


Figure 4.3: Efficiency and effectiveness of the initiatives implemented (graph).

The initiatives ranked can be grouped into four major categories of measurement that is depicted in the table below. The four categories are information management, administer and deliver services, employee development and financial improvement. Information management is a benefit area that measures whether the initiative promotes more effective

and efficient data capture, storage, analysis and use to improve services and manage operations. Administration and services delivery is the category that focuses on reducing service delays and errors by improving the efficiency and effectiveness of internal administration and customer service processes. Financial improvement focuses on reduces operating and service delivery costs to meet economic and budget pressures concerning data, processes and people management. The final category is employee development that aims to improve the efficiency and effectiveness of processes by helping employees to develop the necessary skills and knowledge to effectively administer and deliver services.

Rank	Benefit Criteria	Benefit Category
1	Improve distribution of information and communication	Information management
2	Provide more efficient/effective customer service	Administer and deliver services
3	Improve services delivery/cycle time	Administer and deliver services
4	Analyze information to improve decision-making	Information management
5	Improve data accuracy	Information management
6	Improve employee cross-functional skills	Employee development
7	Reduce costs of providing services	Financial improvement
8	Reduce operational expenses	Financial improvement

Figure 4.4: Efficiency and effectiveness benefits in four categories.

The four categories of improvement can be depicted in the following pie chart to indicate the percentage of each benefit category. From the Figure 4.5 below, Information management take the largest slice of the pie with 40 percent. Administration and delivery

of services as well as financial improvement takes the second and third largest pieces at 27 percent and 22 percent respectively. The smallest benefit category is employee development.

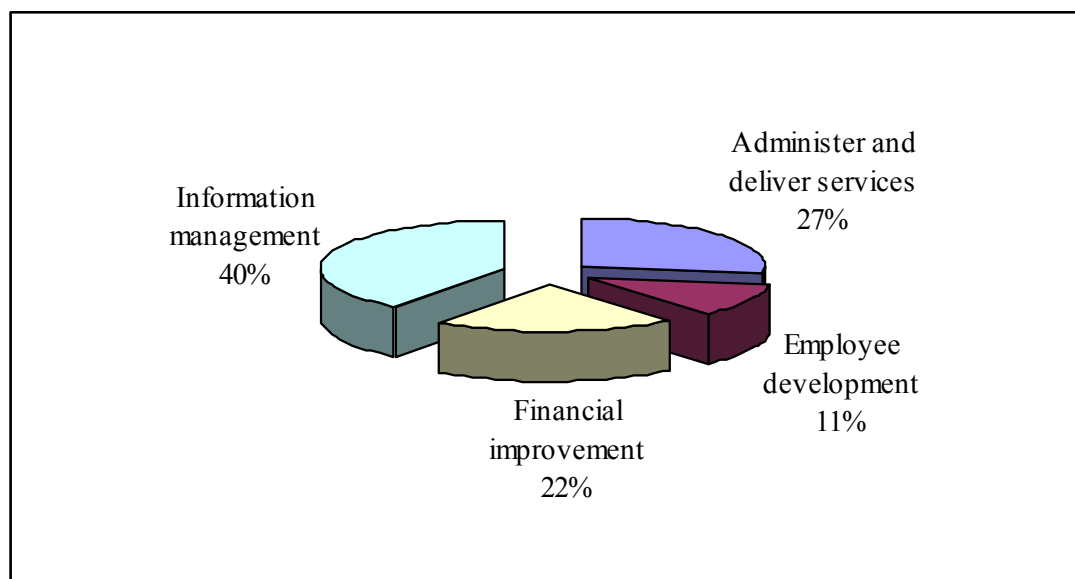


Figure 4.5: Ranking of the 4 benefit categories.

4.4.4. Challenges

The findings from the Public Agency Executive study identified three categories of change barriers facing state and local government leaders (see Figure 4.6). Major challenges in each of the three categories were extracted by calculating the percentage of “strongly agree”.

		Percentage (%)
Organizational Barriers	Resistance to change	13
	Lack of leadership support	8
	Lack of employee skills	21
	Limited knowledge transfer	5
Process Barriers	Limited cross-agency collaboration	17
	Lack of redefined business processes	4
	Internal politics	22
Technology Barriers	Lack of technology interoperability	2
	Prevalence of propriety systems	0

Figure 4.6: Barriers encountered by key public agency executives.

The following pie chart depicts the 3 categories of challenges that are listed above:

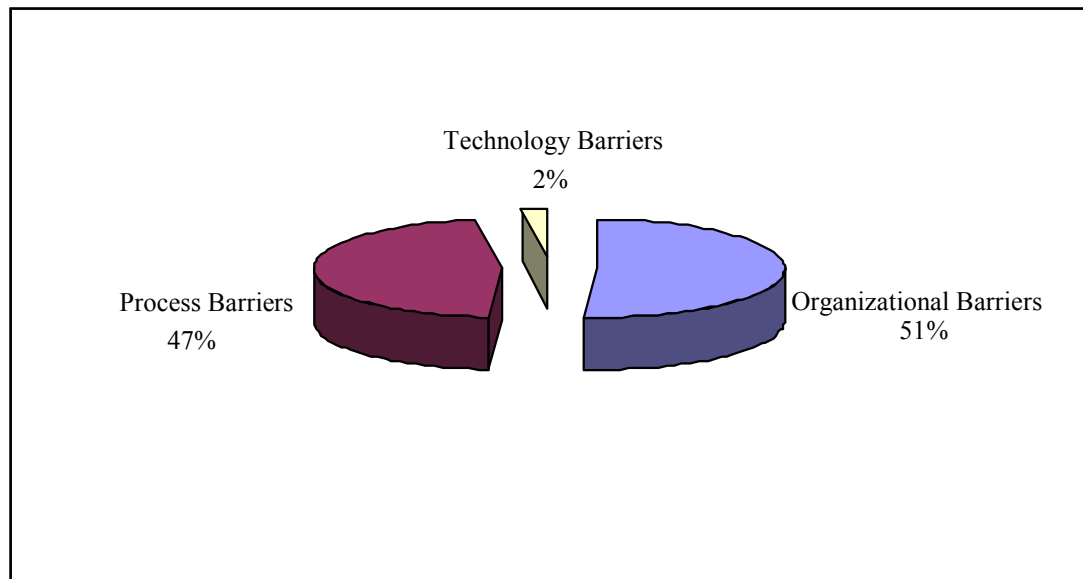


Figure 4.7: E-Government challenges in Malaysia.

The respondents also identified common actions they took to overcome these change barriers and to improve operational efficiency and organizational effectiveness. Some of the actions included:

- Establishing streamlined processes and management systems that demonstrate the linkage between investments in internal initiatives and external benefits for customers, communities and stakeholders
- Increasing the focus on financial performance by developing detailed financial objectives and targeting implementations on high-cost activities
- Increasing the focus on employee skill development through proactive efforts to transfer knowledge before, during and after implementation
- Gaining commitment from leaders to developing a new business culture – one that focuses on process and organization transformation and rewards performance management, knowledge development and cost reduction
- Shifting decision-making from a silo, entitlement and administration focus to a collaborative, outcome- and value-driven approach.

Barriers vary between different levels of government agencies. The barriers can be organizational as well as technical. For example, benefits for an agency when comparing between state 1 and state 2 is often to improve customer support with the use of self-service applications. A barrier between these states might be that the organization doesn't have the skills to handle the new system.

4.4.5. Current Standing

The study findings showed that most of the 11 initiatives that were measured against were still mostly in the planning stage for Malaysia. The current e-Government portal although up and running, is still only at the broadcasting stage because of the 28 ministries in Malaysia, only 271 of the total 350 government agencies that has a web presence, actually has an accessible website. This means that there are still 22.5 percent of public agencies in Malaysia that has not brought up a website yet.

The Mexico, Taiwan and Germany e-Governments are well ahead of Malaysia where public services such as license renewal, passport renewal, company name application and tax filing are offered on the e-Government portal. As of April 2006, the salary income group taxpayers in Malaysia are able to file their taxes online through the e-filing system. Figure 4.8 above depicts the 11 common initiatives that have been implemented in four countries including Malaysia.

E-Government Initiatives	Malaysia	Mexico	Germany	Taiwan
IT infrastructure/enterprise architecture	✓	✓	✓	✓
e-Workplace/Intranets			✓	✓
Strategic planning	✓	✓	✓	✓
Strategic outsourcing			✓	✓
Business case analysis			✓	
Case Management			✓	✓
Website / Portal	✓		✓	✓
Business process/organization change			✓	
Enterprise resource planning (ERP)			✓	✓
Customer relationship management (CRM)	✓		✓	✓
e-Learning	✓	✓	✓	✓
2002 Ranking	20	23	9	Not ranked
Legend:				
✓ Started Implementing / Completed				

Figure 4.8: E-Government initiatives in Malaysia, Mexico, Germany and Taiwan.

4.5. Gap Analysis

According to Accenture (2002), the number one leader among e-Governments is Canada.

Malaysia's neighboring Singapore is a close rival at the number two position scoring only

one percent less than Canada. Singapore currently stands as the best e-Governments in Asia Pacific and second in the world after Canada. Malaysia ranks twentieth according to the same study. Singapore and Malaysia are very closely related in many aspects, thus it would be fair to compare between the two e-Governments. Taking a high level comparison between the two e-Governments, Malaysia is ranked as an emerging government as compared to Singapore that is ranked as a leader in e-Government development. The tendency is to look for some key events that led to the success or failure of both countries.

With regard to execution, take the MSC for example. Today, Malaysia has a first-class ICT infrastructure in place at Cyberjaya but rapid ICT industry development and pervasiveness still escapes. MSC has slowed down progress, distracted by other areas of development that do not have a niche or competitive advantage. This distraction and dilution of efforts make it difficult for the national ICT project to achieve its grand plan and objectives.

Meanwhile, Singapore took first place last year on the Networked Readiness Index in the Global Information Technology Report 2004-2005. This was due to its superior performance in getting individuals and the government to tap into the potential of ICT and the government's actual usage of ICT.

ICT literacy programs in Malaysia were targeted at 90 secondary schools and 20 primary schools via the Smart School concept, but the PCs made available were usually kept under close supervision. The pockets of efforts to get the rural and town folks to use PCs were obstructed by the lack of follow-through and poor broadband infrastructure. Today, less than 10% of the Malaysian population is on the Internet.

In contrast, Singapore got real when it single-mindedly made sure that its ICT efforts benefited the citizens first and the government second. Notice how the people come first in Singapore and note the concept Collins found in his research of great companies, "First Who, Then What". Unfortunately, Malaysia tends to put the infrastructure, facilities, strategies and the operations process first leaving the people process last.

Under the Ninth Malaysia Plan, the Government announced that it is targeting five key measures to improve service delivery by leveraging on ICT adoption. The measures are:

- Enhance and strengthen existing ICT systems
- Strengthen human resource development; establish strong infrastructure
- Ensure effective cross-agency collaboration
- Ensure effective performance management.

If the citizen-centric focus is missing from the equation, success would be hard to come by. For instance, one of the seven flagships under the MSC initiative, the e-Public Services was originally envisioned to be people oriented, customer-focused and electronic. Pilot programs such as e-summons and e-assessment were launched but they were more focused on revenue collection for the government than meeting the transactional needs of ordinary citizens.

Singapore's e-Government action plan was launched in 2000 and then to ensure that the public service became a fully networked government capable of bringing value-added e-services and citizens closer together, the second e-Government action plan was introduced in 2003. Singapore's S\$38 million investment in its Infocomm Security Masterplan (2005-

2007) aims to protect the country's information and communications environment and the first three strategies are to "secure the people, private and public sectors respectively." Again, notice that it is people that come first.

In the Ninth Malaysia Plan, developing Malaysia's human capital should be on top priority. Malaysia can still achieve leadership in human capital and talent development but, there is a dire need to change mindsets and have a great will and determination to transform the educational and training institutions, public and private sector institutions and organizations in all aspects. Failing to which Malaysia might end up wallowing in its past successes and be surpassed by many other nations as it continues to lose the edge.

4.6. Other Findings

Other findings that the researcher deemed relevant to this thesis are presented in this section. These findings were mainly derived from archival search of online surveys conducted by MAMPU since March 2005.

The first survey that was conducted between March and April of 2005, intended to gather public view about the Malaysian e-Government portal. A total of 1427 people participated in this survey to rate the portal on a Likert scale. A total of 53 percent rated it as Poor versus only 10 percent who rated it as Very Good. Others rated Good, Satisfactory and Neutral at 24 percent, 9 percent and 4 percent respectively.

Between April and May 2005, the public again were surveyed to gauge the online services offered in the portal which were deemed most beneficial. Of the total of 163 participants who responded to the survey, 26 percent found the online Directory very useful. The portal was very basic that 20 percent of the respondents found the only the Quick Links and Search function most beneficial to them. Announcements and Resource Centers on the portal turned out useful for 14 percent and 12 percent of the respondents respectively. Services such as Online Transactional Services, Downloadable Forms and Calendar Events needs much improvement because they were ranked the worse with only 4 percent, 3 percent and 1 percent people found it useful.

Another survey conducted between May and June 2005 intended to find out the ease of getting government-related information on the portal. The study that was open to the public had 375 participants. Majority (33 percent) of respondents found information by using Internet search engines where as 29 percent found intended information by browsing through the portal Directory. Others went directly to the agency websites (15 percent), used the portal Search engine (12 percent) and the portal's Quick Links (11 percent).

A total of 2083 members of the public participated in a survey conducted between June and August 2005 to identify the main causes of public reluctance to use online services. 34 percent of the participants blamed their reluctance on the unpredictable availability of the portal services. 33 percent did not have the infrastructure to access the Internet thus are unable to experience online services at all. Some of the participants (16 percent) do not trust in the security of online transactions. 10 percent of participants' preferred over-the-counter services rather than the impersonal offering of online services. There are 4 percent

of the participants who do not see the need for online services at the moment and 4 percent who are just reluctant to use online services without any reason.

On another note about where the public find it convenient to access the portal, 50 percent answered that they preferred their Office. Others ranked venues such as their homes; cyber cafes; schools, colleges or universities; and other public premises at 21 percent, 17 percent, 10 percent and 2 percent respectively. This survey was conducted between August and September 2005 and 1137 people participated in it.

4.7. Summary of the Findings

The aim of the research questions was to better understand the relationship between government initiatives and operational efficiency and organizational effectiveness benefits. A total of 216 Malaysian public agency professionals and 23 executives (primarily federal and state government representatives) participated in a survey and rated the benefit of various initiatives on operational efficiency and organizational effectiveness. The survey specifically evaluated:

- Status of initiatives implemented
- Overall operational efficiency and organizational effectiveness benefits from the initiatives
- Challenges and success factors from implementing the initiatives

Based on some of the interviews with key public agency executives, the full potential of government IT initiatives will not be realized until business-process and cultural changes are enacted along with technology implementations. Among key findings are:

- IT investments that are deemed to have the highest benefits are infrastructure and enterprise architecture, strategic planning, website or portal and, e-Learning initiatives. Those deemed with the least benefits are enterprise resource planning, customer-relationship management and, business case analysis.
- Overall, initiatives provided moderate operational efficiency and organizational effectiveness benefits – average score = 3.2 (Scale: 1 = low, 5 = high)
- The primary benefits across all initiatives were improved information distribution and more effective/efficient customer service, even when these were not the primary goals of the initiatives

CHAPTER 5: PROTOTYPE DESIGN

5.1. E-Government Portal Functional Framework

This section highlights the functional perspective of the e-Government implementation framework. The diagram below depicts the functional aspect that will be presented in order to provide a customer-centric oriented online government services.

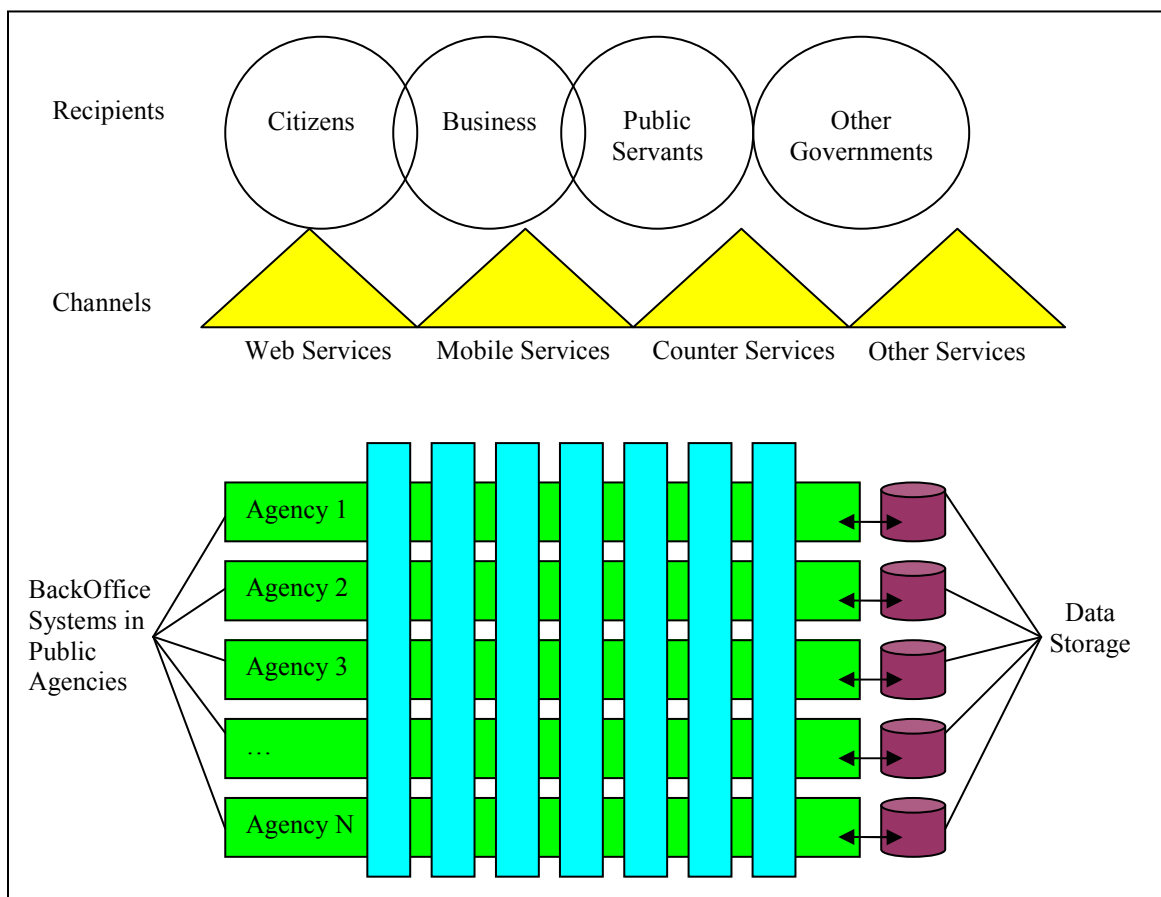


Figure 5.1: E-Government Portal Functional Framework

When seen from a functional perspective, the e-Government portal should be a seamless integration of services offered by the government agencies. This would require massive

back office integration of data storage and authentication standards that is further described in the following section.

5.2. E-Government Portal Infrastructure Framework

The e-Government infrastructure to support the functional framework is proposed as depicted in the following diagram (Figure 5.2).

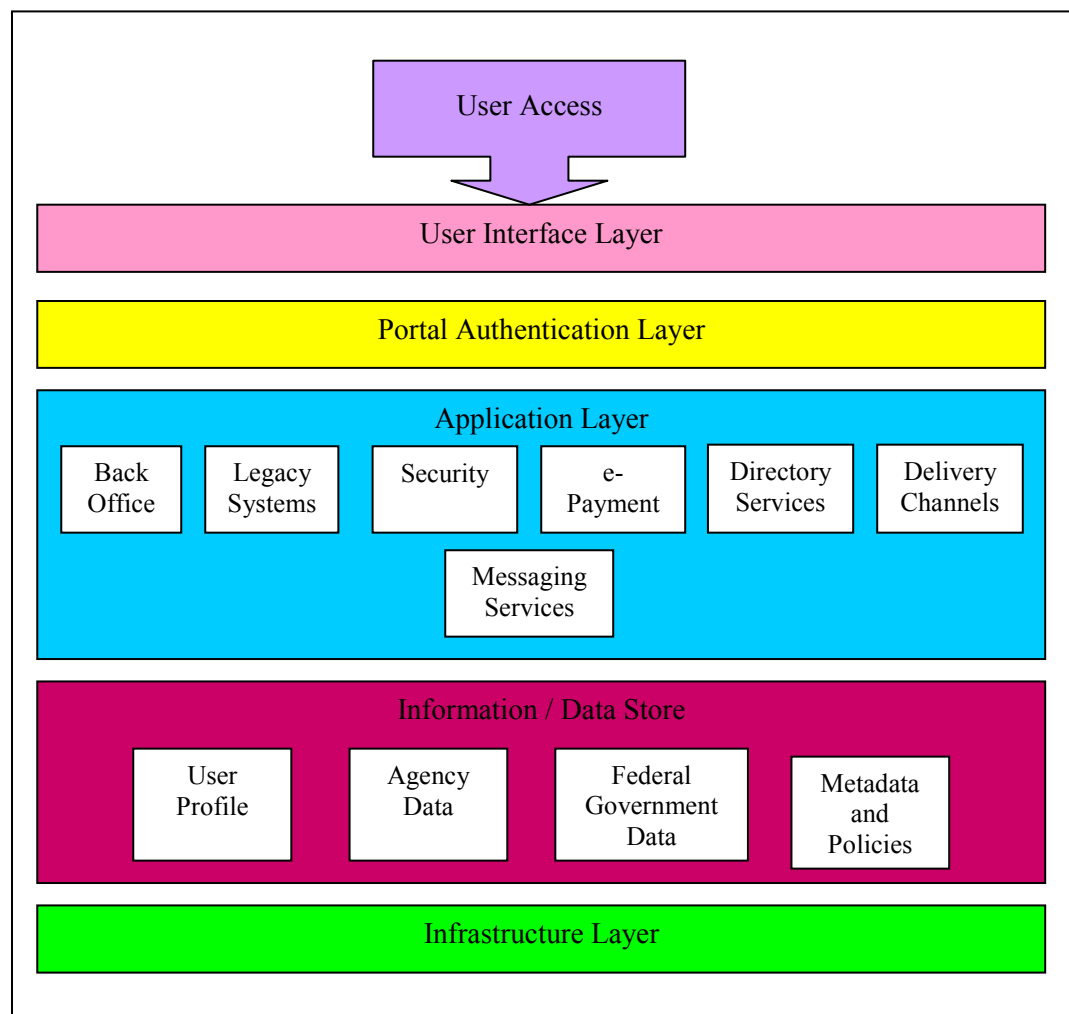


Figure 5.2: E-Government Portal Infrastructure Framework

5.2.1. User Access Layer

The proposed portal access layer would be web access via a browser such as Internet Explorer, Mozilla Firefox etc. Future access layers that may be required are pervasive device access such as mobile phones, PDAs and other devices. Data Store, Application, Authentication and User Interface layers are further elaborated in the following sections.

5.2.2. User Interface Layer

The researcher developed a prototype e-Government interface based on the proposed framework that could be used as a standard for the e-Government interface format. The prototype is meant to be a sample or a trial product that does not have the full functionality intended.

In the home page, services deliveries that are targeted to different users of the portal are clearly depicted and available in both the English and Malay language. The following are the categories:

a) eCitizen

The G2C Initiative provides one-stop, on-line access to information and services to citizens. The portal presents citizens with a single “front door” to government, allowing them to receive accurate, timely, and consistent answers and information.

Loan tools, job availability, senior citizen and disability registration could be done online. Additionally, citizens can file their taxes online for free.

- Consumer Guides and Protection
- Healthcare and Disability
- Jobs and Education
- Money and Taxes
- Public Safety and Law
- Senior Services
- Tourism and Recreation
- Traffic and Weather
- Utilities
- Voting and Elections

b) eBusiness

The G2B initiative is committed to helping business interact efficiently and effectively with the government. These Initiatives help reduce burden on businesses, provide one-stop access to information, and enable digital communication using the language of e-Business.

Businesses can benefit from these initiatives through a series of one-stop portals, for regulations and exports. These sites can provide comprehensive government-wide information related to business-oriented topics.

eBusiness allows businesses to access information about laws and regulations and relevant forms needed to comply with government requirements for their business. The Consolidated Health Information database can adopt health data standards to allow

health information to be shared securely across government agencies and healthcare organizations. Examples of eBusiness applications provided on the portal:

- eProcurement
- eEconomy enabling legislation
- Business tax applications
- Business licensing application
- Tender Offerings

c) eEmployee

Through the eEmployee Initiative, the government is able to migrate online training services from many agencies to one, while supporting areas of competency in achieving human capital goals. By integrating human resources, HR managers and specialists are provided with a data warehouse and workforce planning and analysis capabilities such that trends for retirement, promotions, and reassignments can be accurately and efficiently forecast.

Information about outsourcing or acquisition partners results in an agency-shareable single vendor-performance file; a single vendor registration area that makes it easier to do business with the government, and a community platform for the Intra-Governmental Transfers, a significant governmental accounting challenge. The recruitment site simplifies the process of locating and applying for government jobs by delivering a “create once, use many” basic job resume to apply to multiple vacancies.

The electronic records management system provides policy guidance to help agencies better manage their electronic records, so that records information can be effectively

used to support timely and effective decision making, enhance service delivery, and ensure accountability.

- Employee's Provident Fund (EPF)
- Vacation and Sick leave
- Civil Service Examination Processes
- Self-help
- Job Openings
- eLearning and Training
- Communities of Interests
- Forums
- Gov-pages

d) eGovernment

The goal of the G2G portfolio is to forge new partnerships among levels of government. These partnerships facilitate collaboration between levels of government, and empower state and local governments to deliver citizen services more effectively.

The site's focus is to apply industry best practices to government. Business transformation successes by increasing cross-agency partnerships, empowering citizen focus and prudent utilization of resources and encouraging stovepipe systems reductions is crucial to improvement.

- Legislative
- Elected Officials
- State Agencies

i. [Alphabetical List of Agencies]

- Judicial
- Local Government
- State Committees

e) Visitors

- Immigration Guide
- History
- Travel and Living
- Safety and Regulations
- Forums

5.2.3. Portal Authentication Layer

System-level authentication between servers and applications should be in place to ensure that information flows have the correct authorization and robustness. The portal should incorporate Single Sign-on. Once an end user has authenticated, he or she must be able to move among applications with equivalent (or lower) assurance levels without the need for re-authenticating.

As part of the e-Government framework, the Portal Authentication layer has to be established to enable trust and confidence in e-Government transactions via the establishment of integrated policy and technical infrastructure for electronic authentication. The prototype that was developed for this thesis does not have an authentication component in the infrastructure. The layer leverages credentials from multiple credential providers

through certifications, guidelines, standards adoption and policies. Over time, the authentication component should support multiple schemes such as the assertion-based authentication (i.e. authentication of PIN and password credentials), and Security Assertion Markup Language (SAML). Therefore should not be built around a single scheme or commercial product. The authentication component is targeted for incorporation as a government-wide authentication component.

The Portal Authentication Layer will offer a certificate validation service to agency applications. Figure 5.3 depicts the use of the certificate validation service for authentication. In Step 1, the end user starts at the Portal and is passed directly to the agency application for authentication when a login is initiated, as shown in Step 2. The Transport Layer Security (TLS) and Secure Socket Layer (SSL) allow the end user to authenticate using a certificate without revealing any secret information. The agency application authenticates the end user in Step 3, then delegates validation of the certificate to the validation service in Step 4. To the greatest extent possible, the validation service will be comprised of commercial off-the-shelf products using standard protocols.

Over time, the validation service may support multiple products and standards, but the functionality will remain the same. The approach has to be an architectural framework showing where appropriate standards can be adopted as they mature. The TLS/SSL protocol requires the web server to present a list of acceptable certification authorities to the browser during the TLS/SSL handshake in Step3.

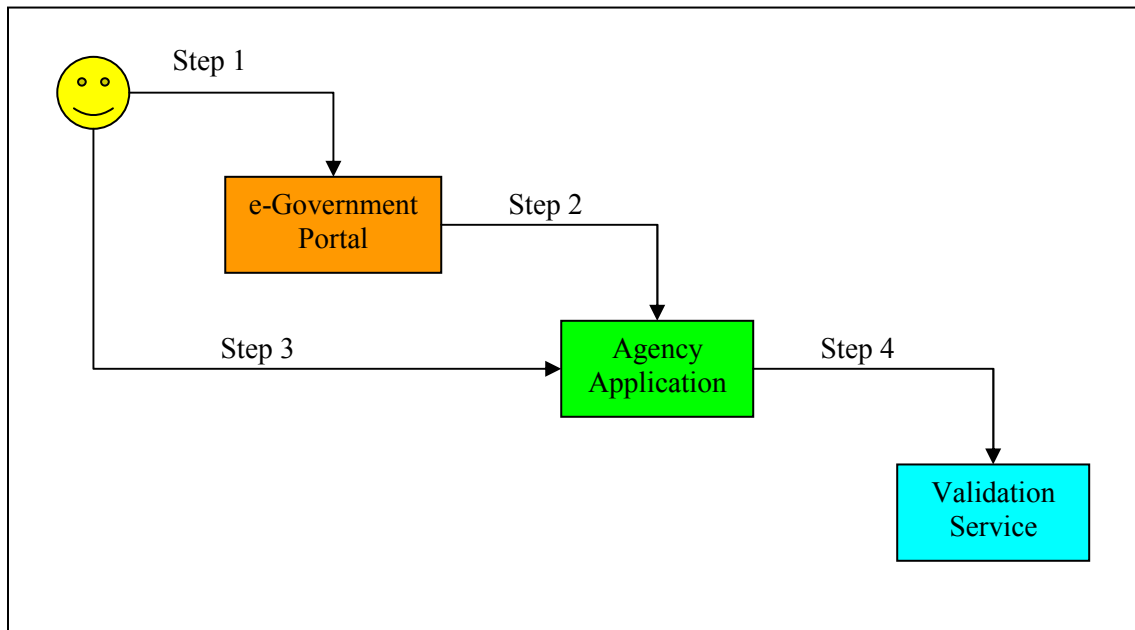


Figure 5.3: E-Government Portal Certification Authentication Service

While the authentication architecture addresses authenticating end users to applications, authorization privileges at the application are beyond the scope of this research. High-level requirements such as leverage credentials and single sign-on were discussed. Key components such as agency applications, credential services, and end users, needs to be defined and validated, as well as session types allowed within the framework (browser session, authentication session, and agency session).

PKI credentials offer considerable advantages for authentication. They can be validated using only public information. Standards for PKI are also more mature and more widely used than the emerging standards for assertion-based authentication of PIN and password credentials.

5.2.4. *Application Layer*

The application layers will consist of both new systems as well as legacy systems that have to be integrated to allow a seamless online service delivery. In this section, various applications that are necessary to be integrated into the portal framework are described briefly.

1. Back office

Back office components are such as collaboration tools like shared workspaces and inter-agency workflow applications.

2. Legacy

Legacy applications are existing systems that can continue to be used only because their processes are still the same or better systems have not been identified. However, legacy systems cannot exist as stand alone systems anymore; they would need to be integrated with new systems wherever the process requires. In order to bridge the gap between the legacy systems and the new systems' communication, middleware and messaging services will be required.

3. Security

Gateway services that enable systems and applications to interoperate with minimal infrastructure investments, whilst observing the requirements of appropriate security and privacy legislation would be required as part of the portal framework. This layer not only ensures protection against malicious attackers, but also ensures privacy of citizens' data.

4. E-payment

Online services would be incomplete without allowance for payment functionality.

Incorporation of payment gateways would allow online transactions to be done easily and securely. Moreover, similar payment functions can be re-used or incorporated into other agency applications.

5. Directory Services

Website components such as Directory services that allow agencies, their organizational units and offices to be quickly and easily located is also a pre-requisite to a successful e-Government portal.

6. Delivery Channel

Currently, government service delivery channels are the traditional customer-facing counters and some online forms that still have to be submitted manually. Accessibility standards that enable the widest possible range of users to interact with the web-based services of government have to be taken into consideration. This is to enable mobile devices to be used for transactions in the future.

7. Messaging Services

Public agencies have been using various different standards and software. Technical messaging services that allow systems and applications to interchange data using pre-agreed standards have to be set up to facilitate an integrated system.

5.2.5. Information / Data Store Layer

Data store is like a gold mine and at the same time can also be quick sand if not managed well. In order to have an integrated and federated database, the following format of data store and standards are proposed.

1. User Profile

Each public agency would have to maintain existing data and still allow access by other agency application to its storage that contains citizens', businesses' and government employee profile.

2. Agency database

The agency database contains information of government agency profiles under topics such as objectives, functions, incentives and exemptions, laws and regulations, publications as well as licenses and permits. Other than internal data, tender information and public news would have to be well maintained.

3. Metadata and policies

Metadata is a dictionary that contains description of the services provided, and to ensure all the functions of government are described in consistent terms easily understood by a wide range of citizens. Policies can be used to ensure all agencies uses standardized terms and interfaces for web page and application development.

4. Federal Government data

The federal government has to keep federal information for example a tariffs database that contains information on import duties, export duties and sales tax. The federal government

would also have to maintain a statistical database that contains information on commodities and trade statistics among others.

5.2.6. *Infrastructure*

Based upon the researcher's Internet study on open source software, it was determined that the Apache Application Server was the best mechanism to effectively provide citizens and businesses with online services that will be more accessible, more convenient, and more responsive in conducting public business. A powerful server such as the IBM pSeries server running RedHat Linux would be capable of providing the hosting service. MySQL is an open-source database management program that has more than 5 million users worldwide. MySQL is able to offer similar benefits compared with commercial database programs for some applications. For the programming language, public sector technology experts say simplicity and efficiency are two of the top benefits of PHP. PHP is a general-purpose scripting language that moves data from databases to Web servers, among other jobs.

However, for the purpose of the prototype, the researcher developed a prototype solution using Microsoft Visual Studio Developer and used a free hosting service to host the ASPX website. To minimize the risks surrounding Internet security, the researcher's did not use genuine user information and field properties for the prototype. The free web hosting uses Microsoft Internet Information Server (IIS) and Microsoft Access database. In addition to IIS as the primary portal engine, Microsoft .Net Visual Studio Developer, Microsoft Access and ASPX pages was used.

The infrastructure of the proposed portal consists of four layers namely network, processor, storage and redundancy that are briefly explained as follows:

1. Network

A backbone network that is able to support the web service delivery of the e-Government is required for the portal. It would require technology for fast and reliable service.

2. Processor

The design of the machines chosen has to be sized according to the load and required response time and also able to support future growth (scalable). The servers themselves should have high availability features built in to support a 24 by 7 operation.

3. Storage

Storage should be huge and fast with flexibility for growth to support a dynamically changing environment. Storage management software could be considered for ease of administration and consolidation.

4. Backup and redundancy

Enterprise backup software is required for ensuring data is not lost in case of a failure. For cases of total lost, a disaster recovery (DR) site for business continuity and recovery is naturally required.

5.3. Prototype Working Portion

Due to time and resource constraints, the researcher developed only three modules of the prototype, namely Passport Renewal, Driver's License Renewal and Job Application. All three modules belong to the eCitizens service line. Other than these 3 modules, another module was developed for Login authentication. For evaluation, the website can be viewed from <http://www.fsktm.somee.com>.

5.3.1. Portal Login (Single Logon)

Citizens are required to login to the portal before the Online Services become available to them. Users key-in an 8 character user id and password to authenticate against the password stored in the database. At the moment, the portal does not keep track of the number of invalid logins tried by the user or lock out any subsequent invalid tries.

Using this portal login, the researcher addresses the need of having a single login to access online services offered by the government. This solves the issue of having a disparate set of services agencies that are not collaborated and service oriented. The following screenshot depicts the login function on the main page.

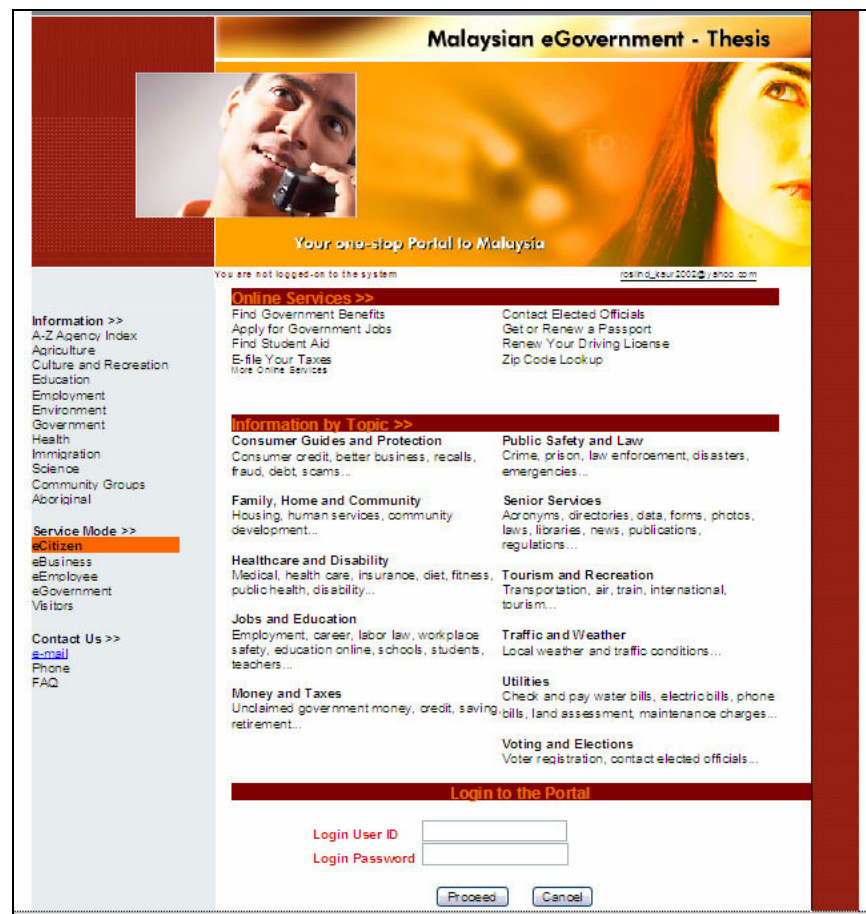


Figure 5.4: Portal Login Page

5.3.2. *Passport Renewal (Department of Immigration)*

The passport renewal link will be enabled once the user has logged in successfully. After logging in, a session ID is established and used for extracting user data from the database. Thus, in the passport renewal page, the user is able to see the passport expiry date and next select the amount of years that he wants to renew for. Currently, there is no checking mechanism for checking the maximum amount of years the passport is renewable. For payment, the user is required to enter a 14-digit Visa or Master credit card number that can

be verified with a Payment Gateway (like MEPS). For the purpose of this prototype, there is no connection to any payment gateways.

Once the renewal is successful, users will be able to print out a computer generated receipt as proof of transaction. The following screenshot depicts the passport renewal and successful renewal pages respectively.

Malaysian eGovernment - Thesis

Your one-stop Portal to Malaysia

10/11/2002 10:00:00 AM

Renew Your Passport

Personal Details:

User Id	rosind	Name	Roslind Kaur
Passport Number	P123333	Passport Expiry Date	1/31/2004
NRIC No.	780819145110		

Passport Extension Period:

Select Number of Years: Year(s)

Credit Card No.

Information >>
A-Z Agency Index
Agriculture
Culture and Recreation
Education
Employment
Environment
Government
Health
Immigration
Science
Community Groups
Aboriginal

Service Mode >>
eCitizen
eBusiness
eEmployee
eGovernment
Visitors

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Figure 5.5: Passport Renewal Page

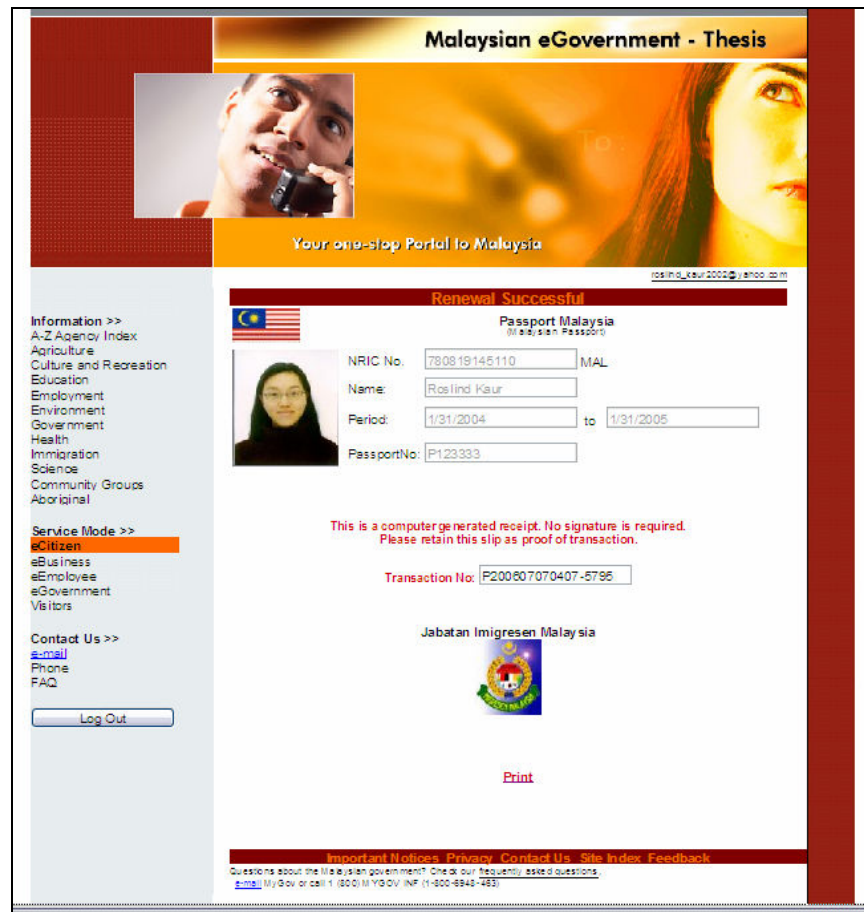


Figure 5.6: Successful Passport Renewal Page

5.3.3. Driver's License Renewal (Road Transport Department)

The driver's license renewal link will be enabled once the user has logged in successfully. After logging in, a session ID is established (similar to the passport renewal function) and used for extracting user data from the database. Thus, in the driver's license renewal page, the user is able to see the passport expiry date and next select the amount of years that he wants to renew for. Currently, there is no checking mechanism for checking the maximum amount of years the license is renewable. For payment, the user is required to enter a 14-

digit Visa or Master credit card number that can be verified with a Payment Gateway (like MEPS). For the purpose of this prototype, there is no connection to any payment gateways.

Once the renewal is successful, users will be able to print out a computer generated receipt as proof of transaction. The following screenshot depicts the passport renewal screen.

Malaysian eGovernment - Thesis

Your one-stop Portal to Malaysia

rosling_kaur2002@yahoo.com

Renew Your Driving License

Personal Details:

User Id	rosling	Name	Rosling Kaur
License Type	D	License Expiry Date	1/31/2003
NRIC No.	780819145110	Serial Number	J1234451

License Extension Period:
Select Number of Years: 1 Year(s)

Credit Card No.

Information >>
A-Z Agency Index
Agriculture
Culture and Recreation
Education
Employment
Environment
Government
Health
Immigration
Science
Community Groups
Aboriginal

Service Mode >>
eCitizen
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Figure 5.7: Driver's License Renewal Page

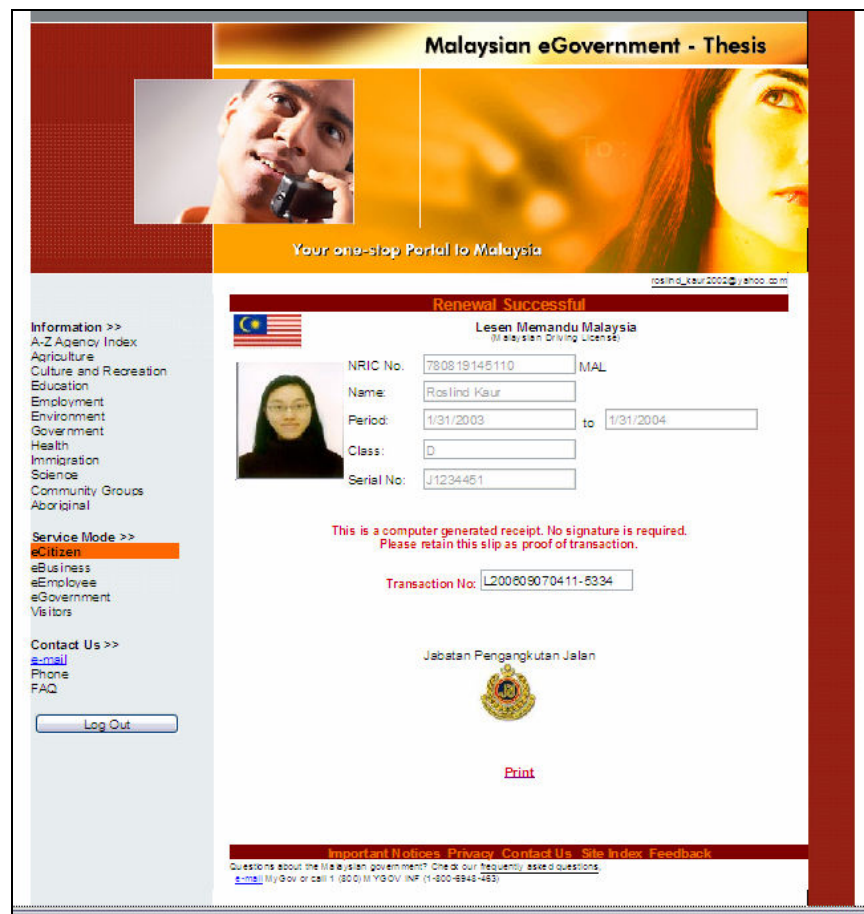


Figure 5.8: Successful Driver's License Renewal Page

5.3.4. Government Job Application (Public Services Commission)

The "Apply for Government Jobs" link will allow users to upload curriculum vitae information to the e-Government database. This page is depicted in the following screenshot.

Malaysian eGovernment - Thesis

Your one-stop Portal to Malaysia

Apply for a Job

Personal Details:

User Id: Name:
 NRIC No.:

Education Background:

Select Highest Qualification Level:
 Name of Institution:
 Graduation Date:

Work Experience:

Last Company Worked for:
 Number of months:
 Description/Scope of Job:
 Reason for Leaving:

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Figure 5.9: Government Job Application Page

5.4. Summary

In summary, the prototype that has been proposed requires further development although its design has been proposed here. The four function prototype that was developed by the researcher gives a feel of the main objective without the frills. Enabling users to have a single login and a single doorway of access to the government is aligned to the mission to have a customer and service oriented architecture. Without this, each government agency will be serving its own set of customers and citizens would have a feeling of being sent on a run-around because of the lack of a centralized system.

In order to meet this collaboration requirement, the e-Government requires a metadata standard that can be used and reused by all agencies. However, the scope of the metadata is beyond this thesis.

CHAPTER 6: CONCLUSIONS AND DISCUSSION

6.1. Summary

6.1.1. Purpose of the Study

This research thesis was written with the objective of finding an effective and efficient implementation framework of the Malaysian e-Government. More specifically, the researcher highlighted the relationship between e-Government initiatives and the benefits achieved in terms of organizational effectiveness and operational efficiency. Then, the researcher also identified the challenges of the initiatives. With the data gathered and analyzed, an e-Government implementation framework was proposed for an efficient and effective implementation. For benchmarking reasons, the researcher presented the current status of the initiatives in Malaysia compared to Mexico, Germany and Taiwan.

6.1.2. Research Design

The researcher adopted the survey method for economic reasons. The government agencies including MAMPU were broken down into two categories i.e. public agency professionals and public agency executive. The public agency professionals were sent thesis based questionnaires via mail. Reliability of the survey data was ensured by requiring public agency professionals to signoff their responses before returning the questionnaires. This group of sample contributed to the development of findings for relationship between initiatives and the benefits on effectiveness and efficiency, besides the status of common initiatives.

The second category of samples, the public agency executives were called for telephone interview sessions. These interviews retrieved the key challenges in e-Government implementation from executives with first-hand experience in this area.

6.1.3. *Instructional Material*

Two separate instructional materials were administered to the different categories of sample in order to obtain different spectrums of opinions. The first instructional material was administered to public agency professionals in order to attain the following objectives:

- To highlight top goals of the e-Government initiatives in Malaysia and its impact to improvement in public services
- To rate the benefits achieved to-date from the e-Government initiatives
- To find out the current standing of the Malaysian e-Government as compared to the rest of the world.

The second set of instructional material was administered to public agency executive level key decision makers to gather their opinion on:

- common barriers in terms of organizational, process and technology in e-Government implementation
- additional comments on how to remedy the challenges

6.2. Findings and Conclusion

6.2.1. *Findings Discussion*

Much of the strong benefit initiatives identified does not point to collaboration among departments and the elimination of process, organization and technology change barriers

during planning and implementation. These are very important aspects of an effective and efficient implementation of the e-Government that does not seem to get as much attention as it deserves. By contrast, some of the initiatives that was deemed lower-performing were not mere IT initiatives (i.e. website or portal and e-learning initiatives), but involves incorporation of business transformation to accompany the implementation efforts. Without performing key tasks such as business process redesign, ongoing training, communication planning or knowledge transfer, governments cannot realize the full benefits from initiatives.

The findings also suggest that governments are experiencing improvements, but may not have yet fully leveraged the complete functionality of some initiatives.

Examining the overall benefit scores suggests the results shown in Figure 4.2 may stem from various factors:

1. Most investment areas require significant business and organizational change to achieve the desired ROI. Successful initiatives combined technology investments with business and organization transformation. Many of the studied initiatives did not include major changes to existing processes, organizational structure, roles or business models – thereby limiting benefits primarily to improved information access and faster customer service.
2. Collaboration is important thus government initiatives must focus on improving collaboration among departments and with customers – for example, by establishing consolidated databases and leveraging integrated processes and data.

3. Benefit scores in this survey may be lower than in reality because:
 - a. Departments are often conservative in their estimations, and
 - b. They may not have detailed performance data.
 - c. Complex initiatives, such as ERP and CRM, often result in simultaneous usage of multiple systems. This can add near-term burdens for employees, who may not recognize benefits while still in transition.
4. Operational efficiency and organizational effectiveness benefits stem from process, technological and organizational change which often represents long-term efforts, so it is possible that full benefits may not yet be apparent.

6.2.2. Conclusion

The e-Government initiatives that are deemed beneficial are those that have immediate or concrete appearance. Initiatives such as process improvement and streamlining have to take a back seat to give way for nice looking web features. This is also causing a mass growth of dispersed islands of services that are ineffective in terms of service delivery. The effect of these substandard IT investments is blurring the actual aim of the e-Government portal in the first place.

Lack of management support and commonness of political steering is has been the cause of lack of trust amongst public sector employees. In order to rebuild the trust in employees, a strategic approach has to be taken in the implementation of a new and consolidated government portal.

State and local governments are making significant investments, but their results are not fulfilling expectations often enough. With no end in sight to financial constraints, there is an ongoing need to optimize the ROI of every initiative. The full potential of government initiatives will not be realized until business process and cultural changes are enacted along with technology implementations. Planning for a comprehensive transformation that removes organizational, process and technology barriers may be the way to achieve more significant payoffs.

The study shows that state and local survey respondents understand that managing the ongoing financial crises and improving customer services requires eliminating internal process inefficiencies.

Standing in comparison among peer countries i.e. Mexico, Germany and Taiwan, the Malaysian e-Government seems to have ventured into most of the e-Government initiatives but significant progress were only seen in the following initiatives:

- IT infrastructure / enterprise architecture
- Strategic planning
- Website / Portal
- e-Learning

It is possible that these four initiatives are just the indication of the beginning of the e-Government implementation in Malaysia.

6.3. Proposed E-Government Framework

6.3.1. Elements of the Implementation Framework

Based on the data collected from the survey the researcher presents a framework for effective and efficient implementation of e-Government. The underlying theoretical framework that was used to develop it is based on the Project Management approach by the Project Management Institute (PMI). The researcher suggests that each of the e-Government initiatives can be approached as a single project. This would allow a systematic approach in tackling all initiatives in the e-Government implementation. The implementation framework consists of five elements that can be shown in the Figure 6.1 below.

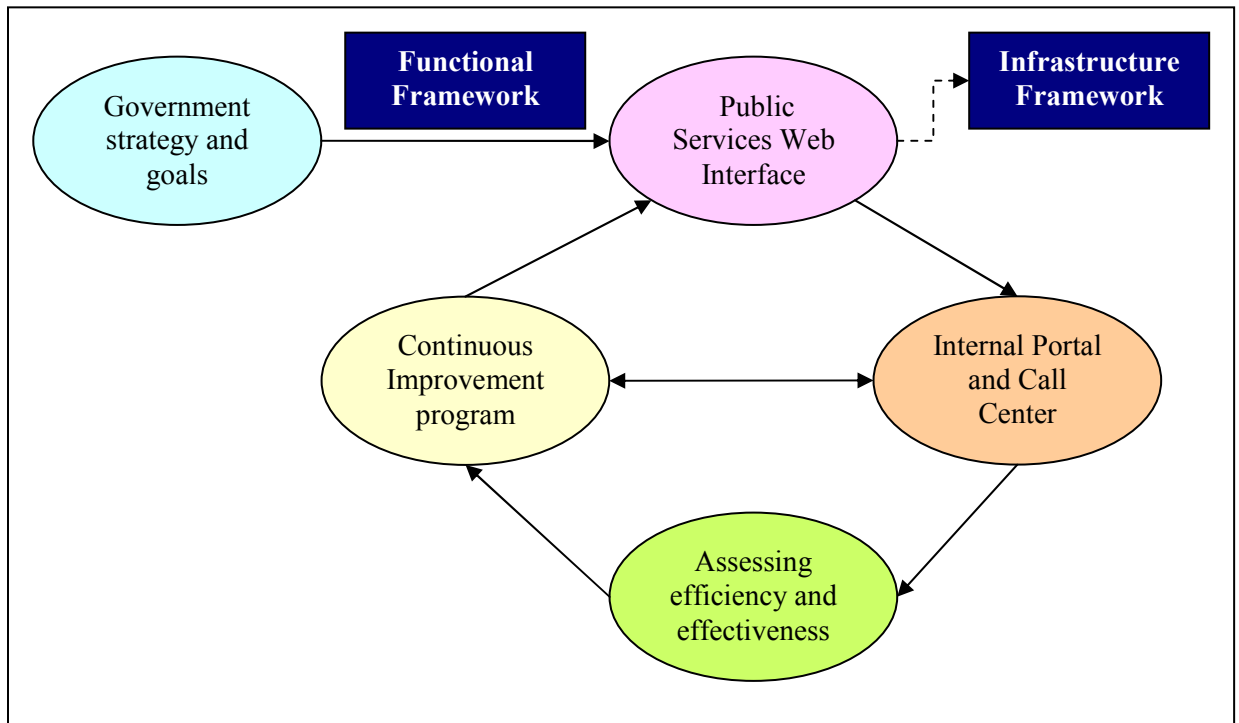


Figure 6.1: E-Government Implementation Framework

Each of these five elements can be explained further as sub-tasks that are described below.

Element	Description
Government strategy and goals	- Develop initial strategy for each initiative chosen to be implemented - Identify departments to lead the implementation - Gain management commitment - Identify policy amendments
Public Services Web Interface	- Develop project plan - Identify functional areas to target - Determine critical success factors - Develop implementation policies based on standards and regulations - Plan infrastructure requirement - Develop staffing and skills plan - Identify the need of procurement - Identify funding mechanisms for service delivery - Plan communications requirement - Identify risks and responses - Establish baseline performance through best practices review
Internal Portal and Call Center	- Procurement of services and infrastructure - Team development - Develop shared infrastructure and applications - Perform quality assurance - Information distribution
Assessing efficiency and effectiveness	- Measure performance of the critical success factors - Compare metrics against baseline – quality control - Report project progress - Monitor and control risks - Obtain feedback from users
Continuous improvement program	- Determine areas for improvement - Implement actions for improvement - Replicate knowledge

Figure 6.2: E-Government Implementation Framework elements

The first element is for the e-Government project committee to choose an initiative to be implemented and establish the strategy and goals that is aimed at accomplishing through this initiative. Next, the government agency that would lead this initiative is identified and agreed upon. The agreement or commitment gained from the chosen agency and governing body, acts as the “green-light” to go ahead with the implementation. With this, the project committee can begin to assess the policies that are dependent on the initiative. Policy amendments that are possibly required are highlighted.

Element two of the framework is where all the planning processes are placed. A project plan will be planned and documented by the project committee. Functional areas that will be targeted are identified. Critical success factors for this initiative are identified in order to maintain a focus on the objective and goals. Policies that were identified to be amended will be planned for according to relevant standards and regulations. New infrastructure that will be required are identified, planned for and scoped. With the policies in place, the project committee would now need to assess whether in-house skills and staffing resources are sufficient. Otherwise, alternatives such as short-term contracting and outsourcing would have to be selected. This is where procurement planning comes into place. Next, the e-Government funding body will be invoked for the budget necessary for the implementation. As shown in the value chain – in the literature review - there are various stakeholders involved in the e-Government implementation. Thus, the communication plan development is a very important aspect. Risks are also identified and remedial actions are suggested mainly with reference to experiences and best practices from other e-Governments. Most

information and baselines can be established through these historical documents and “reinvention of the wheel” can be reduced significantly.

In the third element of the framework, the project committee tenders for services and infrastructure. The team will have to go through normal contracting process for procurement. No matter in-house or short term contracting, the selected agency would have to develop a team that would be involved in the implementation and later operations of the implemented system. Thus, the framework acknowledges the need for team development activities. After the pre-work is done and the foundation is laid, the shared infrastructure and applications can be developed. Applications that are developed should be used by all agencies requiring it with minimal modifications. During the implementation, quality assurance processes will help to ensure that the final produced system meets standards and regulations identified earlier. Last but not least, relevant stakeholders will be kept up-to-date with the progress and other information deemed necessary.

Assessment of efficiency and effectiveness comes in the fourth element of the framework. In this element, project progress is evaluated against critical success factors. The project team also performs quality control in order to compare performance metrics against the established baseline. Project progress is reported to stakeholders where control points and the causes of differences are presented. During this stage also, risks are continuously monitored and controlled. After a successful rollout, user feedback should be collected and reviewed to assess the effectiveness of the system.

Finally the fifth element proposed in the framework was added where areas of improvement are determined mainly from stakeholder feedback and the quality control

process. Activities to improve the system become the fundamental for a continuous improvement program. Lessons learned are documented and stored for future access and the knowledge is replicated across other functional units.

6.4. Recommendations for Further Study

Over the period of conducting this research, the researcher found some limitations and has come up with recommendations for further study of the Malaysian e-Government.

- a) Metrics for performance measurements were not studied in this research. The benefits from each initiative that were rated by the respondents were based on their opinion and perception of benefit.
- b) Standing of the Malaysian e-Government is to be compared with more peer countries because this thesis only compared against Mexico, Germany and Taiwan. A wider view of comparison would result in a more accurate conclusion.
- c) Best practices that could be applied from other countries that are already soaring in the e-Government like Canada and Singapore needs to be highlighted. This would benefit emerging countries such as Malaysia and China and eliminates the need to reinvent the wheel.
- d) This research could be repeated every year in order to gather time based data (longitudinal study). For example the progress of the initiatives and its maturity level could be plotted against time to measure the progress year-to-year.

The framework that was proposed was not tested in this research. Thus a recommendation would be to conduct an experimental or pilot development approach to test the

implementation framework in selected government agencies that have a common data or metadata requirement.

LIST OF ABBREVIATIONS

3G	Third Generation Technology
BcN	Broadband Convergence Network
BOO	Build-Own-Operate
BOT	Build-Operate-Transfer
BTO	Build-Transfer-Operate
CoE	Center of Excellence
DMB	Digital Multimedia Broadcasting
e-GIF	Electronic Government Interoperability Framework
e-Government	Electronic Government
FY	Fiscal Year
G2B	Government-to-Business
G2C	Government-to-Citizen
G2G	Government-to-Government
g-Government	GIS/GPS applications
GIS	Geographical Information System
GPRS	General Packet Radio Service
GPS	Global Positioning System
IBM	International Business Machines
ICT	Information and Communications Technology
IT	Information Technology
MAMPU	Malaysian Administrative Modernization and Planning Unit
m-Government	Mobile Government
MMS	Multimedia Messaging Service
MSC	Multimedia Super Corridor
NBI	National Bureau of Investigation
NII	National Information Infrastructure
NKN-G	New Korea Net-Government
NLC	National League of Cities

OPEN	Online Procedures Enhancement for civil applications
PDA	Personal Digital Assistant
RFID	Radio-Frequency Identification
ROI	Return on Investments
SMS	Short Messaging Service
UN/ASPA	United Nation and American Society for Public Administration
WiMAX	Worldwide Interoperability for Microwave Access
WLAN	Wireless LAN

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APPENDIX A: Instructional Material for Public Agency

Professionals Survey

Target Sample: E-Government implementation team and MAMPU

Objectives:

- To highlight top goals of the e-Government initiative in Malaysia and its impact to improvement in public services
- To rate the benefits achieved to-date from the e-Government initiatives
- To find out the current standing of the Malaysian e-Government as compared to the rest of the world.

Instructions:

PART 1: Demographic information. Please tick the answer that best describes you or your organization.

Item	Response		
Organization Name and Address			
Level	Local ☐	State ☐	Federal ☐
Type of Services	Customer-facing ☐	Non customer-facing ☐	
Your role in this Organization	IT ☐	Business ☐	
Name*			
Contact*			
Designation			
Date			

Note: Your name is necessary only for the purposes of verification of the validity of the survey data collected. This information will not be used by the researcher to present the findings. All information provided will be treated with strict confidence by the researcher and will not be disclosed.

PART 2: Please read the statements below and indicate your opinion based on your experience by ticking a number between 1 and 5.

1 indicating 'Not Planned' (NP)

2 indicating 'Evaluation Phase' (EP)

3 indicating 'Pilot Phase' (PP)

4 indicating 'Started to Implement' (SI)

5 indicating 'Up and Running' (UP)

A	<i>Please identify the initiatives that government agencies have invested in over the past two years.</i>	1 NP	2 EP	3 PP	4 SI	5 UP
1	IT infrastructure/enterprise architecture					
2	e-Workplace/Intranets					
3	Strategic planning					
4	Strategic outsourcing					
5	Business case analysis					
6	Case management					
7	Portal					
8	Business process/organization change (without technology)					
9	Enterprise resource planning (ERP)					
10	Customer relationship management (CRM)					
11	e-Learning					
12	Others. Please specify :					

PART 3: Please read the statements below and indicate your opinion based on your experience by ticking a number on a scale between 1 and 5. Leave blank for a non-applicable criteria.

1 indicating 'Limited Benefits'

3 indicating 'Moderate Benefits'

5 indicating 'Significant Benefits'

A	<i>For each of the initiatives implemented, rate the level of benefits achieved.</i>	1	2	3	4	5
		<i>Limited----->Significant</i>				
1	IT infrastructure/enterprise architecture					
2	e-Workplace/Intranets					
3	Strategic planning					
4	Strategic outsourcing					
5	Business case analysis					
6	Case management					
7	Websites / Portal					
8	Business process/organization change (without technology)					
9	Enterprise resource planning (ERP)					
10	Customer relationship management (CRM)					
11	e-Learning					
12	Others. Please specify :					
B	<i>What is the level of impact of initiatives on efficiency and effectiveness?</i>	1	2	3	4	5
		<i>Limited----->Significant</i>				
1	Improved distribution of information and communication both internally and externally.					
2	Provided more efficient/effective customer service					
3	Improved services delivery/cycle time					
4	Analyze information to improve decision-making					

5	Improved employee cross-functional skills					
6	Improved employee productivity					
7	Reduced costs of providing services					
8	Reduced operational expenses					

APPENDIX B: Instructional Material for Public Agency

Executive Interview

Target Sample: Key decision makers in the government

Objectives:

- To find out common barriers (people, cultural, economical and organizational) in e-Government implementation
- To identify ways to overcome the challenges

Instructions:

PART 1: Demographic information. Please tick the answer that best describes you or your organization.

Item	Response		
Organization Name and Address			
Level	Local ☐	State ☐	Federal ☐
Type of Services	Customer-facing ☐	Non customer-facing ☐	
Your role in this Organization	IT ☐	Business ☐	
Name*			
Contact*			
Designation			
Date			

Note: *Your name is necessary only for the purposes of verification of the validity of the survey data collected. This information will not be used by the researcher to present the findings. All information provided will be treated with strict confidence by the researcher and will not be disclosed.*

PART 2: Please read the statements below and indicate your opinion based on your experience by ticking a number between 1 and 5.

1 indicating that you ‘Strongly Disagree’ (SD)

2 indicating ‘Circumstantial Disagreement’ (D)

3 indicating a ‘Neutral Effect’ (N)

4 indicating ‘Circumstantial Agreement’ (A)

5 indicating that you ‘Strongly Agree’ (SA)

	<i>What are the barriers that were encountered when implementing e-Government initiatives?</i>	1 SD	2 D	3 N	4 A	5 SA
1	Organization					
	a. Insufficient focus on change management					
	b. Changing scope of initiative					
	c. Insufficient involvement of customers					
	d. Value of initiative to customers not clear					
	e. Insufficient involvement of employees					
	f. Resistance to change					
	g. Lack of leadership support					
	h. Lack of employee skills					
	i. Limited knowledge transfer					
	j. Insufficient business case for initiative					
2	k. Process					
	l. Internal politics					
	m. Limited cross-agency collaboration					
	n. Lack of redefined business processes					
3	Technology					
	o. Lack of technology interoperability					
	p. Prevalence of proprietary systems					
	q. Conflicts with software providers					
	r. Technical complexity					
	s. What is the biggest challenge and how is					

	<i>What are the barriers that were encountered when implementing e-Government initiatives?</i>	1 SD	2 D	3 N	4 A	5 SA
	your department dealing with it?					

2) Do you think that in 10 years from now, e-Government will be the norm in Malaysia, and citizens get public service from the e-Government website, <http://www.gov.my/MyGov/Home?>
