Assessing Organizational E-Government Readiness of the Public Sector: A Saudi Arabian Context

This Thesis is Submitted in Fulfilment of the Requirements of the Degree of Doctor of Philosophy

By

AUTHOR: IBRAHIM A. ALGHAMDI
STUDENT ID: 2077614

SUPERVISORS:

DR ROBERT GOODWIN

DR GISELLE RAMPERSAD

SCHOOL OF COMPUTER SCIENCE, ENGINEERING AND MATHEMATICS

FLINDERS UNIVERSITY
AUSTRALIA

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Declaration

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

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Ibrahim A. Alghamdi

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Abstract

Information and Communication Technology (ICT) has become increasingly important in the development of nations. E-Government refers to the strategic use of ICT to transform the public sector. E-Government is regarded as a driver of citizen-centric, supportive, and advanced governance involving a transformation in how government re-engineers its internal processes and interacts with its stakeholders. Yet barriers can be encountered in the transformation to e-Government services due to limited readiness of a country's ICT infrastructure and deployment.

A review of the literature showed a lack of research in developing countries such as Saudi Arabia regarding e-Government, particularly pertaining to internal organisation factors. The majority of e-Government assessment models focus on the websites that offer service to the citizens. In addition, most existing models assess OEGR on a macro level (of the whole country) without performing an in-depth assessment at the micro level of public organisations. Consequently, an effective Organisational e-Government Readiness (OEGR) assessment model is essential for advancing appropriate e-Government implementation and transformation.

Given the significant investment in e-Government programmes and the need to allow such programmes to germinate, this study assessed OEGR in Saudi Arabia. Academic research on the main internal organisational factors leading to e Government readiness is still sparse. Few organisational e-Government studies incorporate pertinent value dimensions.

To address this gap in the literature, an organisational e-Readiness assessment model was developed and described in detail in this study. This OEGR model can be used by a range of stakeholders including information technology managers and policy makers in improving OEGR within the public sector and thus in improving the quality of public service delivery.

A model was developed comprising the effect of seven main constructs: strategy, user access, the national e-Government programme (Yesser), portal, processes, ICT infrastructure and human resources on OEGR. The model factors, relationships, and hypotheses stemmed from the literature on Information Systems (IS), Electronic Commerce (e-Commerce), Electronic Readiness (e-Readiness), and e-Government

readiness. To test the model, the research focused on examining the relationships and interactions among these factors in an organisational e-Government environment using a study comprising organisations associated with the government of Saudi Arabia. A qualitative method was employed for interviewing leading e-Government officials in Saudi Arabia. Quantitative data was also collected through a questionnaire distributed to a sample of top management ICT and e Government specialists in Saudi Arabia. Data obtained from the survey was triangulated with data gathered from interviews.

The qualitative findings confirmed the significance of each construct in influencing OEGR, and revealed certain issues specific for the Saudi Arabian implementation context. Quantitative findings revealed that strategy, Yesser, portal, processes, ICT infrastructure, and human resources had a positive impact on OEGR, while there was no direct link found between user access and OEGR.

The model provided in this study is a systematic approach to assess the OEGR of public organisations and to guide them in self-assessments. The thesis contributes to the literature pertaining to assessments of information systems and e-Commerce in general and e-Readiness and e-Government readiness in particular. Furthermore, it offers a valuable tool to government organisations for assessing their e-Government readiness and in assessing the success of e-Government transformation efforts.

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Abbreviations Used in This Study

ADF	Asymptotically Distribution-Free
ADSL	Asymmetric Digital Subscriber Line
AMOS	Analysis of MOment Structures
APEC	Asia-Pacific Economic Cooperation
ATMs	Automated Teller Machines
B2C	Business-to-Consumer
BPR	Business Process Re-engineering
CDG	Country Development Gateway
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CID	Center for International Development
CIDCM	Center for International Development and Conflict Management
CIO	Chief Information Officer
CRM	Customer Relationship Management
DBMS	Database Management System
EAI	Enterprise Application Integration
ECM	Enterprise Content Management
EDI	Electronic Data Interchange
EFA	Exploratory Factor Analysis
EGR	E-Government Readiness
ERP	Enterprise Resource Planning
G2B	Government-to-Businesses
G2C	Government-to-Citizens
G2E	Government-to-Employees
G2G	Government-to-Governments
GDP	Gross Domestic Product
GFI	Goodness-of-Fit Index
GIS	Geographic Information Systems
GSB	Government Service Bus
GSN	Government Security Network
ICDL	International Computer Driving Licence
ICT	Information and Communications Technology
IFI	Incremental-Fit Index
IS	Information Systems
ISP	Internet Service Provider

IT	Information Technology
ITPOSMO	Information, Technology, Processes, Objectives, Skills, Management systems, Other resources
ITU	International Telecommunication Union
KAM	Knowledge Assessment Methodology
KMO	Kaiser-Meyer-Olkin
KSA	Kingdom of Saudi Arabia
LAN	Local Area Network
MCIT	Ministry of Communication and Information Technology
METER	Measurement and Evaluation Tool for e-Government Readiness
ML	Maximum Likelihood
NRI	Network Readiness Index
OECD	Organisation for Economic Cooperation and Development
OEGR	Organisational e-Government Readiness
OLS	Ordinary Least Square
PC	Personal Computer
PDAs	Personal Digital Assistants
PKI	Public Key Infrastructure
RMSEA	Root Mean Square Error of Approximation
ROI	Return On Investment
SAMA	Saudi Arabian Monetary Agency
SD	Standard Deviation
SE	Standard Error
SEM	Structural Equation Modelling
SIS	Strategic Information System
SMEs	Small and Medium-sized Enterprises
SMS	Short Message Service
SOA	Service Oriented Architecture
SSO	Single Sign On
STOPE	Strategy, Technology, Organisation, People and Environment
TAM	Technology Acceptance Model
TLI	Tucker Lewis Index
UNPAN	United Nations Public Administration Network
USAID	U.S. Agency for International Development
VoIP	Voice over Internet Protocol
WAM	Web Assessment Method
WAN	Wide Area Network

WAP	Wireless Application Protocol
WITSA	World Information Technology and Services Alliance
WLS	Weighted Least Square

Publications From This Thesis Since Enrolment

Book Chapter

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Chapter 1: Introduction

1.1 Background to the Research

The growing power of ICT has influenced almost every aspect of people's lives. ICT has changed the way people communicate, learn, and interact with the private and public sectors. E-Government leverages the power of ICT to deliver quality government services throughout the country (Azab et al., 2009; OECD, 2002).

There are many definitions of e-Government. They all focus on two factors: the use of ICT by governments as a new way of delivering services, and providing government information that is citizen-centred. The World Bank's Web site defines e-Government as:

> The use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) [has] the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, and more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.

There is a growing understanding in the international development community that e-Government can foster good governance and promote the use of ICT in countries with economies in transition. Using technology to increase efficiency and accountability in government operations, enhance transparency and public participation, and raise human capabilities has been acknowledged by national representatives, the private sector and the civil society at large (ICEGD, 2002). In the same way, e-Government applications can offer substantial savings and increased revenue for government agencies, along with social benefits arising from government's capacity to use its resources more effectively (ICEGD, 2002).

The United Nations (2008) defines e-Government as government activities that take place over ICT among all categories of citizens, government, and businesses to

deliver e-Services, place and receive orders, exchange information, and complete financial transactions. E-Government is also defined as the government's use of any and all forms of ICT to improve the delivery of public information and services, involvement of citizens, and public participation (Curtin et al., 2003). Additionally, e-Government refers to the use of technology, and specifically the Internet, as a tool to achieve better government (OECD, 2003). While perceptions of e-Government vary widely, a more value-laden definition of e-Government is the use of ICT in improving the activities and services of government by making it more accessible, effective, and accountable (InfoDev, 2002; Heeks, 2006; 2010).

New ICTs have been introduced in the government sector worldwide in the past two decades in an attempt to achieve greater operational efficiency and effectiveness (O'Neill, 2009). The benefits of ICTs include streamlined administrative processing, lower transaction costs, better use of information resources, greater access to government information and services, and more opportunities for public participation in democratic processes (O'Neill, 2009).

In addition, measuring government systems' efficiency and performance parameters is important in this context. Many countries are enthusiastically introducing e-Government initiatives merely by observing others, but without analysing associated management issues (Bui et al., 2002; Curtain, 2004; PCIP, 2002; Wescott, 2007).

Comparisons between countries are difficult. Measurement criteria differ from country to country. Implementation and management processes may also be problematic. Questions emerge over whether e-Government solutions have been realistically designed, whether the country can adapt and diffuse e-Government, or whether the employees possess the required skills (Bui et al., 2002; Curtain, 2004; PCIP, 2002; Wescott, 2007).

Governments worldwide have invested heavily in ICT projects to stimulate economic growth (Rojko et al., 2011). ICT budgets have increased exponentially despite economic crises (Ojiako, 2012). Benefits such as improved service delivery, public administration, cost efficiency and transparency are anticipated through e-Government (Gonzalez, 2007; Nfuka and Rusu, 2007). However, the realisation of such benefits is still a contentious issue (Alshehri and Drew, 2010). Consequently,

there is a need for defining methods to verify the success of e-Government implementation (Andersen, 2010; 2012). Research is needed to guide the assessment of e-Government at the organisation level (Azab et al., 2009). The majority of existing models are more appropriate for assessing the overall implementation of e-Government at the country level, and are less able to evaluate internal factors at the organisational level in developing countries (Azab et al., 2009).

Therefore, it is essential to create an e-Government model that is applicable for public sector organisations. In contributing to this goal, this study first reviews the information system, e-Commerce and readiness literature in general and the e-Government readiness literature in particular. Due to the exploratory nature of this study in understanding the public sector perspective, it is based on in-depth interviews with leading e-Government officials in Saudi Arabia, followed by a more extensive survey with e-Government managers to confirm findings. The World Economic Forum Global IT report (WEF, 2011) recognised Saudi Arabia for its best practice in networked readiness, and also praised its development in e-Government and public sector transformation. Therefore, the context of Saudi Arabia offers valuable insights on the important drivers of e-Government readiness including strategy, user access, national e-Government programme, portal, business processes, ICT infrastructure, and human resources.

1.2 **Research Topic**

While macro factors may affect readiness for e-Government, a focus on government organisations is important. Readiness may be influenced by social, economic, health, education and national information policies (Caldow, 1991). However, this study does not focus on these macro factors. Rather, it adopts an e-Government model for highlighting the main internal factors of an organisation in the assessment of e-Government organisational readiness and how it can lead to successful organizational e-Government readiness (a new concept coined in this study and abbreviated as OEGR). The reality of e-Government has several dimensions. Every dimension requires leadership, cross-co-ordination and knowledge, all integrated with an information technology strategy to realise the vision (Bakry, 2004; Caldow, 1991).

The availability of a model for assessing OEGR in public sector organisations, particularly in developing countries, is crucial for developing effective e-Government strategies. Although there are many e-Readiness assessment tools, there are scant guidelines on how these tools can be employed in particular environments (ACM, 2008b). The design of e-Government readiness assessment models requires comprehensive assessment based on factors derived from information needs (ACM, 2008b; APEC, 2000; CID, 2002). Generally, these requirements must have advanced models which can be fulfilled by ICT factors collected from the essential set of assessment mechanisms (Bakry, 2004).

Reviewing the literature on information systems, e-Commerce, e-Readiness, and e-Government readiness confirms the need to fill a research gap by assessing specific internal factors from an organisational viewpoint which lead to OEGR. Most previous studies derive their assessment of OEGR from a macro or national level. Very few studies assess OEGR at the micro level of the organisation, especially in a developing country such as Saudi Arabia. Government organisations are not always considering internal factors affecting OEGR. Instead they are predominantly using tools from developed countries without validating their applicability to a developing context. Therefore, the research question of this study is:

> ***What are the key factors influencing organisational e-Government readiness (OEGR) within the Public sector in Saudi Arabia?***

1.3 **Country Profile**

Saudi Arabia is a nation worthy of study for several reasons: 1) it is the world's largest oil producer and has the fourth largest reserve of natural gas in the world; 2) it has 25% of the overall Arab Gross Domestic Product (GDP); 3) Saudi Arabia is the world's 25th largest exporter/importer; 4) the Saudi Stock Market has the highest market capitalisation in the Arab world; 5) local government has taken steps to advance the investment environment in the country to make it more attractive to national and foreign businesses (Khalid, 2006); and 6) most of the total labour market in the country is non-Saudi, reflecting the country's lack of local skilled people and professionals (Alshehri and Drew, 2010). In addition to its economic and

labour environment, the country is committed to developing its e-Government infrastructure (Alshehri and Drew, 2010; Al-Nuaim, 2011; Alotaib, 2013).

Saudi Arabia has embarked on an e-Government initiative to expand the digital economy for its citizens. It has taken steps to develop business processes and spread the concept of e-Services in different government organisations (Yesser, 2013). The Government of Saudi Arabia promotes the advantages that e-Government can provide to the national economy. For example, the supreme Royal Decree 7/B/33181, dated September 7, 2003 included a directive to the Ministry of Communications and Information Technology to prepare a national e-Government plan to provide electronic services and transactions reserves (Yesser, 2013).

To achieve these objectives, Saudi Arabia adopted a set of promising plans and strategies (Yesser, 2005). Transformation to an information society cannot be achieved without extensive collaboration and intensive attempts to implement the plan's objectives. Consequently, the Ministry of Communications and Information Technology (MCIT) established the e-Government Programme in 2005 in combination with the Ministry of Finance and the Communication and Information Technology Commission (Yesser, 2013). Yesser has undertaken the task of developing and implementing these plans and strategies in co-operation with public organisations.

Yesser aims to advance the development and performance of public sector employees and build the perception of e-Services in Saudi Arabian society. The vision of Saudi Arabia's e-Government initiative is to encourage government entities to implement e-Services for enhancing and serving the community (Yesser, 2013).

The main objectives of Yesser are to: 1) assist government agencies in providing better and easier-to-use services for individual and business customers; 2) encourage government agencies to work together in providing integrated electronic services with higher efficiency for individuals and businesses; 3) acknowledge and reward the extraordinary efforts provided by the e-Services and e-Government teams within government agencies; 4) encourage government agencies to participate in developing the national economy by providing more easier-to-use e-Services to businesses; and 5) support a culture of 'best standards and practices' and encourage government

agencies to adopt ‘top-standards’ in e-Services, and open doors to include the public in helping to design better e-Government services.

In order to achieve these objectives, the e-Government vision relies on formulating a Saudi Arabian e-Government strategy based on using ICT to improve government readiness.

Yesser created channels to facilitate this vision, which are the Government Security Network (GSN) and the Government Service Bus (GSB) in addition to the e-Government portal at http://www.saudi.gov.sa. IBM was chosen to be the implementer of the project. Some e-Services were integrated in the portal through the SADAD payment system, launched on October 3rd, 2004 (Yesser, 2013). SADAD was established by the Saudi Arabian Monetary Agency (SAMA) to be the national electronic bill presentment and payment service provider for the Saudi Arabia. The core mandate for SADAD is to facilitate and streamline bill payment transactions of end consumers through all channels of the Kingdom’s banks. Customers pay bills through SADAD using all available banking channels, including the bank branch, automatic teller machines (ATMs), online banking, phone banking, and Short Message Service (SMS).

However, the above objectives cannot be achieved without taking into account e-Government Readiness (EGR) on a macro level (i.e., of the entire country) as well as on a micro level. Evaluating the OEGR of public organisations assists in understanding the internal factors linked to each organisation that influences OEGR, which would contribute to achieving of e-Government in the public sector. The significance of internal factors is obvious, despite these organisations being affected by the same factors linked to the entire country. E-Government policy makers in Saudi Arabia have been concerned about assessing the country’s overall EGR since 2006; they have applied UN EGR criteria with ICT readiness initiatives in Saudi Arabia (Yesser, 2013).

The development of Saudi Arabia’s e-Government programme is a continuous process. The Kingdom of Saudi Arabia is now ranked third among Arab countries and has improved by 17 places to occupy 41st spot in the UN e-Government Readiness Index 2012. This demonstrates the country’s success in improving e-

Services and increasing broadband access, which reached 31% of users in 2013. In 2013, the MCIT reported that it expects to see a much higher demand for online services due to the growing number of Internet users. The population of Saudi Arabia is 27 million, with the number of Internet users growing from around one million in 2001 to an estimated 15.2 million by the end of September, 2012. Internet penetration increased to 52% of the population by the end of 2012, while fixed broadband penetration stood at around 36.4% of households. At the same time, the total number of mobile subscriptions grew to around 53.1 million, with penetration standing at 181.2%. Prepaid subscriptions constitute the majority (85%) of all mobile subscriptions. Total subscriptions to mobile broadband reached 11.73 million, representing a penetration percentage of 40% of the population (MCIT, 2013).

1.4 **Research Aims and Significance**

In deciding whether a government organisation is ICT ready, technical considerations are important such as technological directions and variety in technical solutions. Strategic e-Government readiness should be measured alongside identified goals. The organisation's technical capabilities should be checked to decide whether the existing ICT human resources are sufficient to accomplish the aims foreseen. In line with technical equipment, however, the role of the organizational strategy with clearly formulated e-Government goals and action plans, as well as the staff's subjective willingness and objective capability to transfer to e-Government operations acquire strategic importance when assessing OEGR as well.

The aim of this research is to provide an integrated model for assessing organisational readiness of e-Government that represents the association of relative components in a developing country's public sector and particularly in Saudi Arabia. To achieve the aim of this research, the researcher collected qualitative and quantitative data on both the factors that affect the OEGR in governmental institutions, and the current state of their impact on the OEGR. The preliminary literature review has shown what EGR factors are traditionally used globally for assessment of organizational readiness to a transition to advanced, ICT-mediated services' provision. On its basis, the set of factors was elicited and integrated into a

conceptual model tested first qualitatively and then quantitatively for the estimation of the strength of associations between those factors.

Overall, this study aims determine the internal factors of organisational e-Government Readiness and the relationships between them. This aim is achieved by meeting the following narrower objectives:

- Determine the critical success factors and variables for OEGR that assist in measuring each construct.
- Identify internal factors that affect OEGR in the public sector.
- Determine the role of strategy in the formation of the OEGR and its impact on other factors included into the OEGR assessment model.
- Develop a suitable research methodology for the empirical research of government organisations in Saudi Arabia in the form of an e-Government framework to assess OEGR of public sector organisations in Saudi Arabia.
- Carry out an empirical qualitative and quantitative assessment of OEGR measurement factors' propriety and strength of links.
- Propose an integrated model for assessing organisational readiness of e-Government specifically for developing countries' public sector.

The results of this research possess both practical and theoretical significance. First, the formulation of the OEGR assessment model will enhance the Saudi Arabia's government organisations and national e-Government programme by providing a strategic, technical, and theoretical framework for assessment and detection of weaknesses for taking action and promoting the transfer to viable e-Government structures. It will also provide managerial resources to the following groups:

- **Government officials**: Explore organisational barriers to transitioning to e-Government and examine critical success factors that may help government departments in overcoming these barriers.
- **Academics**: Move forward in the empirical research of development, diffusion, and transformation of public sector's governmental structures to e-Government. Academics engaged in researching e-Government may be interested in studying each

layer and its effects on different societies, as well as test the newly created OEGR model empirically.

- **ICT suppliers and companies responsible for e-Business**: Understand the current weaknesses in the crucial links between ICT and efficient e-Government services; comprehend the needed course of action related to the establishment of strong technical ICT facilities and infrastructure for ensuring an efficient transfer to e-Government.
- **ICT Specialists**: Help ICT specialists in the government sector understand how to utilise and manage information technologies to re-engineer business processes and create sustainable e-Government structures and services.

The most evident and significant contribution of this dissertation is the production of a new functionally viable and statistically tested model for OEGR assessment, as well as the formulation of the OEGR concept as such. Previous research utilizes the concept of –Government Readiness (EGR), but it is a much more general construct encompassing both external and internal assessment factors. The present work focuses on a fundamentally new research aspect in this field: Organizational EGR, which is the aspect of readiness preconditioned only by the impact of internal factors. Thus, it is a pioneering study in the field of assessing internal readiness of an organization, and the model designed and tested in it may become an instrument of further research in the defined field of interest.

This study will help government officials and ICT managers learn how to manage information technologies to re-engineer business processes, improve decision-making, and achieve a competitive advantage from the atransformation of e-Government. Moreover, this study will evaluate Saudi Arabian organisations' attempts to develop their e-Government infrastructure in order to provide adequate e-Services to stakeholders. More generally, the study promises to expand the currently existing body of knowledge in the field of e-Readiness, e-Government, and e-Commerce, informing these fields of activity and ensuring their smoother functioning.

1.5 **Research Contribution to Knowledge**

The advanced research processes led to the development of a methodical and practical model to assess the OEGR of the public sector. Even though more than two decades have passed since Miles argued in 1996 that ICT is a revolutionary technology which will swiftly advance e-Government transformation, there is still a gap in confirming this view (Al-Nuaim, 2011; Andersen and Henriksen, 2005; Cohen, 2004; Gronlund, 2005; Kahen, 1996; Norris and Lloyd, 2006; O'Neill, 2009). More analysis is needed on the impact of e-Government transformation in the public arena (Abdalla, 2006; Alshehri and Drew, 2010; Alshihi, 2005; Andersen and Henriksen, 2005; Bellamy and Taylor, 1994; Gronlund, 2005; Heeks, 2003; Hood, 1998; Kraemer and King, 2006; Norris and Lloyd, 2006; O'Neill, 2009; Rahman, 2007). There is a need to identify key issues around organisational strategy, user access, e-Government, implementation processes and information systems, identifying requirements of portal tools, ICT infrastructure, and human resources. Further research in this direction will improve knowledge by combining factors and variables from information systems, e-Commerce with e-Readiness, and e-Government models in order to provide a more comprehensive conceptual model.

Selecting Saudi Arabia for this study will help fill the gaps in the literature. Identifying these gaps has high relevance in the e-Government process from assessment, selection, and development to transformation. Furthermore, the OEGR model will reduce complexity surrounding e-Government strategy in the public sector through understanding the internal factors of OEGR. This study shall:

- Contribute to e-Government research in Saudi Arabia. Currently there is a lack of studies in Saudi Arabia regarding e-Government and particularly in public organisations particularly on the micro-level of a government organisation (Alshehri and Drew, 2010; Azab et al., 2009).
- Contribute to back office effectiveness. Existing studies have focused on the front user interface of Web sites. Lately, e-Government literature, such as Accenture (2007) and Azab et al. (2009), have noticed the importance of the back office and have called for more research on these broader organisational issues.

- Contribute by providing a new e-Government model for assessing OEGR and particularly in Saudi Arabia by covering e-Government user access, and e-Government programme readiness connecting to other mentioned dimensions.
- Contribute by assisting government decision makers in the public sector in Saudi Arabia undertaking assessment of OEGR (in contrast to e-Government programme evaluation reports) by highlight the role of strategy in OEGR.

1.6 **Thesis Layout**

This thesis consists of seven chapters. This chapter introduced the background of the research, e-Government readiness, research topic and question, country profile, aims and significance of the study, and research contribution to knowledge.

Chapter 2 provides an extensive review of literature relevant to the area of studies to determine dimensions affecting OEGR. It includes information systems success models, e-Commerce success models, e-Readiness success models, and e-Government readiness models. This chapter includes an important review of numerous publications covering e-Government concepts, organisation research approaches, as well as features affecting adoption and transformation of e-Government. In addition, the chapter reviews the e-Government-related literature published internationally and in Saudi Arabian organisations, including an in-depth review of the conceptual model of e-Government adoption and transformation-related studies. This chapter critically evaluates the extent to which factors related to the research problem have not been explored by previous researchers. It presents the development of a conceptual model and hypotheses based on the knowledge acquired from the literature review. The chapter also stresses the research question formulated as a response to the identified research gap.

Chapter 3 details the research method and design. It addresses the issues concerning the research approach, data collection strategies, study of Saudi Arabia, and data analysis techniques adopted, including qualitative and quantitative analysis.

Chapter 4 describes the processes of qualitative data analysis. It provides the findings of the qualitative data acquired from interviews which focused on strategies, motives and obstacles in the development of OEGR in Saudi Arabia from the decision

maker's and ICT specialist's perspective. This chapter also reveals the results of the qualitative data analysis incorporating various public organisations. It presents the development of a refinement of a conceptual model and hypothesis based on the knowledge acquired from the literature review and interviews.

Chapter 5 starts by presenting the findings of the descriptive analysis based on the data gathered from the questionnaire survey of Saudi Arabian organisations. The chapter describes the demography of the survey respondents, followed by the screening of survey data to ensure that it is suitable for the subsequent multivariate statistical analysis (i.e., Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and SEM. The chapter presents the analysis results of scale reliability, which assists in evaluating the internal consistency of the measurement scales used in the survey questionnaire. The EFA assists in discovering the suitable number of factors (i.e. factor structures) for each model construct, while the CFA confirmed the determined factor structures, which supports the validity of each construct. The chapter also provides results of the SEM technique used in the assessment process along with the pertinent analysis details and criteria. The model was refined and the results, concerning the confirmed causal paths connecting the constructs in the final model, are provided.

Chapter 6 discusses and summarises the key research findings. It discusses the relationships between the model constructs, and details the relationships for the main factors within these constructs. This chapter also compares the qualitative and quantitative findings of each construct in the study through the triangulation technique in order to represent the OEGR status of Saudi Arabia.

Finally, Chapter 7 highlights the study's contributions to the body of knowledge, and the implications for managerial practice in organisations in Saudi Arabia. It also explains the limitations of the study, and provides recommendations for future research.

Supplementary information (e.g. letter of introduction, consent form, interviews details, distributed survey questionnaire) is provided in the Appendices.

1.7 **Summary**

This chapter introduced the research topic of the thesis. The profile of the Saudi Arabia was reviewed. The research aims and significance were presented. The contribution of the research was discussed. The thesis layout was also highlighted. The next chapter contains a literature review incorporating relevant IS, e-Commerce, e-Readiness, and e-Government Readiness theories in addressing the research problem. Finally, the chapter will extract the main dimensions and factors from the literature to help develop an evaluation of an OEGR framework for the public sector.

Chapter 2: Literature Review

2.1 Overview

The present chapter is dedicated to the preliminary literature review regarding e-Government and e-Readiness as modern ICT-related service concepts, e-Government readiness models and functional elements, as well as benefits and goals that e-Government has in the 21st century for citizens, business, and public sector organizations. Section 2.2 of this chapter is fully dedicated to the analysis of e-Government, requirements for its establishment and existence, its goals and benefits, and functional elements. Section 2.3 deals specifically with the transfer to e-Government in developing countries and challenges they experience. Section 2.4 also contains data about the unique challenges and processes that the Saudi Arabian public sector experiences on the way to establishing e-Government. Section 2.5 is about e-Government readiness (EGR) assessment models and features, and it elicits factors dealing precisely with the OEGR, internal organizational readiness for e-Government. Section 2.6 presents the conceptual model for OEGR assessment designed on the basis of literature review findings, and an explanation of suggested links between its constituents. Finally, section 2.7 summarizes the chapter.

2.2 E-Government

From an academic viewpoint, e-Government has stemmed from research on the development and diffusion of ICT. ICT is recognised as a key driver of economic, social and environmental development in industrialised countries (Cohen, 2004; Dutton, 1996, Kahen, 1996; Snellen, 2007; Taylor, 2007). During the last two decades, the e-Government stream of research within the information systems literature has grown significantly (Andersen and Henriksen, 2005; Heeks, 2003; Thompson and Jones, 2008). Some authors have investigated the potential impacts of ICT and management issues (Bellamy and Taylor, 1994; Fountain, 2001; Heeks, 2010; O'Neill, 2009). Others have focused on ICT transfer, culture and country-specific factors in e-Government development and diffusion among stakeholders in developing countries (Abdalla, 2006; Alshihi, 2005; Heeks, 2010; Rahman, 2007).

2.2.1 E-Government as a Concept

E-Government as a concept emerged not long ago, with the increasing presence of ICT in various facets of human life (Yonazi, 2010). Therefore, there is no unified and universally accepted definition of e-Government to date. The most popular definition is that of the OECD (2003) categorizing e-Governments as internet service delivery, use of ICT within the government, and capacity to transform public administration by means of ICT use. An alternative, more specified definition was offered by Seifert (2003) who stated that e-Government is a government with a structure involving ICT, and especially the internet, with the purpose of improving the quality and speed of delivering government services to citizens, business, and other governmental bodies. Similarly, West (2004) defined e-Government as a structure that delivers information and services online through the Internet and other digital means.

Nevertheless, according to Macueve (2008), 'e-Government' is a term that refers to the use of new ICT by governments as applied to support a full range of their functioning, i.e., communicating, storing, processing, disseminating information, etc., with increased speed, accuracy, and reliability. A transfer to e-Government is associated with improved decision-making, productivity, and a greater competitive advantage of public sector organizations in the national and international market (WTO 1998).

There are many other definitions adding to the present-day understanding of what e-Government is, and what it does for the government and various stakeholders receiving its services. For instance, e-Government may be characterized as a way of enlarging the range and quality of public services to citizens and businesses, and at the same time increase the efficiency, accountability, and transparency of the government itself. Moreover, e-Government is a process of reforming the governmental activities, information sharing and delivery mechanisms, and servicing the government's internal and external clients (Yonazi, 2010).

Hence, in response to the increasing evidence about e-Government's benefits and positive impact on the provision of governmental services to citizens, the governments of many countries around the world have recently embarked on the implementation of e-Government initiatives to foster production, transmission, and information exchange among governmental agencies. Zeleti (2010) pointed out that

e-Government services may be categorized from the e-Business, citizen, knowledge, process, and tele-cooperation perspective, and each of these perspectives shapes the understanding of the current state of e-Government development in each particular country.

2.2.2 E-Readiness

The shortcoming of current e-Readiness assessment tools and studies is that they do not sufficiently cover factors relating to e-Government. They ignore essential components such as culture and technology acceptance by public officials (Alshihi, 2005), extent of ICT infrastructure in government organisations, strategies, or national e-Government programme architecture. Altman (2002) stated that there is no direct link between e-Readiness and e-Government implementation in a nation. However, Jansen (2005) recommends concentrating on the issues specific to e-Government when endeavouring to measure it.

Existing e-Readiness models focus on the private rather the public sector. Koh et al. (2007) assessed e-Readiness on three levels: strategic, system, and data, but not in a government context. Similarly, Haug et al. (2011) examined IT readiness in small and medium businesses and explored company, management and employee characteristics. The technology readiness index also focused on the private sector, examining dimensions of optimism, innovation, comfort level and sense of security in industries such as construction (Kuo, 2013; Parasuraman, 2000).

Some frameworks were developed for e-Readiness assessment in general and not particularly for assessing e-Government in a specific region or country. For example, Al-Osaimi's study (2007) in Saudi Arabia used an approach based on Bakry's (2004) framework for e-Readiness. It employed the Strategy, Technology, Organisation, People and Environment (STOPE) model for conducting e-Readiness assessments.

2.2.2.1 Factors Affecting E-Readiness

Government legacy systems and applications require upgrading to a Web-enabled level to enlarge their functionalities and achieve complete communication among all the information systems and their processes (Ebrahim and Irani, 2005). In addition, the integration of government database systems, processes and applications plays a significant role, because e-Government depends on data, systems and processes (Lee,

2010b). Eventually, these integrations achieve financial savings by reducing duplicate data collection, speeding up transactions, enhancing the reliability of outcomes, and boosting chances for cost-sharing with business (Lee, 2010b). These applications permit e-Government users to access information and other services using a single sign on (SSO) online portal.

Another factor that is emerging for e-Government readiness is strategy, although it has not yet gained prominence at the organizational level. Some studies stress that an ICT strategy is essential for the success of e-Government adoption and transformation (Alshehri and Drew, 2010; APEC, 2000; 2008, Bakry, 2004; Executive Office, 2002). However, it should be noted that these studies consider the strategy as an e-Government strategy, not as a government organisational strategy.

Strategy is important for organizations to adopt and to transform to e-Government. Alshehri's (2010) study indicated a need for a clear strategy in Saudi Arabia, otherwise work will lack direction and probably falter. The study's findings illustrate that more than 25% of participants emphasised the lack of a strategic plan as one of the important challenges to e-Government adoption and diffusion. The study revealed that it would help each government organisation to align its goals with the Yesser programme and develop its plans to adopt e-Government methods. Top management should take the responsibility to implement such plans and support all levels by providing sufficient resources to shape e-Government readiness within a set time frame aiming for the maximum performance of e-Services (Alshehri, 2010). The study also revealed a lack of IT professionals and training courses. More than 44% of participants indicated that there is a lack of IT professionals to direct e-Government readiness in their organisations due to a general lack of qualified IT employees in the public sector. Government salaries are lower than in the private sector. Furthermore, the study revealed that there is a lack of policy and regulation for e-Usage that covers all applications such as e-Payments, e-Mail usage, copyright rules, e-Crimes, e-Business and e-Commerce.

2.2.2.2 E-Readiness Models

E-Readiness tools cover both business environments and technology infrastructure. The Asia-Pacific Economic Cooperation (APEC) tool concentrates on government policies for e-Commerce, while Harvard University's tools focus on how ICTs are utilised in society (Bridges.org, 2001). The remainder of the e-Readiness tools were developed by enterprises or upon individual request to measure e-Econometrics and e-Society pointers. Measures of physical ICT infrastructure and education are popular factors in e-Readiness assessments tools. These tools provide parameters and factors not suited to assessing the comprehensive e-Readiness of organisations; most are focuses to political and economic surroundings rather than to organizational contexts (Rizk, 2004). Stephen et al. (2006) suggest a new e-Readiness integrated tool that highlights information access and also co-locates the different segments of ICT, human resources, and external readiness into one single tool.

E-Readiness models also take into account important factors of e-Government readiness in regard to the quality of ICT infrastructure, stakeholder's expectations, and advantages accomplished from ICT implementation (APEC, 2000; 2008). The United Nations Public Administration Network (UNPAN) appraised e-Readiness by developing a Measurement and Evaluation Tool for e-Government Readiness (METER) using a subjective combined index of Web site measurement, telecommunication infrastructure and human resource (United Nations, 2008).

E-Readiness tools such as Center for International Development and Conflict Management (CIDCM), International Telecommunication Union (ITU), and the World Information Technology and Services Alliance (WITSA) do not include e-Government in their assessments. Neither do other tools such as the Centre for International Development (CID) at Harvard University and IBM, the World Bank's Knowledge Assessment Methodology (KAM), the World Economic Forum's Network Readiness Index (NRI), nor the U.S. Agency for International Development (USAID) (bridges.org, 2005). These tools merely evaluate accessibility, support and usage of ICT in the government sector. According to Azab et al. (2009) these tools can be implemented with tools described in the e-Readiness literature such as APEC, CIDCM, and the Country Development Gateway (CDG). According to Azab et al.'s

2009 study that weighted the factors affecting e-Government readiness, IT strategy does not have a strong impact on e-Government readiness.

This led to discussion of associated models that evaluate e-Government strategy. It was important to carry out such a discussion to examine the appropriateness of models in assessing OEGR, and to discover their relative features.

Harvard CID (2000) developed a guide for developing countries in readiness for the networked world, which amended portions of Asia-Pacific Economic Cooperation. It comprises the following six indicators: 1) basic infrastructure and technology; 2) access to necessary services; 3) level and type of use of the Internet; 4) promotion and facilitation activities; 5) skills and human resources; and 6) positioning for the digital economy (APEC, 2000; 2008).

In contrast, bridges.org (2001; 2005) based an assessment model on the following criteria: number of users or computers, infrastructure, access, affordability, training, relevant content, poverty, IT sector geography, race, age, religion, gender, and disability.

Waseda University (2008) developed a model applied to 32 countries, which includes the following factors: IT infrastructure, online systems and applications, enterprise architecture, administrative, fund, Web sites, and planning and strategy.

The literature indicates that the above factors are vital in assessing an information system, but are still inadequate. Information systems involve the interaction between social and technical aspects, and are influenced by the organisational environment. Therefore, human sources should be included (Economist Intelligence Unit EIU, 2000; 2005).

EIU (2001) offers six categories for assessing a country's e-Readiness: 1) connectivity, 30%; 2) legal and regulatory environment, 15%; 3) business environment, 20%; 4) social and cultural infrastructure, 5%, 5) e-Commerce consumer and business adoption, 20%; 6) supporting e-Services, 10%. Later, EIU modified these weights to 20%, 20%, 15%, 15%, 25%, and 5% respectively (EIU, 2001; 2005).

Business Processes Reengineering (BPR) includes redesigning the workflow within or between departments to improve effectiveness (Alotaib, 2013; Molla and Licker,

2001; Lee, 2010b). ICT applications are significant in automating organisation services (AlMansoori, 2010).

Accenture is a global management, consulting, technology services, and outsourcing company, with 266,000 people serving clients in more than 120 countries (Accenture, 2005). It has published an annual e-Government assessment since 2000, and focuses primarily on clients from the public sector. This study uses Accenture's most advanced reports to discuss issues related to the research. In its 2005 report, the company ranked 22 countries based on two criteria, which are the maturity of the services provided on national government Web sites, and the level of governments in maintaining interaction with stakeholders. In 2006, Accenture performed an in-depth qualitative research by conducting interviews with e-Government policy makers. In its 2007 report Accenture included a third factor that takes into account citizens' feedback in the same countries studied to examine their opinion of the services provided to customers.

These reports helped in understanding e-Government assessment factors and in classifying the best practices derived from different countries (Accenture, 2007). In its 2012 report, Accenture revealed that approximately 44 per cent of 1,400 citizens surveyed in seven countries (Australia, France, Germany, India, Singapore, the United States and the United Kingdom) prefer interacting with their government e-Services because it is effortless, while nearly one-third (31 per cent) believe it is easier to access services from the government organisations than private companies. Citizens demand improved access to government services and tend to employ digital channels to perform routine government business. More than 70 per cent of the survey participants use the Internet for submitting and tracking government forms and payments, and more than half (53%) mention they plan to use more online channels in the future (Accenture, 2012).

Haug et al. (2011) explored IT readiness in small and medium enterprises and investigated company, management and employee characteristics. Similarly, Hanafizadeh et al.'s (2013) e-Readiness assessment model for informatics in SMEs was developed by reviewing the literature on e-Readiness assessment models of SMEs and the perceptions of ICT experts at informatics companies. This model is

adaptable to the social, economic and technological situations of the country (Hanafizadeh et al., 2013). The model comprises five factors, which are e-infrastructure, human resources, networked world enablers, networked applications and services, and the ICT sector and ICT goods trade. The findings of Hanafizadeh et al. (2013) indicate that SMEs have the highest readiness in e-Infrastructure and the lowest readiness in networked applications and services.

The presented evidence suggests that even though e-Government is only a part of e-Readiness, e-Readiness assessment models still do not reflect in-depth research into e-Government. They disregard important elements such as culture and technology acceptance by top management (Azab et al., 2009; Dada, 2006), quality of ICT in the public sector, and strategic alignment (Koh et al., 2007). Furthermore, e-Readiness measurement tools do not reflect the real e-Government situation: they exclude relevant factors that are hard to assess (Bannister, 2007). In investigating e-Government in Latin America, the results reveal that there is no direct link between e-Readiness and e-Government implementation in a country (Altman, 2002); this confirms Jansen's (2010) recommendation to concentrate on the most important factors of e-Government when endeavouring to assess it.

The above review indicated that currently existing e-Readiness models are insufficient for assessing OEGR, which led to the exploration of models developed specifically to evaluate it. However, e-Readiness assessments have important factors that can influence OEGR. Examples include the accessibility of e-Services, the level of ICT usage in the government sector, the level of interaction between stakeholders and government via Web sites, quality of ICT aspects such as technical, security and support, availability and integrity of the ICT systems, and quality of contents, application systems and e-Services. Also, processes dimension should include BPR to support processes, ICT application to automate processes and to enhance data and workflow.

2.2.3 Requirements for E-Government

Different literature sources indicate different requirements for the establishment of a sound e-Government structure. Explicit emphasis is usually made on the need for designing a strong information system (IS) on the technical basis of which the e-Government program may be established. Moreover, there is a necessity to design e-Commerce tools to enable customers of different categories to execute online operations that they used to execute manually. These major technical requirements for e-Government are reviewed in detail in this section.

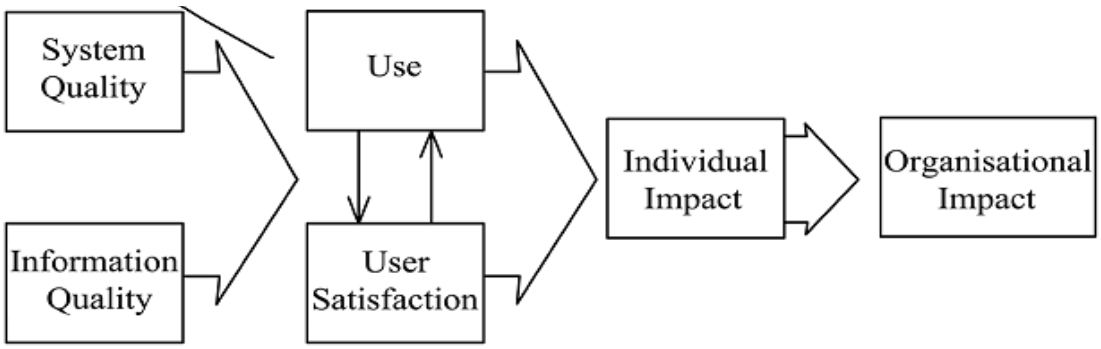
2.2.3.1 Strong IS

Measuring IS success is a challenge for researchers, due to the different factors depending on the viewpoint of assessment (Dörr et al., 2013). Therefore, a multidimensional IS success model is essential to involve all the stakeholders' perceptions (DeLone, 1992; Urbach et al., 2009). Within government organisations, ICT has been regarded as a tool to assist in delivering new and superior service (Homburg and Bekkers, 2002) through increased efficiency and accountability in public sector processes and procedures (Gupta and Jana, 2003). In reality, ICTs have become the solutions to enhance work procedures and advance information flows (Heeks, 2003).

E-Government initiatives rely on a mixture of political reforms and organisational changes to transformthe public sector (Cordella and Iannacci, 2010). To date, research in e-Government readiness has examined the role of ICT as an easy way to enhance organisational efficiency and advance internal workflow and management performance (Dunleavy, 2006). As a result, they underestimate the broader influence of e-Government policies on government organisations and the delivery channels of services (Dunleavy, 2006; Dawes, 2009). Much of the IS literature is based on private sector frameworks. For instance, when the different stages of e-Government projects are discussed, the similarities with private sector ICT models are marked. These stages, derived from Venkatraman's Business Process Re-engineering (BPR) model, primarily view ICT technology as providing enabling functions to work for government organisations (Venkatraman, 1994).

Many studies evaluated the e-Readiness of the public sector by using those studies that took into account the social, political and institutional dimensions of IS models (Ebrahim et al., 2006; Venkatraman, 1994). One of the most common studies is the technology enactment model which includes the influence of organisational and institutional arrangements (Fountain, 2001). It is considered as a useful model for ICT e-Government implementations (Azab et al., 2009; West, 2004). The technology enactment framework, deriving from literature on organisational theory, governance, and bureaucracy, provides a model to examine the associations between organisations and technology (Yildiz, 2007).

The attempts to improve IS models led to more focus on factors related to the object of study (Dörr et al., 2013). For instance, the DeLone and McLean's (1992) model is a significant contribution to the literature on IS success models since it proposes several measurement tools that offer alternatives to researchers. This is due to many studies being carried out to validate the model (Fraser and Salter, 1995, Rai, 2002).



Source: DeLone and McLean (1992)

Figure 2-1: Information system success

As one can see, this model consists of six interdependent variables that are theoretically integrated (see Figure). These variables are described below:

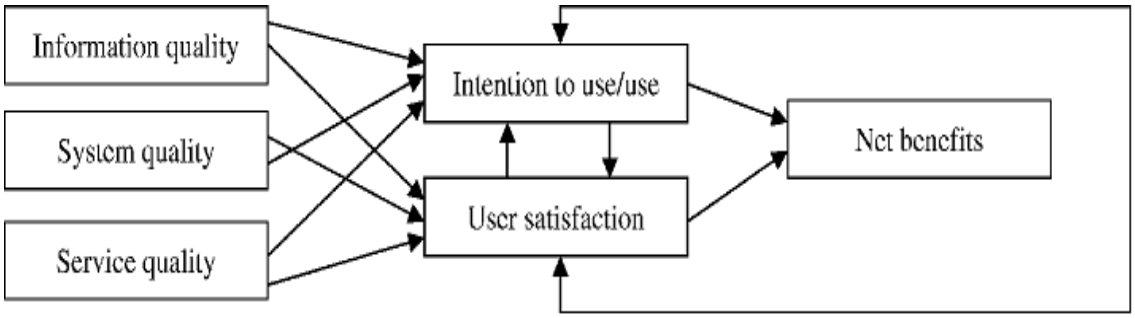
1) System quality: concerns the involvement of information systems of processing. This can be measured by convenience of access, flexibility of system, integration of systems, response time, realisation of user expectations, reliability, ease of use, ease of learning, and perceived usefulness.

2) Information quality: focuses on the quality of information created by the system. Suggested measurement tools are accuracy, timeliness, reliability, completeness, conciseness, and understandability.
3) Use: refers to the user's use of the output of an IS. This can be measured by use of different systems, frequency, and motivation.
4) User satisfaction: refers to user response to the output of an IS. The most important measurement tools are variation between information expected and information received, user complaints regarding information centre services, and user satisfaction relating to diverse facets of the IS.
5) Individual impact: concerning the impact of information on the recipients' manners. Main constructs are user confidence, proficient decisions, quality of decision analysis, quality of job plans, and expenditure awareness.
6) Organisational impact: refers to the impact of information on organisational performance. This can be measured by profitability, cost reduction, production scheduling costs, and market share.

The model has been used by many researchers as a base for proposing models for assessing information systems. For instance, Pitt et al. (1995) state that an IS assessment should consider the service quality as well, and not focus only on the product quality. Thus, service quality was used as an additional factor of information and system quality. Many studies revealed the significance of including a service quality measure as an element for measuring IS success (Kettinger, 1997; Wilkin, 2003). They confirm the value of diverse stakeholders assessing the quality of service as predictable.

The discussed IS success model was updated by the researchers in 2003, 11 years after its initial introduction. In their update, DeLone and McLean (2003) addressed additional significant constructs: System Use–Individual Impacts; System Quality–Individual Impacts; Information Quality–Individual Impacts (DeLone and McLean, 2003). All interdependencies have been confirmed except one, which is System Use–Organisational Revenues (DeLone and McLean, 2003). DeLone and McLean refute Seddon's criticism about the complexity of *Use* particularly for e-Commerce, where systems used by customers are necessary which clarifies the importance of use.

Besides organisational impact and individual impact, further entities could be affected by IS activities. Therefore, researchers suggested considering group impacts (Moeni and Lapointe, 2010), inter-organisational and industry impacts (Clemons and Row, 1993), consumer impacts (Brynjolfsson, 1996), and society impacts (Seddon, 1999). DeLone and McLean decided to combine all effects as net benefits rather than extend the model. Thus, the system characteristics were extended by service quality (DeLone and McLean, 2003). Figure 2 illustrates the updated DeLone and McLean success model.



Source: DeLone and McLean (2003)

Figure 22-2: Updated DeLone and McLean success model

In an endeavour to implement the DeLone and McLean model in assessing e-Government in Australia, Guo and Lu (2005) argue that a delivery channel such as a Web site between citizens and government organisations is fundamental. Therefore, they stress that when examining IS quality, the new construct, Web presence quality, should be added to the original two: information and system quality.

Yilidz's (2007) study reveals the complex actions that affect ICT technology implementation in the public sector. It emphasises how political agendas, organisational characteristics, and current management form the process of ICT implementation (Dörr et al., 2013). It is important also to provide flexible Service Oriented Architecture (SOA) solutions, as this can be beneficial for governing, integrating, deploying, securing, and managing services, irrespective of the platforms on which they were created (Behara et al., 2009; Oracle, 2010).

The above assessment factors are necessary in evaluating information systems. However, they are not enough. IS should be seen as a comprehensive socio-technical matter that is influenced by the organisational environment and human resources.

This is a move towards considering e-Government as a Strategic Information System (SIS) (Koh and Prybutok, 2002) that has the ability to transform relationships of government (Azab et al., 2009). Many researchers argue that SIS should be considered an organisational issue, not restricted to IS (Azab et al., 2009; Hufnagel, 1987; Segars and Grover, 1998). This confirms Heeks' (2003) ITPOSMO model that views e-Government features by measuring Information, Technology, Processes, Objectives, Skills, Management, and Other resources such as time and funding.

Understanding of the importance of IS systems in the development of proper e-solutions suggests a further need for assessing e-Commerce systems, as they are IS systems. E-Government services include provision of services that traditionally used to be paid for in banks or governmental subdivisions online. Hence, it was essential to carry out a review on commerce to explore the appropriateness of e-Commerce assessment models in assessing e-Government transition and OEGR in particular. Finally, it was important to reveal the features involved in the assessment of these models.

2.2.3.2 E-Commerce tools

E-Commerce refers to the purchase of products or services over telecommunications networks (Turban et al., 2002). E-Commerce developed into a global market when sellers sought new ways to offer their goods to customers (Grant and Chau, 2005; Kalakota and Whinston, 1997). Since the late 1990s, companies have been marketing their products over Web sites.

The most common e-Commerce model used to measure success is the DeLone and McLean model, which is considered a base for many studies (Barnes and Vidgen, 2002; Huizingh, 2000; Loiacono et al., 2000; 2002; Liu and Arnett, 2000; and Palmer, 2002; 2003, as cited in Azab, 2009). The model is effective because e-Commerce systems can be viewed as a category of information systems, and because the model has been investigated widely in IS literature. DeLone and McLean's (1992) model was extended by Molla and Licker (2001) to include all factors that relate to the marketing phases of e-Commerce. Molla and Licker (2001) changed user satisfaction to customer e-Commerce system satisfaction as an independent construct to gauge success. In addition, they replaced information

quality with content quality, and system quality with e-Commerce system quality as shown in Figure 2.

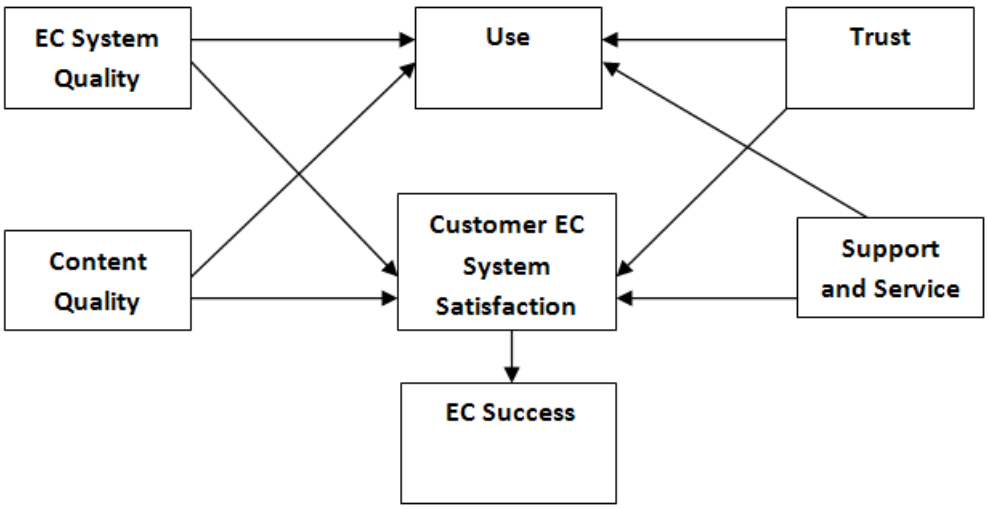


Figure 22-3: E-Commerce success model (Molla and Licker, 2001)

The Molla and Licker model excludes the organisational factor, due to e-Commerce users not being part of any organisation. The proposed model in this study cannot be as broad in assessing e-Commerce success as it focuses only on customers over the Internet.

In addition, researchers in Web presence assessment have taken into account revisions and extensions of presented models. Examples include ServQual (Parasuraman et al., 1988) and WebQual (Loiacono and Watson, 2000). An extended WebQual tool to evaluate online auctions includes seven factors: Web site navigation, Web site look and feel, information quality, trustworthiness, customer relationship, selling quality and buying quality (Barnes and Vidgen, 2001). The tool is remarkable due to lack of a representative sample (Alotaib, 2013). Barnes and Vidgen (2001) proposed a modified model of the WebQual method to assess bookstore Web sites by including the following factors: usability, design, information, trust and empathy. It confirmed that intuitively critical e-Commerce aspects are more important to customers than technical aspects (Alotaib, 2013). Derived from a ServQual scale, Long and McMellon (2004) proposed a model that comprises five factors to assess awareness of e-Service quality including tangibility, assurance, reliability, purchase process and responsiveness. In another study, Lin et

al. (2004) developed a Web assessment scale based on the ServQual scale to measure 70 Web sites in China. The scale comprises five main factors which are tangibles, reliability, responsiveness, assurance and empathy. Li and Suomi (2009) suggest five assessment factors to evaluate e-Service quality derived from the ServQual model including Web site design, reliability, fulfilment, security and responsiveness. In addition, Yang et al.'s (2004) study proposed an e-Service quality model consisting of six factors: reliability, responsiveness, competence, ease of use, security and product portfolio.

These e-Commerce assessment tools either integrated domain-specific factors or measured the diverse stages of the purchasing process (Alotaib, 2013). For instance, Schubert (2002) developed an extended version of the Web Assessment Method (WAM) (Selz and Schubert, 1997) which incorporates the technology acceptance model (TAM) (Davis, 1986). The revised WAM assessed the observed quality of commercial Web presence in two Business-to-Consumer (B2C) sectors: Electronic Retailing (e-Retailing) and online banking. The findings revealed that variables such as appearance, availability, interactivity, and trustworthiness of after-sales services and general Web presence were considered essential to customers in both sectors.

On the other hand, information quality was considered the most significant to e-Retailing users, while after-sales services were considered the most significant to online banking users. Therefore, Yang, Peterson and Cai (2003) proposed a context-specific scale that comprises fourteen factors representing forty-two variables in order to assess the quality of online shopping. The fourteen factors were: responsiveness, credibility, ease of use, reliability, convenience, communication, access, competence, courtesy, personalisation, continuous improvement, security/privacy, collaboration, and aesthetics. In addition, Tan and Tung (2003) developed a framework derived from TAM dimensions for designing successful Web sites with four key factors: perceived ease of use, perceived usefulness, perceived playfulness and attractiveness (Tan and Tung, 2003). Alotaibi (2013) proposed a Web Evaluation Instrument which consisted of six main factors: appearance, content, organisation, interaction, customer-focus, and assurance. Alotaibi's study thus contributed to the existing literature on e-Commerce, developing a Web evaluation instrument to assess the quality of commercial Web presence in Saudi Arabia.

These models can be categorised into three main factors: 1) e-Service environment refers to the physical platform of the services; 2) delivery of e-Services represents the communication process between the organisations and the consumers; and 3) the service product, which reflects the result of the service exchange. As a result this research collected data primarily from top management, e-Government committee members, and ICT professionals working in government organisations and not citizens. The abovementioned three factors can be assessed from the organisational management and technical viewpoint but not from user perception.

After reviewing the above studies, it was decided that the proposed measurement factors and criteria are limited to the assessment of Web site quality in a business-to-consumer model focused on online shopping processes and quality. There may be further measurement scales in other frameworks such as Huizingh's (2000), which incorporates business-to-business Web sites and states that online shopping is not the only reason for applying e-Commerce solutions.

Huizingh's model examines many factors linked to the organisation that transform to e-Commerce. These factors may be characteristics of the organisation, tools for implementing a Web site, Web site characteristics, and strategy to promote the site to match the organisation's marketing plan. Thus, it was necessary to include these factors in the study's proposed model due to their importance to the early stages of preparing an e-Government strategy. These factors will certainly contribute to the success of e-Government in any department.

Is it enough to evaluate e-Commerce success models by focusing on Web presence only? To answer this question, further research was conducted to learn what e-Commerce means to researchers.

There may be further assessment criteria in other contexts. For instance, differences between the public and private sectors have been identified in three categories: 1) environmental drivers and constraints; 2) organisational mandates and scope; and 3) internal processes, complexities, and incentives (Rainey et al., 1976). Private organisations often have advantages over governments in greater resources, less bureaucracy, and stronger incentives for creativity (Tan and Tung, 2003). In addition, the business models of e-Commerce and e-Government vary considerably in aims:

while the e-Commerce model aims at creating customer value and generating revenue, the e-Government model is based on providing citizens with government information and services, and also defining relationships and interoperation of government information systems (Li and Suomi, 2009). E-Commerce is not merely about selling products online. It comprises different processes that help provide e-Services on Web sites within each organisation (Zwass, 1996). E-Commerce requires an ICT dimension to operate e-Services via the value chain both internal and external to the organisation (Applegate et al., 1996). As a result, e-Commerce applications can be divided into three categories which are: inter-organisational (business-to-business); intra-organisational (within a business); and consumer-oriented (customer-to-business) (Kalakota and Whinston, 1997). A domain matrix developed by Riggins and Rhee (1998) classifies e-Commerce applications by two characteristics: the location of the application inside or outside the security system (firewall), and the type of relationship promoting the function of IT in improving relationships or producing new ones.

Redesigning business processes is important in identifying successful e-Commerce strategies and in assessing the quality of e-Services (Fassnacht and Koese, 2006). Although internal factors are significant in organisations, such factors are often disregarded (Elliot et al., 2000). The integration of e-Services with back office operations and with traditional information systems can cause security concerns, with concomitant high costs (Schubert, 2002).

Alotaibi's (2013) study contributed to the existing literature on ICT adoption in Saudi Arabia, as it identified the position of Saudi e-Commerce practices in contrast with international main players and regional practices.

2.2.4 Benefits and Goals of E-Government

While e-Commerce studies are relevant in the private sector context, in order to develop a relevant model for e-Government readiness, the unique goals of e-government should be considered. For instance, Yimbo (2011) associated e-Government with improved general compliance, citizen access, participation, and service integration. The World Bank (2005) defined the benefits of e-Government as follows:

"the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions."

Recent studies conducted in countries that already have a more or less rich history of e-Government's existence certify the increased citizen participation in decision-making, increased citizen satisfaction with governmental services and activities, and improved trust of citizens to the government. From the side of the government, accountability and cross-agency collaboration are increased. Moreover, citizens gain more access to information about performance of their governments and develop stronger relationships with them through a number of collaboration models such as government-to-citizen (G2C), government-to-business (G2B), government-to-government (G2G), government-to-employee (G2E), etc. (Yimbo, 2011).

Establishment of e-Government is generally defined as a positive move towards leveraging efficiency, effectiveness, and accountability of governmental and public sector organizations (Cordella, 2007). The creation of workable and efficient e-Government services contributes to the creation of improved practices in management of public finances, human resources, and service delivery. It is also potentially capable of giving improved access to high-quality public services, especially for vulnerable categories of population. E-Government can improve the investment climate by decreasing the regulatory burdens and transaction costs. Such improvements furthermore contribute to improvements in many other fields such as reduction of opportunities for corruption, improved decision-making, and promotion of ICT use in other sectors of any society (Yanazi, 2010).

Zeleti (2010) outlined the following benefits of e-Government for a wide range of categories of stakeholders:

- Quicker service delivery to citizens.
- Improved quality of service delivery.

- Reduced costs of government service utilization for customers and citizens.
- Increased accuracy and convenience of service delivery for citizens leading to increased comfort in service use.
- Ability to cope with larger volumes of inquiries within a short period of time.
- Less duplication of services and functions between public sector agencies and departments.
- Increased accuracy of records for citizens and governmental agencies.
- Reduced number of errors made by employees when processing citizen information and requests as compared to paper format.
- Enhanced governmental image and better relationships with citizens
- Lower costs and administrative size of the government.
- Smoother flow of information among governmental agencies, private sector organizations, and citizens.
- Efficient governmental processes.
- Shorter distance between citizens and their government.
- Better and more user-friendly business environment.
- Improved interoperability between service providers and customers.

E-Government implementation promises greater efficiency gains, making governance cheaper and quicker. Moreover, it ensures that the governance of a country implementing e-Government initiatives works better and more innovatively.

There are some specific benefits efficient e-Government offers to citizens, businesses, suppliers, and other business sectors. For citizens, e-Government provides a better and wider choice of channels, as well as convenient and short time of using governmental services. Citizens obtain better access and service availability of services that become cheaper and more personalized. At the same time, obvious benefits for citizens include greater awareness of the entire scope of services they may have from the government, thus ensuring their larger democratic participation (Fallahi, 2007; Lan, 2000).

In terms of benefits of e-Government for businesses, Fallahi (2007) underlined the emergence of quicker and faster business transactions and operations, as well as access to technology announcements. Businesses also obtain the possibility to decrease their transaction costs and time, and to obtain clear business regulations and policies. Enhanced security of conducting business operations online is also among the indisputable benefits of e-Government initiatives.

Suppliers of services obtain a range of benefits in the form of e-Procurement services that e-Government provides. They may gain benefits from the reduced transaction costs and reduced time needed for service and transaction processing. Other benefits encompass increased security of operations, increased inventory and customer management, and enhanced data sharing opportunities with customers and other suppliers (Zeleti, 2010).

Finally, a range of other public bodies is also likely to obtain a realm of benefits from the establishment of e-Government services and programs in any country. They obtain better and effective communication between departments and agencies, as well as a higher level of integration and coherence between local and central governments for enhanced policy-making (Fallahi, 2007). Moreover, e-Government promises higher levels of accuracy and efficiency, reduced transaction costs, and reduced effort required from employees to conduct regular public sector operations. The variety e-Government programs guarantees a quicker response to citizens, better use of organizational knowledge, as well as establishment of a flexible working environment (Lan, 2000).

2.2.5 Model, Stages, and Functional Elements of E-Government

In addition to consideration of e-Government goals, e-Government researchers have also examined various stages and functional elements of e-Government. The stage-based approach to e-Government envisions its establishment with various stages denoting the growth of governmental e-Services and e-facilities. Such an approach, according to Zeleti (2010), claims that the most evident variable against which e-Government implementation process may be assessed is the growth of government websites. According to this model, websites gradually and continuously grow from one stage to another, and improve capacity to deliver more services to citizens. There are different stage-based models speaking about a varying number of stages, such as,

for instance, the billboard (information) stage being the lowest stage of e-Government development, followed by the partial service delivery stage, the portal stage, and seamless (transformation) stage with the full integration of e-Services within a country's public sector. The ultimate stage of e-Government development is usually considered to be the interactive (e-governance) democracy stage signalling about the full and optimal development of the whole range of e-Services (Coursey and Norris, 2008).

Few studies on e-Government exist which can identify a linkage between functionality of organisation's IT applications and user access. The maturity model developed by Layne and Lee in (2001) has been quoted by a number of researchers. This model is based on found main stages including 1) the cultivation stage; 2) the extension stage; 3) the stage where the organisation matures and abandons the use of its intranet; and 4) the revolutionary phase characterised by data mobility across organisations, application mobility across vendors, and ownership to data transferred to customers (Andersen and Henriksen, 2006).

The maturity model has been extended by Andersen and Henriksen (2006) for e-Government stages in order to upgrade the employment of IT applications with external users such as citizens, businesses, and other agencies while accessing the organisation's applications. Yet they focus on the Internet only and ignore other important factors such as e-Government strategy. Andersen (2010) subsequently incorporated e-Government and Public Sector Process Rebuilding by providing an input to improve the processes in which the public sector interacts with citizens, companies, and elected decision-makers. It is essential for successful implementation of e-Government to stress challenges inhibiting digital transformation using activity and customer centric applications (Andersen, 2010). Sørum, Andersen and Vatrapu (2012) provided measurement of public Web sites and user satisfaction quality by an empirical study.

Another approach to considering e-Government models is that of functional elements each specific model encompasses. As pointed out by Yonazi (2010), major functional elements of e-Governments focus on three groups each characterized with specific features of service delivery. According to this approach, there are government-to-

citizens (G2C), government-to-businesses (G2B), and government-to-government (G2G) models of e-Government.

The G2C model of e-Government relates to non-commercial communication between local and central government sectors as well as recipients of governmental services. Consumers in this model are private individuals requiring a range of services and information from the government. Under the conditions of an effective G2C model establishment, governmental agencies are visible to citizens and actively provide them with services. Citizens are thus able to find and use a wide range of services for their benefit (Ndou, 2004; Sarpoulaki et al., 2008; Sharifi and Zarei, 2004).

A G2B e-Government model is also non-commercial, providing communication between local and central governmental agencies with the commercial business sectors. Such a model of e-collaboration provides governments with easier opportunities for doing business with the private sector. It also ensures collection of only relevant data and information, simplifying, smoothing, and speeding up the governmental interactions with businesses (Fallahi, 2007; Ghasemzadeh and Safari, 2002; Sharifi and Zarei, 2004).

The G2G model is also responsible for non-commercial interactions among a variety of government organizations and departments. The communication most often takes the form of electronic and IT administration's guidance and support for government departments, organizations, and authorities in their collaborative policy-making and decision-making processes. The benefit of G2G model's effective functioning is in the ability to improve programs and services delivery due to obtaining more accurate and relevant information through efficient interdepartmental cooperation (Sharifi and Zarei, 2004).

2.3 E-Government in Developing Countries

Taking into account the pervasive positive impact expected from the adoption of e-Government programs in any state, the implications for poor and developing countries are significant (Kumar and Best, 2006; Meso et al., 2004). However, there are many barriers to a transfer to e-Government and establishment of higher levels of

EGR in developing countries because their public sector institutions usually represent underdeveloped and under-financed organizations with poor access to information and characterized with ineffective service delivery. ICT introduction obviously promises to improve the way in which developing countries provide governmental service to their citizens by means of promoting their socio-economic progress, allowing democratic participation of citizens in the state's policy-making and decision-making processes, and the overall improvement of the nationwide communication infrastructure (Howard, 2007; Zeleti, 2010).

Unfortunately, research on the ICT development and EGR in developing countries is still scarce, mainly because of the lack of ICT equipment and connectivity in such geographical regions (Dada, 2006). Thus, the gap in ICT provision and development between advanced and developing economies continues to grow, with the use of ICT in the poor countries remaining alarmingly low. Developing countries often lack financial resources for the establishment of a nationwide information infrastructure, which hinders the creation of e-Government and delays the transition to ICT-led service delivery (Zeleti, 2010). Chen et al. (2006) also pointed out that barriers to e-Government in developing countries include the history and culture of certain nations, their technical staff availability, infrastructure, citizens' issues, and surely the commitment of government leadership to such innovations.

Notwithstanding the numerous barriers to ICT adoption in developing countries, the majority of researchers advocate efforts for e-Government creation in such countries. A transfer to e-Government even in poor and underdeveloped countries obviously promises a much higher quality of services, though it should be undertaken with due caution, in a citizen-adoptable way. Therefore, when considering the opportunity of establishing an e-Government initiative, authorities in developing countries should allocate effort and resources sensitively, with proper regard to the nation's understanding and acceptance of ICT and benefits it brings (Abu Nadi, 2012).

Another complication arises from the considerable digital divide between those having Internet access and those without access, which makes e-Government services available for only a portion of the nation. No matter how strange it sounds, a third of the globe's population of the 21st century have never made a single telephone call, while 63 countries of the present-day global map have only 1% of the

population with Internet access, as of the 2002 statistics (ICeGD, 2002). Therefore, e-Government initiatives should be preceded by intense efforts on increasing access to ICT, connectivity in distant and rural geographical regions, digital literacy among the population, and education about the benefits of transferring governmental services online.

Recent research evidence suggests that more attention is needed on ICT strategic development in the Middle East. This is echoed by Al-Solbi (2008) who argued that some of the interviewees in his study indicate that there is a lack of strategy and ICT project objectives. For instance, the Director of Technical Education in Gunfitha city in Saudi Arabia claimed that there were no projects with clear goals. He also indicated that the researchers have limited vision on how to develop ICT. Similarly, Zaied et al.'s (2007) study found that the participants' agreements regarding the appropriateness of the IT environment in public organisations in the State of Kuwait are 51.79% for human skills, 53.06% for infrastructure and 34.84% for connectivity. Thus, there is a need to conduct further investigation and cover further factors such as strategy (Zaied et al., 2007).

There are opportunities for expanding the relevance of e-Government readiness assessment tools and action plans. For instance, the following Millennium Development Goals were identified by the World Bank (2006): 1) begin with the goals; 2) link e-Readiness indicators with development goals; 3) be context-specific and think locally; 4) incorporate ICT approaches into sector-specific national policies like health and education; 5) focus at the micro level of economics as well as the macro; 6) emphasise regional co-operation and integration needs; 7) address negative effects ICT integration may have; and 8) be realistic.

Development of Web-based Government Information Systems can play an important role in improving OEGR. According to Mahrer and Brandtweiner (2004)**,** the lessons derived from their study can be grouped into the four key domains of Web-based Government Information Systems development: content and services; user interface; organisational integration; and IT infrastructure. The study also shows that IS failure models must be considered as concepts for practitioners when it comes to identifying obstacles in the development of Web-based Government Information Systems.

Existing e-Readiness tools fail to address the issue of information access (Stephen et al., 2006). A review of the e-Readiness assessment tools of organisations such as the Center for International Development - Harvard University and IBM (2007), McConnell International (2001), The United Nations Development Programme (2002) UN/DESA (2002) and UNCTD (2003) lists factors with value to information access.

There are several lessons to be learned on how to reform technical development and administration in government organisations (Jansen, 2011). The first lesson should focus on the history of the development, to show how every goal was connected to a political precedent. The second lesson can be achieved by building an infrastructure that enhances the reform processes. The third lesson is the awareness of the association between technical accomplishments, changes in legislation, and organisational developments. The classification of countries in Saghafi et al.'s (2011) suggested framework shows significant correlations between degrees of e-Government readiness and transparency, level of democratisation, and GDP.

2.4 E-Government Initiative in Saudi Arabia

The Saudi e-Government initiative is a rather recent undertaking that was initiated by the Saudi governmental authorities as a part of the national IT plan to reform the Saudi public agencies (Al-Shehry et al., 2006). Within this IT plan, the Saudi public sector institutions are urged to develop and establish strong and reliable ICT infrastructure that will assist in transforming the Saudi society into an electronic and information society, that is, into ICT- and knowledge-based society of the 21st century. The knowledge economy is one of the number one priorities in the Saudi Arabia development, and its core objectives include the transfer to knowledge production and exchange with the help of ICT to achieve a higher level of economic advantage (Webster, 2002).

To accomplish the aim of the transition to the knowledge-based society and economy, the Yesser national program was established as the first Saudi Arabia e-Government initiative in 2003. Though officially accepted in 2003, Yesser was implemented only in 2005. However, as noted by Bawazir (2006) and Al-Elaiwi (2006), Yesser was not the first effort of Saudi authorities to promote ICT adoption

in the Kingdom. One of the pioneering efforts in that context was the project Saudi Electronic Data Exchange (SaudiEDI) linking businesses and government agencies and established in 2001. Another effort was earlier undertaken by the Saudi Ministry of Labour to automate the labour information and employment processing systems, but that initiative failed because of the inability to provide timely and high-quality services to its stakeholders.

As it comes from the review above, the Saudi Arabia has had a number of attempts to initiate and sustain a transition to e-Government programs. Nevertheless, many of them failed to achieve the intended targets, which is also obvious about Yesser's efficiency nowadays. Numerous researchers tried to identify the reasons for Saudi failures on that way of that transition. For instance, Al-Elaiwi (2006) pointed out that the implementation of e-Government in the Saudi Arabia is challenged by the counter-productive management of processes, technologies, and people, as well as low awareness levels among governmental officials.

Nevertheless, even despite the fact that there is much criticism directed at the progress at which the Saudi Arabia government moves towards e-Government, some researchers still pointed out that notable progress on that way in certain aspects. Thus, Kostopoulos (2006) noted that the governmental site initially created for providing information to pilgrims quickly expanded to encompass a variety of other e-Services, now representing a major e-Government portal of the country. Alharbi (2006) also added that the e-Government's viability in the Saudi Arabia improved significantly over a short period of time, which suggested feasible positive improvements in the nest future as well.

It is notable that the establishment of effective e-Government initiatives in the Saudi Arabia is primarily concerned with the need to create higher levels of technological and ICT acceptance among the Saudi population. As pointed out by Sahraoui, Gharaibeh, and Al-Jboori (2006), the Saudi population is mostly conservative and unwilling to use ICT, and intense work on the integration of ICT into the daily lives and activities of Saudis was initiated by the Saudi Arabia government only recently. Since the end of the 1990s, the Saudi Arabia authorities have been improving the ICT infrastructure and telecom services' availability in Saudi Arabia. The government also launched the 'Home Personal Computers Initiative' in the early

2000s to provide more than one million computers for the Saudi population at discounted prices (Abanumy & Mayhew, 2005; Alsabti, 2005). Another initiative was the 'EasyNet' campaign providing simplified, cheap internet access to the nation. Such measures have obviously contributed to the significant improvement of connectivity, ICT awareness, and digital literacy among Saudis, but much more has to be done to transform the Saudi population into an ICT-savvy nation.

2.5 Assessment of E-Government Readiness (EGR)

Nowadays, there is a pronounced lack of comprehensive e-Government readiness assessment tools. This is not to say that there are no tools of such kind, but these tend to measure technical matters such as ICT connectivity, ICT use and integration, training, human capacity, government policies and regulations, infrastructure, security and economy. The literature has a predominant focus on technological issues such as portals, security and authentication, Web standards (Moon, 2002); interoperability (Millard, 2007); metadata, open source software, domain policy, connectivity (Reddick, 2005); procurement practices, project design (Gil-Garcia and Pardo, 2005; Martin and Bryne, 2003); and implementation issues (Heeks, 2006; Layne and Lee, 2001; O'Neill, 2009). Extant research predominantly focuses on issues of functionality (Layne and Lee, 2001; Millard, 2007) and technical aspects (Chen, 2002; Safai-Amin, 2002) of ICT in an e-Service delivery context. Yet there remains a considerable gap between what can be done using ICT and what has been achieved in reality (OECD, 2002; 2003). Many developing countries are finding it extremely difficult to divert scarce resources towards ICT-led development when faced with other priorities of reducing poverty or providing basic health and education. Lack of technical skills and policy building capacity are other barriers to establishing effective e-Government, e-Participation and e-Service delivery systems at the grass roots (Rahman, 2007).

Even if a technological focus is employed, a greater focus on technology assessment is necessary, because it is one reason why e-Government initiatives are often unsuccessful. Sometimes the technical system is never implemented, or the technology is discarded after implementation, or key goals are not achieved (relating to cost, implementation timeframes, and capability) or they result in unexpected

outcomes (Heeks, 2006). More than one-third of e-Government initiatives are overall failures (e.g. the failure of decision support systems in East Africa) (Heeks, 2003). An additional half can be viewed as limited failures (e.g. the limited or partial failure of management information systems in Eastern Europe); and approximately one seventh are successes (Heeks, 2003).

Furthermore, a number of other factors beyond the actual technology should be considered. The fundamental value of an e-Government organisational strategy, access channels, and national e-Government programme architecture should play an important role in e-Readiness assessments from an internal organisation perspective. It is also important to know how they are integrated with other dimensions such as business processes, ICT and human resources. A review of the literature shows that e-Readiness and e-Government studies do not take into account these dimensions in one model in sufficient depth, even though they are considered the main controlling competitive dimensions (Alghamdi, Goodwin and Rampersad, 2011, 2013, 2014).

2.5.1 EGR Models and Factors

The significance to public sector assessment of its readiness relies on evaluating its unique opportunities and challenges. For developing countries, an e-Readiness assessment can help establish benchmarks for regional comparison by market verticals and for national planning. While many models show a difference regarding objectives, methodologies and results, there is no comprehensive assessment model. In general, e-Readiness assessment models cover one or more of the following factors: ICT infrastructure (telecommunications infrastructure, Internet access, bandwidth, pricing, and reliability), ICT use levels throughout society including homes, businesses, schools, and government, human capacity (literacy, ICT skill levels, and job training), policy (the legal and regulatory environment affecting ICT sector and ICT use, including telecommunications policy, trade policy, taxation, service provisions, consumer protection, and privacy), and the ICT economy.

As a framework of OEGR and public management, e-Government is a relatively recent concept that emerged from a broader discussion on the ‘technical revolution’ around transforming the country (Gronlund, 2005). In this respect, it is somewhat undeveloped as an academic concept. Research pertaining to OEGR for e-

Government is embryonic. While the literature recognises the significance of e-Government readiness in organisations (Andersen and Henriksen, 2005), empirical work remains limited. E-Government literature focuses on technical capabilities and relations and their consequences for e-Services (Andersen, 2010; Andersen and Henriksen, 2005; Norris and Lloyd, 2006).

Extant research predominantly focuses on issues of functionality (Layne and Lee, 2001; Millard, 2007). The suggestion in this research is that we should avoid the maturity models in operational and technical interfacing only. As an alternative strategy, government use of ICT should be considered. Studies by Layne and Lee (2001), and their extension by Andersen (2010), focus on ICT application and user access.

Some research focused on the technical aspects (Chen, 2002; Safai-Amin, 2002) of ICT in an e-Service delivery context. Heeks (2003) measures e-Government features in his ITPOSMO model, and finds e-Government initiatives fail for any of the following reasons: the technical system is never implemented; the technology is discarded after implementation; key goals are not achieved (relating to cost, implementation timeframes, and capability) or they result in considerable unpredicted outcomes.

The e-Government architecture defines the standards, infrastructure components, applications, technologies, business model and guidelines for electronic commerce among and between organisations that facilitates the interaction of the government and promotes group productivity. (Ebrahim and Irani, 2005)

Because e-Government is a relatively new research area, its organisational portal architecture and adoption strategy have not been widely discussed in the literature. It has only been considered as national strategy by the CID at Harvard University (2010) and the Department's e-Government Framework (2010). Thus, this study will examine these theories from other significant areas such as organisational e-Government strategy, national e-Government programmes, business processes, and information systems integrated with other factors. Some studies have discussed the dimensions of e-Government (Cannice et al., 2003; Ebrahim and Irani, 2005; Gupta and Jana, 2003; Heeks, 2003; Office of the e-Envoy, 2003; Richard, 2001; ICT

Services Management Practitioner's Note: Enterprise Architecture, 2009). These studies did not focus on the components of organisational e-Government strategy and the national e-Government programme model from the organisation's perspective. Nor did they examine how this strategy is connected to the ICT readiness dimensions of access, portal architecture, business processes, ICT infrastructure, and human resources.

Creating national capacities for continuous e-Government assessment and building partnerships with key stakeholders is essential for ensuring ownership and commitment. The proposed OEGR assessment allows systematic adaptation to the local needs in developing countries and application to different levels of government. The component-based model provides significant flexibility in developing solid assessment instruments from existing components and customising these components to existing information requirements for strategic e-Government planning and enabling its implementation to best contribute to good governance (Center for International Development & Harvard University, 2010).

The components of the Department's e-Government Framework (2010) of organisational capability, enterprise architecture, and security and privacy represent the Department's organisational readiness to meet customer service requirements. The Customer Relationship Management (CRM) component is an indicator of the Department's customer awareness. The Department will address these components in an integrated manner. In addition, it will chart a forward course that matches organisational readiness to meet customer requirements. This component provides an integrated planning framework and a unified approach to developing and implementing security policies, procedures, and plans, including the analysis of threats and vulnerabilities, risk mitigation, and risk management. Security and privacy policies help create a secure and trusted environment for e-Government transactions (The Department's e-Government Framework, 2010).

Azab et al. (2009) also developed a framework to measure readiness of e-Government in Egypt. The suggested framework comprises four dimensions: strategy (goals, action plan and fund resourcing), processes (business process change, evaluation, use

and satisfaction) technology (IS structure, hardware and technical support), and people (user satisfaction, impact on employees and skills).

The developmental process is user-driven and involves participatory consultation through enterprise architecture focus group discussion, assessment surveys, process interviews, and agency units. The project is expected to develop the government agency's enterprise architecture methodology and the corresponding core reference models to improve the business process and strategic development of technology based services.

Siau and Long (2005) developed a new e-Government stage model, which consists of five stages: Web presence, interaction, transaction, transformation, and e-Democracy. However, the policy, implementation and privacy factors are different in e-Government, particularly when international motivators and restrictions are found across the complex framework of government (Belanger, 2006).

The Yesser e-Government programme has developed a general methodology to be performed by diverse stages of application where assessment of e-Government transformation is to be made (Yesser, 2005; 2013). The general framework of implementation upon which measurement was based is regulations of e-Government and appropriate resolutions issued to support the e-Transformation. The general framework for stages of e-Government implementation consists of four dimensions: integrity, improvement, e-Services, and infrastructure (Yesser, 2005; 2013). To implement these dimensions Yesser established Single Sign On (SSO), Government Service Bus (GSB) and Government Security Network (GSN).

The federal management in the USA offers the opportunity for e-Government functions to streamline activities such as policy making, programme, administration, compliance, enforcement, and internal operations and infrastructure. It can improve productivity by enabling agencies to focus on their core competencies and mission requirements. E-Government initiatives eliminate redundancy while improving service by simplifying processes and unifying agency islands of automation (Implementing the President's Management Agenda for e-Government, 2002; Delivery of Services to Citizens, 2002; 2003).

The progress of e-Government can be measured by three interrelated variables derived from terms suggested by Harvard CID (2002): 1) government effectiveness in promoting the use of ICT; 2) availability of online government services; and 3) extent of government Web sites.

Al-Nuaim (2011) developed a framework to evaluate e-Government in Saudi Arabia. It quantitatively assesses the stages of the Saudi Ministry's Web site and its problems. The study revealed that eight (41%) of 21 ministries did not employ the key features of an e-Government Web site. Moreover, 10 ministries (45.4%) were completely or partially in the first stage (Web presence); three ministries (13.6%) were in the second stage (one-way interaction); while six ministries had no online service at all. These findings demonstrate that the evaluated ministries were not citizen-centred and lacked e-Services, causing citizen disappointment (Al-Nuaim, 2011). However, this framework focused only on assessing organisations' Web sites.

After reviewing these e-Government models, it is clear that many focus on the front office and the use of e-Services by citizens and businesses. There are important factors should be considered from this review such as SSO, GSB and GSN for the national e-Government program also action plan and fund resourcing for the strategy, business process change for the processes, hardware and technical support for the ICT infrastructure, and resistance to change, user satisfaction, impact on employees and skills for the human resources. However, there is no consideration for streamlining back-office operations to help governments meet the challenges and opportunities provided by ICT.

To sum up, none of the aforementioned e-Government assessment models can be used to evaluate internal organisation readiness in the public sector because:

1) These models move toward e-Government at a macro or national level. A model is needed for the micro level.
2) The majority of the investigated research was theoretical and had narrow practical applications (Alsobhi, 2006).
3) Although Andersen and Henriksen (2005) and Andersen (2010) include significant information, it is primarily focused on technical and customer e-Service.

4) The models are only result-oriented and citizen-centred, and highlight the support of the e-Service factor, assessing only the organisation's portal to increase the quantity of e-Services provided. This misdirects assessment of e-Government.
5) Instead of focusing on internal and direct issues linked to e-Government and integrating them with other factors, these models only explore external factors such as citizens. This has already been investigated in e-Readiness assessments.
6) These models do not concentrate on all factors affecting OEGR in specific regions such as Saudi Arabia. Top management, e-Government committee members, and government ICT specialists are not thoroughly investigated.
7) These models do not investigate the ability of other employees using computers in the public sector. Nor do these models investigate factors linked to the ICT infrastructure—quality of hardware, software, connectivity, security and operation. The World Bank (2005) and Ziad et al. (2007) assessed only the number of computers in organisations and the speed of the network.
8) These models help in assessing back office management through issues; however, some questions remain. For example, is it possible to classify these issues into factors and variables? What is their interrelationship? Do they all have the same strength in influencing the government back office? (See Azab et al., 2009.)
9) Models such as Al-Nuaim (2011) only focus on Web site assessment.
10) Finally, UNDESA (2008) reports that more effort is required in assessing the ICT infrastructure and human resources.

The review of e-Government readiness models above led to the constructs included under each dimension in the suggested OEGR model. For instance, the factors related to the quality of technical elements such as hardware, software, connections, security and operations were included under the ICT infrastructure dimension. All factors should be considered by top management when preparing an e-Government strategy. Moreover, it is important to explore these factors from the management's and specialists' points of view to recognise the method that identifies e-Government and whether it influences their OEGR.

2.6 Proposed Conceptual Model for OEGR

After reviewing the above studies and models, this study concluded that the principle methods to evaluate information systems and e-Commerce success can be categorised into five factors: 1) stakeholders' awareness and expectations of the information system and delivery channels; 2) quality of contents, application systems, e-Services, and organisation's Web site; 3) availability and integrity of the information systems inside and outside other departments; 4) quality of ICT aspects such as technical, security and support; and 5) perceived advantages of implementing the information systems.

The above review confirmed that assessing e-Commerce success requires exploring internal factors related to the organisation that employs an e-Commerce solution. Such factors are not covered in the reviewed e-Commerce success models. However, these models have important success factors that can be applied to OEGR. This review revealed that no model can be entirely adopted to assess OEGR in the public context due to their focus on Web site measurement scales or related elements such as presence.

This review presented an important contribution to the development of the research model by considering those factors that should be included in the model. For instance, there is the importance of considering the Web site portal in the early stage of strategy preparation, the availability of technical features related to Web site quality, security and the integration between Web site e-Services through appropriate layered structure and the back office.

2.6.1 Conceptual Model's Design

The present literature review has shown that the majority of EGR assessment models use a comprehensive, multi-dimensional framework including both internal and external factors under which the e-Government readiness develops. However, the interest of this particular work is in the design of the OEGR model, eliciting only internal factors that affect the formation of e-Government readiness. The analysis of proposed EGR assessment methodologies has provided the following list of internal factors (in case external factors are sorted out):

Table 2-1: Internal factors of OEGR

Factor	Dimensions	Literature Sources
Strategy	operationalized in the variables of leadership, action plans, and development plans	Bakry (2004) – strategy is an important component of e-Readiness; Alshehri and Drew (2010), APEC (2008) – ICT strategy is essential for success of e-Government adoption; Lee (2010), Hair et al. (2010) – overarching influence of strategy on all OEGR components; Azab et al. (2009) – no sufficient level of OEGR can be achieved without a well-balanced and designed strategy; Haug et al. (2011), Lee (2010a) – essential impact of leadership on strategy formation in e-Government initiatives
User access	measured through stakeholder and delivery channel assessment	APEC (2008), Al-Nuaim (2011), Ebrahim and Irani (2005), Dawes (2009), Brannen (2001) – importance of easy access to services for population
E-Government programs	here, in the particular case of Saudi Arabia, the measurement variables include Yesser, GSN, and GSB	Yesser (2005; 2013), Almarabeh and Abuali (2010), OECD (2003), Chapell (2004) – the need for basing e-Government programs on SOA rules
Portals	operationalized in the form of availability, layered structure, and service-oriented architecture (SOA)	Oracle (2010), Yesser (2005), Molla and Licker (2001) – OEGR depends on the availability of high-quality portals; Al-Nuaim (2011), Stauffacher (2002) – opportunities and benefits provided by portals to e-Government programs; Alotaib (2013), Dörr et al. (2013), Maciaszek (2004) – importance of portals' availability and usability
Processes	evaluated from the viewpoint of support processes, process	Lee (2010b), Yesser (2005; 2013), Azab et al., (2009), Dörr et al., (2013), OECD, (2002) – e-Government's dependence on data,

	automation, and data and information flow	systems, and processes; Al Mansoori (2010), Sharif et al. (2005) – core role of processes in workable e-Government programs' creation
ICT infrastructure	assessed by means of focusing on hardware/software, connectivity, and security	Henriksen and Alshihi (2005), APEC (2008) – ICT as a key driver in the development of industrialized countries; Cohen (2004), Snellen (2007), Andersen and Henriksen (2008), Alshihi (2005) – pervasive impact of ICT in technological readiness for e-Government; EIU (2001) – connectivity indicative of the e-Readiness of a country
Human resources	embodied in the awareness, ICT skills, and training	Stephen et al. (2006) – e-Readiness integrates ICT and human resources; APEC (2008), Zaied et al. (2007), Azab et al. (2009), DeLone and McLean (2003), Molla and Licker (2001) – e-Government programs should be accompanied with HR evolution and training, ICT awareness increase, and training in ICT skills

This study suggested that the criteria to assess IS success can be classified into four categories: 1) stakeholders and delivery channels of the information system; 2) availability and quality of information, applications, services, and organisation's Web sites; 3) technology; and 4) management and awareness of using the information systems. In order to apply these categories, this study argues that an OEGR consists of seven dimensions (or constructs) as mentioned above.

Although no comprehensive OEGR model currently exist particularly in Saudi Arabia context, several factors have been recognized as important in achieving OEGR as indicated in Figure 2-4. These include strategy (leadership, action plan and development plan), user access (stakeholders and delivery channels), e-Government programme (Yesser) (availability, government security network and government service bus), portal (availability, layered structure and service oriented architecture), processes (support processes, processes automation and data and information flow),

ICT infrastructure (hardware and software, connectivity, security and operations) and human resources (awareness, ICT skills and training).

Figure 22-4: Initial Conceptual Model (developed for this research)

The researcher determined that factors under each category should be included to assess OEGR in government organisations. For example, the first category is related to the user access construct. As for the second category related to availability and quality, the researcher considered them in more than one dimension. Information, services, SOA and the Web sites were included under the portal dimension and applications included under the business processes construct. As for the third category, technology was included under the ICT infrastructure. The fourth category related to the management, impact on employees and awareness, which was concerned with the benefits to be realised from e-Government transformation, the researcher considered them for the proposed model in more than one dimension.

Such issues should be considered by top management when preparing an e-Government strategy, and should be regularly assessed. In addition, it is important to investigate these issues from the human resources' perspective to understand the way organisations could implement e-Government projects by having qualified and skilled employees.

2.6.2 Explanation of Variables and Hypotheses

There are several important dimensions to consider when assessing OEGR. The selection of dimensions or constructs for measurement should be based on the objectives of the assessment and the nature and demands of the projects prioritised for implementation. OEGR does not just cover the technical aspects; it also covers the process readiness and redesign potential. Measuring readiness at the dimension level is not enough; each dimension should be categorised into factors for scoring. Technical broadness empowers categorisation, as it is possible to subdivide each dimension into technical factors and indicators that shape the dimension's characteristics.

After reviewing and discussing information systems, e-Commerce, e-Readiness, and e-Government models, it is clear that they do not offer the ideal means to assess OEGR in the public sector in Saudi Arabia. As a result, research is needed to provide a comprehensive and integrated model that best assesses OEGR by encompassing all internal factors affecting e-Government within a public organisation as explained in the sections above. In order to involve these factors, the study proposes that an OEGR model consist of the following seven dimensions: 1) strategy; 2) user access; 3) portal; 4) e-Government programme; 5) business processes; 6) ICT infrastructure; and 7) human resources.

2.6.2.1 Strategy

The overarching role of strategy as a meta-concept affecting each factor of influence to the OEGR has been proven by many research findings, including Lee (2010), Microsoft (2010) best practices in ICT development, Hair et al. (2010), and the State Services Commission (2006). The State Services Commission defines e-Government strategy as "the all-of-government approach to transforming how agencies use technology to deliver services, provide information, and interact with people, as they

work to achieve the outcomes sought by government" (2006, pp. 2). Moreover, Lee (2010) underlined the need for a sound strategy as a key to effective e-Government implementation. Thus, a strategic plan for e-Government implementation serves as a strategic roadmap for any governmental agency on the way to transferring from its current state to its desired medium or long term future state. The pronounced lack of knowledge and skills needed for establishing and promoting e-Government was identified by Microsoft (2010) specialists in developing countries, which makes strategy the core of the presently designed conceptual model of OEGR assessment. Without a strategy, no sufficient OEGR can be achieved, which determines the need to focus on the strategy at the first stages of OEGR evaluations (Azab et al., 2009; Bakry, 2004; Yesser, 2005).

E-Government leadership can be strengthened by articulating a vision and objectives for the strategy to validate its costs and to verify the degree to which these objectives were accomplished (Alshehri and Drew, 2010; Haug et al., 2011; Lee, 2010a; World Bank, 2005). E-Government leadership can be included in the strategy to identify the vision and priority of e-Business, government support (plans, projects, funding, etc.) and the position of ICT managers with clear responsibilities (Bakry, 2004). Strategy should identify possible technological and legislative challenges (Azab et al., 2009; Bakry, 2004; World Bank, 2005). Forming a steering committee to control and monitor e-Government projects is essential for organisations to be successful (Bakry, 2004; Yesser, 2005). An e-Government strategy should align with the organisation's business and information systems strategy (Azab et al., 2009).

The strategy can involve an action plan that includes organisational attributes (accountability, structure, resource allocation, IT policies, BPR, and procedures) (Azab et al., 2009; Alshehri and Drew, 2010). An e-Government strategy should ensure that the action plan advances awareness and resource allocation for the organisation in order to provide e-Services (Azab et al., 2009). Governments may offer a suitable timeframe to implement plans with corresponding milestones (Azab et al., 2009; Bakry, 2004). The action plan may consider funding sources, and recognise the various e-Government stakeholders in order to verify their responsibilities and the significance to be placed on achievements (Azab et al., 2009; Forman and Thompson, 2007). The action plan can be an outline of all major

projects and steps to be taken within the government agency's e-Government initiative (Yesser, 2005).

Showing the value of organisational e-Government strategy along with its different underlying items led to the following hypothesis:

H1: Strategy positively influences OEGR.

2.6.2.2 User Access

Access channels are an important factor of e-Government and include the channels by which users can access the different government services (Alotaib, 2013; Ebrahim and Irani, 2005). Our study also uses access channels which comprise online and offline channels of delivery constructs through which products, services and information are utilised, accessed and communicated by various technologies such as Internet, ATMs, PCs, landlines, kiosks and mobile phones (Alotaib, 2013; Ebrahim and Irani, 2005; IDA, 2004).

Even in case an e-Government initiative is established effectively, it is of no use in case its core customers (such as individual citizens, businesses, and other public and private sector organizations) cannot access. Therefore, access channels are important for e-Government and refer to the means by which stakeholders can obtain government services (Al-Nuaim, 2011; Ebrahim and Irani, 2005). Despite the lack of agreement on the operationalization of user access, measures of e-Services delivery channels have been used in the ICT e-Readiness context, and hence will be adjusted and employed in this study. Based on the literature on IS success, e-Commerce and e-Readiness (e.g., Dawes, 2009; Dunleavy, 2006; Guo and Lu, 2005), two issues are considered to be associated with user access: stakeholders and delivery channels.

ICT has emerged as an intermediary in assisting communication between organisations and stakeholders (Abdalla, 2006; Dörr et al., 2013). While extant research focuses on functionality factors and e-Service delivery (Alotaib, 2013; Becker and Nowak, 2003; Carter and Belanger, 2005), little attention has been placed on the availability and accessibility of public e-Services from an organisational e-Government perspective as provided to stakeholders (Alsobhi et al., 2009; Al-Nuaim, 2011). E-Government needs to be driven by stakeholder demand, not just by cost

reduction. These stakeholder requirements include time savings, increased convenience, and accessibility (World Bank, 2005; Yesser, 2005). These requirements have affected the need to provide stakeholders with more extensive and effective e-Services for interacting with governments using Web-based systems (Alotaib, 2013; Brannen, 2001).

The user access channels dimension is considered the simplest level of an e-Government model, because it is directed, controlled, and supervised by government users. However, it is necessary for government organisations to offer a range of methods for finding information and services, preserving channel management, promoting views across diverse channels, and adhering to technical standards. The widespread use of mobile ICT such as laptops, mobile phones and PDAs has, along with e-Mail, SMS and other networking services, presented extra opportunities for the mobilisation of communication and interaction (Alotaib, 2013; Ebrahim and Irani, 2005; IDA, 2004). E-Government literature pays attention to the utilisation of the Internet to offer services to the public and transform the government electronically (Alotaib, 2013; Al-Kibsi et al., 2001; Fountain, 2001; Moon, 2002; Office of the e-Envoy, 2003).

The majority of assessments focus on the availability of ICT without putting it in the context of the local situation, which makes the full picture hard to observe and measure (World Bank, 2005). Only some studies count the number of people for whom ICT is completely unavailable, such as those in rural areas, which is another way to look at access to ICT (World Bank, 2005). Therefore, the present OEGR assessment model includes the factor of user access into the list of influences e-Government services implementation faces.

Highlighting the importance of user access as an integral factor in affecting e-Government directed the researcher to set the second hypothesis:

H2: User access positively influences OEGR.

2.6.2.3 E-Government programme

E-Government programmes ensure availability of digital data of different organisations being held in SSO Web portals. They aim to deliver interoperability

and integration of services among all government organisations (G2G), between government organisations and customers (G2C), between government organisations and business organisations (G2B), and between government organisations and their employees (G2E) (Yesser, 2005; 2013).

E-Government programmes attempt to achieve superior efficiency by raising the performance of services and transactions for users from various sectors of society with ease and professionalism (Almarabeh and Abuali, 2010). E-Services could include services such as rate paying, licensing, or information queries (Almarabeh and Abuali, 2010). Experts describe the national portal as 'a service transformation programme' because it serves as an umbrella for all government departments, authorities, and administrations. The e-Government programme can lead to increased effectiveness in delivering services through multiple delivery channels (AlMansoori, 2010; Alshehri and Drew, 2010). The e-Government programme can be designed to raise the public sector's productivity, prove better and easier-to-use services for customers, increase return on investment (ROI), and provide information in a timely and accurate fashion (OECD, 2003; Yesser, 2005).

From a portal management viewpoint, it is essential to offer stable SSO interfaces to expand user access and control—for instance, using authorised e-Services, search capabilities, and instant messaging. Security is another key element of this dimension, through connecting to a GSN as well as through an e-Government portal so that organisations can support protected transactions. There is also a need for compatible systems for linking tools such as the government service bus, which can be available on national portals to register, identify, and categorise users, and provide them with the ability to access specific applications and information. The model proposed in this study comprises three factors under the national e-Government programme: availability of a national e-Government portal, GSN, and GSB, to help assess the organisational portal readiness that links to the e-Government portal. More details on these factors are provided in the next three sections.

There are three e-Government programmes in Saudi Arabia considered in this dissertation and reviewed under the "e-Government programme" factor of the proposed model: Yesser, GSN, and GSB. They represent three pillars on which the

Saudi transition to e-Government relies. However, there is a lack of co-ordination from Yesser to allow organisations to connect with the system through the GSN or GSB (Alshehri and Drew, 2010). In addition, there is a clash of responsibilities between Yesser and Al Elm Security Company that could delay providing integrated e-Services via the organisational and national portal (Alshehri and Drew, 2010).

The GSN is important in providing a communications network specifically for electronic government transactions. It links government agencies to the e-Government data centre, which can be established with the highest technical specifications and security for hosting the gateway for national electronic services, and as a host site for e-Government programme (Yesser, 2005; 2013) (see Figure 2-5). The GSN facilitates the e-Government programme becoming a key connection point among organisations in a secure and cost-effective manner.

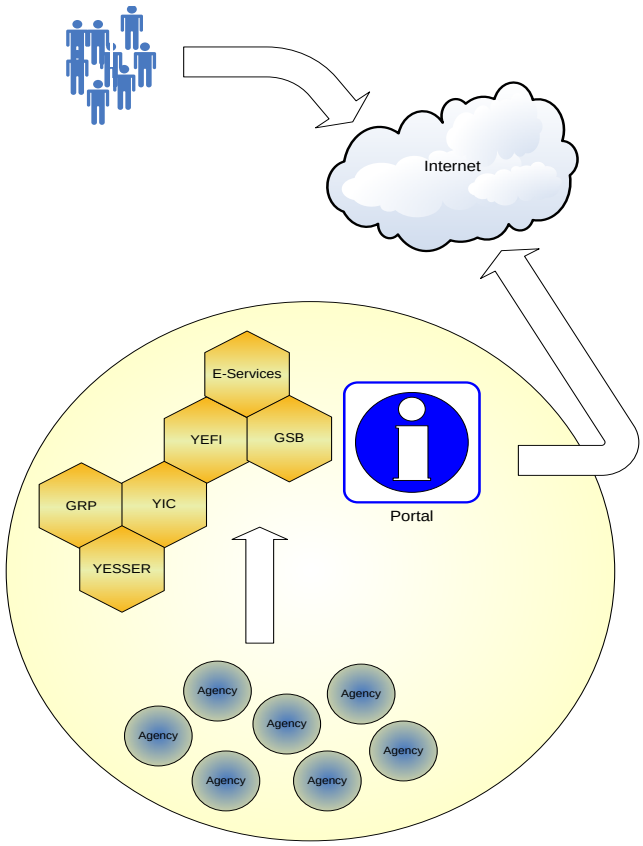


Figure 22-5: Government security network (Yesser, MCIT)

The mediating role of strategy is again felt in the field of e-Government programme consideration, since it should ensure the integrity and compatibility of organisations' ICT systems with the national e-Government programme (Yesser, 2005). The GSB

can be the middle platform of integration and services for e-Services and transactions, and can offer frequent common services such as identity management, e-Payment, and core data exchange through the e-Government portal as shown in Figure 2-6 (Yesser, 2005). This new generation of integration launches ready-made codes using open standard, messaging, and freely joined service oriented architecture (SOA) rules (Chappell, 2004). Organisations can apply the solutions necessary for a quick win phase, enabling the provision of e-Services from different agencies to use a common infrastructure for centralised shared services through the GSB.

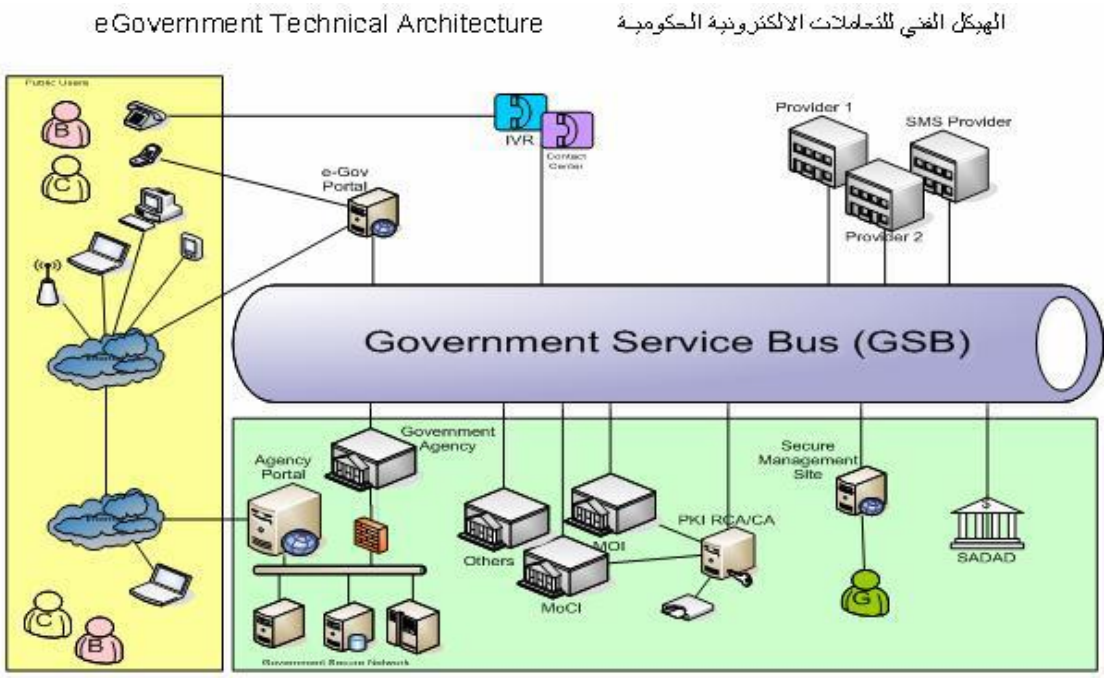


Figure 22-6: GSB's role in e-Government services infrastructure (Yesser, MCIT)

The literature revealed three major constructs to measure organisational integrity readiness with the e-Government programme, including availability of a national e-Government portal, including SSO, GSB, and GSN (Yesser, 2005; 2013). GSN is important in providing a secured communications network specifically for electronic government transactions. Finally, a GSB should be the middle platform of integration, and should offer frequent services such as identity management, e-Payment and core data exchange (Yesser, 2005; 2013). Therefore, the OEGR model proposed in this study encompasses Yesser, GSB, and GSN measurements as the indicators of e-Government implementation success.

Highlighting the importance of the national e-Government programme as an integral factor in affecting OEGR directed the researcher to set the third hypothesis:

H3: e-Government programme positively influences OEGR.

2.6.2.4 Portal

The present literature review has shown that factors helping the assessment of technical architecture readiness include availability of high-quality portals, layered structures, and SOA, which are described in the following sections (Oracle, 2010; Yesser, 2005). Therefore, this study utilises portal as the fundamental technological architecture of an e-Government portal. E-Government portals allow governments to extend services to citizens, other government agencies, businesses, and employees, integrated as a single unit (Al-Nuaim, 2011; Stauffacher, 2002). In portal architecture, usability are critical for success (Dörr et al., 2013; Maheshwari et al., 2009; Lee, 2010b). The availability and quality of the portal is important in government transformation, by fulfilling the need for interactions, transactions across multiple agencies, and the ability to deal with different kinds of databases.

Portal availability refers to the types, levels, and number of services provided through a public-sector portal (Alotaib, 2013; Maheshwari et al., 2009). Availability is important for a portal to provide a high level of usability, content, layout, navigation, consistency, and updates (Al-Nuaim, 2011; Alotaib, 2013; Dörr et al., 2013; Maciaszek, 2004). A government organisation's portal must be ready to offer access to all back-end services from delivery channels, meet diverse back-office needs, cater for varying levels of technology, handle digital authorisation, and manage increased levels of traffic (Accenture, 2004; Al-Nuaim, 2011; Deloitte Research, 2000) . The portal's existence affects e-Readiness perception.

Layered structures are commonly used in architectural design. They permit the grouping of systems into a hierarchy and reduce package combination (Maciaszek, 2004). A layered structure has three layers: a presentation layer (including existing portal solutions); a middle layer/layer domain (including sepal-rated logic of business and support applications); and a back-office/foundation layer (including databases and Web services) (Maciaszek, 2004). These layers reflect the portal design (Molla and Licker, 2001), which can be assessed for the readiness of

performance through the reputation of the operating systems, the reputation of the software development technology, communication standards used, and infrastructure connectivity speed (Accenture, 2004; Al-Nuaim, 2011; Deloitte Research, 2000; Zaied et al., 2007).

An SOA approach to e-Government supports ICT with service delivery objectives and allows different government agencies to reprocess developed assets (Behara et al., 2009; Oracle, 2010). It is useful to offer flexible SOA solutions, as this can be beneficial for governing, integrating, deploying, securing, and managing services, irrespective of the platforms on which they were created (Behara et al., 2009; Oracle, 2010). SOA alleviates the dependency on back-end applications and reduces the requirement to write code every time there is a change in policy, because it can deal with different platforms and advance direct collaboration between users irrespective of the delivery model (Behara et al., 2009; Oracle, 2010). Furthermore, various interfaces between applications and/or databases follow principles of service orientation (Oracle, 2010).

The effect of portal architecture on OEGR led to the fourth hypothesis:

H4: An organisation's portal positively influences OEGR.

2.6.2.5 Processes

The literature review conducted in this chapter showed that processes are at the core of any e-Government programme implementation, so they should obviously be included into the OEGR assessment model. Insertion of BPR (Lee, 2010b), together with motives, processes, integrity, streamlining, and applications/systems to confirm ICT development effects (Alotaib, 2013; Molla and Licker, 2001; Lee, 2010b), are strongly recommended by prior research. Findings from the studies of Al Mansoori (2010), Sharif et al. (2005), Themistocleous and Irani (2002), Samtani and Sadhwani (2002), Huang et al. (2002), and many other researchers have illustrated the role of various ICT processes in the establishment of workable core business applications, enterprise resource planning (ERP), creation of web services, facilitation of electronic data interchange (EDI), customer relationship management (CRM), etc. Consequently, the factor of processes is considered vital in the process of OEGR assessment.

Business process systems involve collaboration between business and ICT management to define, accept, and communicate the BPR for all service procedures workflow, documentation and collaboration, to understand the incorporated modification of the business through the ICT-supported information systems (Azab et al., 2009; Dörr et al., 2013; OECD, 2002). However, the current e-Readiness tools are inadequate in addressing the issue of information content and ease of access (DeLone and McLean, 2003; Stephen et al., 2006; Molla and Licker, 2001). Therefore, this study focuses on the three factors of processes construct found in the literature review on IS success, e-Government and e-Readiness including support processes, process automation, and data flow.

Highlighting the importance of processes as an integral factor in affecting e-Government directed the researcher to set the fifth hypothesis:

H5: Processes positively influences OEGR.

2.6.2.6 ICT Infrastructure

The dimension of ICT infrastructure has been a core issue for many researchers. Though major emphasis was traditionally made on the technology component of ICT, the full ICT infrastructure commonly relies on service-oriented architecture (SOA) and strong connectivity (Bakry, 2004; Center for International Development - Harvard University and IBM, 2007). Having a successful e-Government strategy means that governments establish a suitable infrastructure to support information systems and applications (Bakry, 2004; Center for International Development - Harvard University and IBM, 2007). Many countries fail when implementing ICT projects because of an inability to establish a suitable ICT infrastructure. The digital divide between richer countries and developing ones is large (World Bank, 2006).

The present literature review, particularly the CID's (2007) and World Bank's (2006) experience with ICT infrastructure design and implementation, have informed the formulation of the ICT infrastructure factor as a group of shared, physical ICT resources that can facilitate existing and future business applications. These resources include: 1) hardware and software (e.g., operating systems); 2) connectivity; 3) security; and 4) operations. An e-Government's ICT infrastructure might include some technologies with network infrastructure at its origin, containing

hardware (Web servers, application servers, storage devices, PCs, printers, scanners, routers, switches, firewalls), and software (operating systems and application development tools) (IBM, 2011; Macasio, 2009a). These technologies, with high level of hardware and software standards, work through professional network connectivity that advance communication and information transmission within and between organisations online (CID, 2007; Ebrahim and Irani, 2005; HP, 2012).

ICT software helps in ensuring the systems reliability, ease of use, accessibility, usefulness and flexibility (CID, 2007; Ebrahim et al., 2006; IBM, 2011; World Bank, 2006). Connectivity offers the necessary technologies, such as local area networks (LANs) and wide area networks (WANs). WAN uses existing technology to connect local computer networks into a larger network that may cover both national and international locations (IBM, 2011; Macasio, 2009a; World Bank, 2006). Security must integrate technologies such as public key infrastructure (PKI), firewalls, biometrics, digital signatures and certificates, and sophisticated encryption techniques to protect all levels of the government ICT infrastructure (Conklin et al., 2004; Ebrahim and Irani, 2005; Pfleeger and Pfleeger, 2003).

The effect of ICT infrastructure on e-Government readiness led to the sixth hypothesis:

H6: ICT infrastructure positively influences OEGR.

2.6.2.7 Human Resources

As the present literature review has shown, HR is one of the most important factors in the success of e-Government organisational readiness (APEC, 2008; Azab et al., 2009; Bakry, 2004; Center for International Development - Harvard University and IBM, 2007; ICEGD, 2002; DeLone and McLean, 2003; Molla and Licker, 2001; Rahman, 2007; State Services Commission, 2006; The Clinger-Cohen Act, 1996; The Department's e-Government Framework, 2010; World Bank, 2005; Zaied et al., 2007). There are a number of factors extracted from the literature review that need to be considered such as e-Government awareness, ICT skills, and HR training and development.

There is still a need to increase e-Government awareness among ordinary employees in order to understand their roles and responsibilities (APEC, 2008; Azab et al.,

2009). Top management should be aware of e-Government's impact on employees. Top management specifies the authority and accountability to encourage desirable behaviours in the use of ICT (Al-Omari and Al-Omari, 2006; APEC, 2008; The Department's e-Government Framework, 2010; DeLone and McLean, 2003; Molla and Licker, 2001). For ICT to move ahead in the business-driven environment, management's resistance to change, e-Government impact on employees, and adoption of change must be addressed (Zaied et al., 2007; Azab et al., 2009; DeLone and McLean, 2003).

ICT skills can play a significant role in helping the community achieve OEGR (Azab et al., 2009). Availability of ICT skills should be considered such as proficiency in using ICT (Molla and Licker, 2001; Zaied et al., 2007), and providing a sufficient service to citizens (Accenture, 2002; 2005). Employees with basic ICT skills can assist in a smooth change to e-Government (Molla and Licker, 2001). ICT skills help in responding to a user's hardware and software needs, giving technical assessments in the form of proof of concept or testing new technologies, helping the request for information and request for price processes, relating with dealers on technical issues, and creating and maintaining the technical knowledge base for the organisation (Al-Omari and Al-Omari, 2006).

A major challenge for an e-Government initiative is the lack of qualified employees in the public sector (The Department's e-Government Framework, 2010; World Bank, 2005; Carnoy, 1989). This is a particular problem in developing countries (UNDPEPA/ASPA, 2002). Building HR capacity training and development within government departments can increase the readiness to adopt e-Government systems (DeLone and McLean, 2003). ICT security training can use the lessons learnt from previous efforts of government modernisation (Molla and Licker, 2001).

Recognising the value of human resources in e-Government readiness guided the researcher to the seventh hypothesis:

H7: Human resources positively influences OEGR.

2.7 **Summary**

The present chapter contains a detailed literature review dedicated to the analysis of prior research on what e-Government is, how e-Readiness is measured and assessed, what requirements for e-Government are currently posed, what goals and benefits the establishment of an e-Government program brings about to a particular nation and specific categories of stakeholders, as well as what stages, models, and functional elements e-Governmental programs involve. The section deals precisely with the e-Government specifics and challenges in developing countries and includes a brief overview of the history and present e-Government efforts in Saudi Arabia. The section of EGR assessment contains relevant details about EGR models and factors affecting EGR. The final section of this chapter presents a conceptual model logically derived from the reviewed literature findings, and explains the expected links and importance of those factors model in the context of measuring the internal OEGR of public sector organizations in Saudi Arabia.

Most assessment models are more appropriate for the overall growth of e-Government in each country. They do not focus on the difficulties in the internal factors affecting transformation of a government organisation caused by ICT diffusion. Most of these models disregard the views of stakeholders, although they represent the basis in the success of any e-Government project as the direct users.

The present literature review suggests that an e-Government strategy should cover more than simple integration and support of formal government provided by technology. This research considers a national e-Government programme as one of the main factors from the agencies' perspective such as availability, GSN and GSB. After a thorough investigation of studies and theories, seven dimensions for measuring internal factors affecting OEGR were identified: 1) strategy; 2) user access; 3) e-Government programme; 4) portal Web site; 5) business processes; 6) ICT infrastructure; and 7) human resources. Finally, seven hypotheses presented which emerged from the literature.

Chapter 3: Research Methodology and Design

3.1 Overview

The present chapter provides all relevant methodological data about this research. In section 3.2, the mixed methods research methodology is explained in detail, including the rationale for using this research approach in this particular dissertation. Section 3.3 contains details about the research design of both phase one and two of this research, while section 3.4 explains the principles of sampling for these two stages and the process of sample size selection. Section 3.5 is dedicated to data collection procedures and instruments of phases one and two of the research, while section 3.6 explains how these data were analysed. Section 3.7 discusses the methodological limitations of this dissertation, while section 3.8 explicates possible ethical considerations that may also arise regarding the methodological selection or the choice of research participants. Finally, the chapter ends with section 3.9 summarizing its contents.

3.2 Research Approach

Assessing organisational e-Government readiness should follow a comprehensive methodology with categorised phases and an efficient model. The assessment methodology consists of three phases:

- **The Design phase** in which aims are described and data collection methods are identified.
- **The Evaluation phase** derived from data collected to develop a rational assessment framework. Current organisational e-Government status is addressed and assessed.
- **The Analysis of Results phase** in which the scores gained from the evaluation phase are analysed to map the organisational ICT capability's growth and improvement. The assessment methodology serves as a measurement framework and scoring method. These results also help determine whether the organisation has the technical infrastructure for improvement.

In response to the needs for collection of multi-faceted, diverse data from different sources for the sake of meeting this particular dissertation's research objectives, the

researcher has selected the exploratory sequential mixed methods design. First, the call for using multiple methods in one study are much older than the very field of mixed methods research is, mainly because their use enables triangulation of data, and because the exploratory initial stage of the research may yield useful insights informing and enriching the consecutive, second stage of research, enabling the researcher to reach their research objective even under the conditions of scarcity of initial data and theories, and ambiguity of research outcome expectations because of the pioneering research endeavour having no precedents to rely upon (Niglas, 2000).

The reason for which a combination of qualitative and quantitative methods was considered appropriate in this study is that the study is mostly exploratory in its first phase, trying to identify the perceived relevance and importance of certain factors included in the formulated OEGR model for empirical assessment of the organizational readiness for the transfer to e-Government services. However, after identification of factors subjectively perceived as important by respondents of the qualitative stage of research, the researcher aimed at verifying the validity of the OEGR assessment model objectively, with the help of statistical analysis. Here, the correctness of variables' operationalization and the strength of relationships between identified factors were assessed for the sake of enabling the researcher to confirm the potential of the formulated OEGR assessment model to reveal the realistic state of readiness of the public sector's governmental institutions in a particular developing country, here – in Saudi Arabia.

As Benz and Newman (2008) claimed, qualitative research falls more within the category of social sciences, and it is associated with the ability to describe the meaning of a certain phenomenon from the perspective of people involved and personally experienced with it. At the same time, quantitative research represents the field of empirical studies providing statistical, objective data and enabling researchers to measure and quantify certain dimensions of phenomena of interest (Benz & Newman, 2008). Thus, mixed methods research is a helpful alternative for both quantitative and qualitative research alone; it is characterized as a more eclectic, pluralistic, and rejecting the traditional dualisms limiting certain studies (Belk, 2007). Moreover, according to Hesse-Biber (2010), mixed methods research appears extremely useful in terms of providing multiple perspectives at complex social policy issues to which the government's e-Readiness may be attributed. On the one hand,

people are involved in the provision of governmental services, so the field of research is a social policy issue. On the other hand, OEGR is essentially about technical readiness, availability of equipment, technology, and staff to operate them, so it is more of the empirical, exact science of computer technology. Unifying these two initially different and fundamentally conflicting aspects of research interest requiring different research approaches becomes possible with the help of applying the mixed methods research paradigm.

Mixed methods research is defined as a research design that uses both qualitative and quantitative data to answer the research question. This combination of methods involves collection, analysis, and integration of qualitative and quantitative data in a single or multiphase study (Hanson et al., 2005). In this study, the use of mixed methods research fulfils the condition of complementarity – a feature of research design that allows researchers to gain a better and fuller image of the research problem and to clarify the obtained research result. One of the first studies conducted with the purpose of understanding "the social story in its entirety" was that of Yauch and Steudel (2003). The researchers aimed at achieving cross-validation of comparable data by multiple research methods. In their analysis of organizational culture of two small manufacturers, Yauch and Steudel (2003) first conducted a series of qualitative interviews to collect narrative data then used to create a survey for the collection of quantitative data. The same method of research in phases was used in this study as well. Qualitative interview data analysis gave in-depth understanding of the factors of significance in terms of achieving OEGR in Saudi Arabia, which was then tested quantitatively for verification of the viability of the model and for estimation of closeness of ties and relationships between selected factors.

This dissertation utilizes the exploratory sequential mixed methods design characterized by collection and analysis of qualitative data in phase one of research to inform stage two of the study. Phase two of such a study builds upon phase one findings to strengthen findings of phase one (Hesse-Biber, 2011). In this study, the researcher elicited factors from a preliminary literature review, verified them in the first qualitative phase of research, and then confirmed the factors' relevance through a thorough statistical factor analysis in the second phase of the study.

3.3. Research Design

Research design is important as it serves as a blueprint for meeting the established research objectives. The research design is "the logical sequence that connects the empirical data to a study's initial research questions and, ultimately, to its conclusion" (Yin, 2009, p. 24). The research design is also defined as "sequential procedures, in which the researcher seeks to elaborate on or expand the findings of one method with another method" (Creswell, 2003, p. 210).

It helps researchers answer the question whilst efficiently controlling variance through logic that links the collected data to the initial research question. Generally, research design involves a series of rational decision-making choices, which must be chosen with reference to the purpose of the study, the setting, the extent of the researcher's interference, the time horizon, and the unit of analysis. Decisions are made regarding the type of sample and data collection methods to be used, how the variables are to be measured, and how the concepts and variables will be analysed (Cavana, Delahaye, & Sekaran, 2001). All these research activities and processes are discussed in the following sections. The algorithm of conducting the present study can be seen in Figure 3-1.

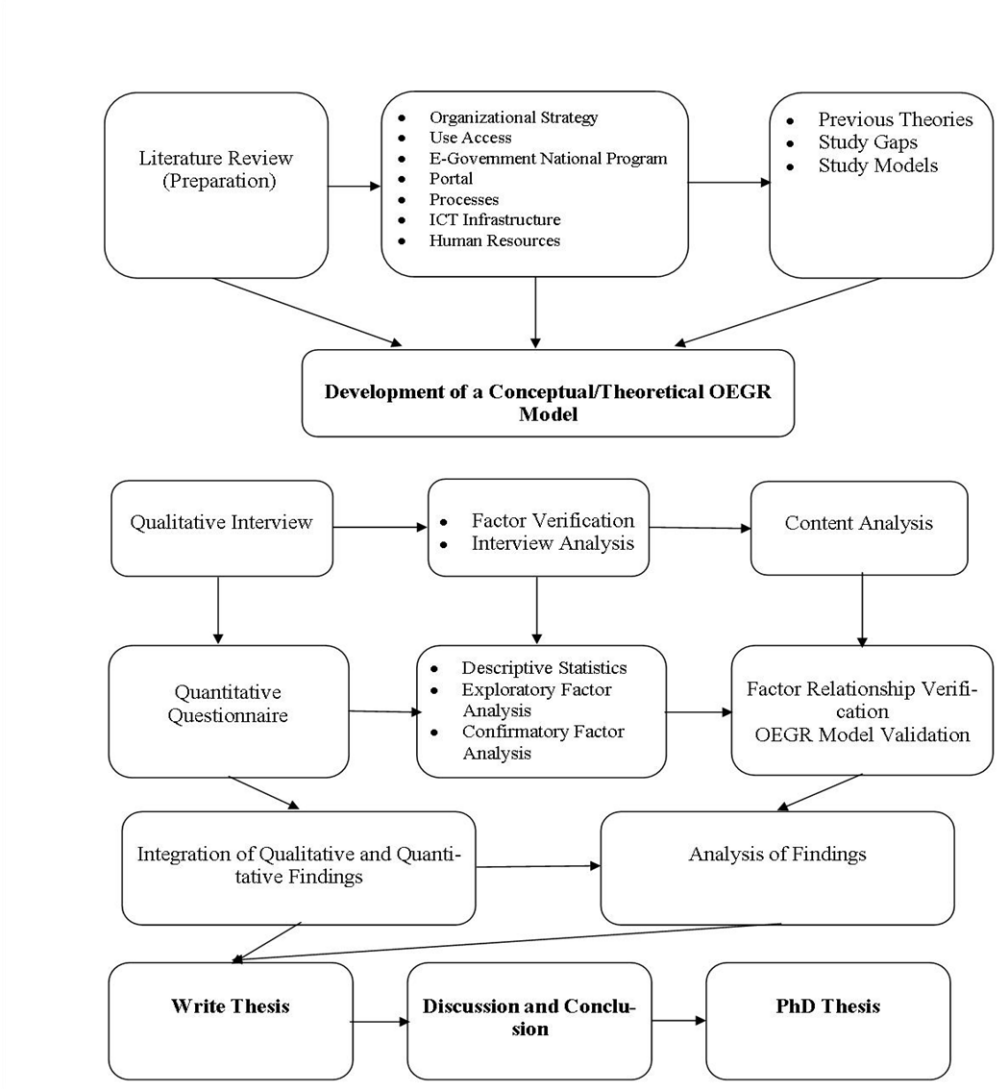


Figure 3-1: Research design (developed for this research)

The primary objective of this investigation was to gather fundamental knowledge pertaining to the e-Government readiness within organisations. This research activity was undertaken through a critical and comprehensive review of Saudi Arabian and international literature. The research design is the framework for data collection and analysis (Cooper and Schindler, 2006; Ghauri and Gronhaug, 2005). It is the 'logic that links the data to be collected to the initial research questions' (Yin, 2003, p 19). The research design used in this study incorporates exploratory, descriptive, measurement scale development and relationship identification. This study used two main phases of qualitative research followed by quantitative research. The former consists of exploratory research and the latter incorporates both descriptive and causal research.

3.3.1 Phase One Research Design

The exploratory stage used qualitative research methods and was required for a number of reasons (Churchill, 1979). First, given the originality of the research, this stage was important in developing and refining the conceptual framework. An exploration with key informants was useful in establishing important variables and relationships. Therefore, it was required for the development of hypotheses. It was also deemed essential in assessing the usefulness and relevance of the research to practitioners.

Furthermore, it assists in determining the practicality of conducting formal research in identifying initial sub-networks within select industries as it involves carrying out interviews with key informants. In addition to contributing to the refinement of the conceptual model and identifying the sampling units for formal research, it was also useful in developing the research instrument for further empirical research (Blaxter et al., 2001). Extant OEGR studies are based on little empirical research in Saudi Arabia. Existing operational definitions and constructs are biased towards the focal organization or country. Therefore, exploratory research is essential in developing the research instrument and the operational definitions and constructs which reflects the e-Government context.

3.3.2 Phase Two Research Design

After the qualitative phase, quantitative research was conducted. A large portion of the analysis of quantitative research is statistical, striving to show how the world can be seen in terms of one reality. This reality, when isolated in context, can be measured and understood, a perspective known as *positivism* (Gay, Mills, & Airasian, 2011). Using a deductive approach, quantitative research seeks to establish facts, make predictions, and test hypotheses that have already been stated. A quantitative methodology is appropriate for this study in order to reduce error, control biases, remove unwanted influences, and conduct analysis through objective measurement and statistical techniques.

3.3.3 Integration of Findings from Phase One and Phase Two

Following this stage, data analysis was undertaken on the developed conceptual model. The data were gathered by seeking input from Saudi Arabian organisations

via a questionnaire survey. Statistical analyses were undertaken in order to assess and refine the conceptual model. SEM analysis was performed to depict and to investigate the strength of the relationships between constructs.

The findings from the study were addressed and the conclusions drawn. These outcomes helped fulfil the final research objective, which sought to advance the knowledge base in the area of e-Government readiness within Saudi Arabian organisations, as well as provide practical implication for Saudi Arabian organisations on how to improve e-Government transformation through optimal use of strategy coupled with fostering a user access, Yesser, Portal, processes, ICT infrastructure and Human resources conducive for e-Readiness and to overcome the limitations. Finally, the strengths and limitations of this study were addressed. Future research was recommended to enhance the findings of the current study.

3.4 Sampling

Sampling for the present study was also conducted in two stages to provide a proper, saturated research sample for each phase of research. “The survey research community believes that representative sampling is essential to permit generalisation from a sample to a population” (Krosnick, 1999, p. 17). A much higher proportion of population of interest is required for quantitative research, so these requirements were considered when selecting and compiling samples both for phase one and two. “Researchers should strive to create as accurately as possible a representative sample of the general population or case of study, and that such sample if planned precisely will highly increase the external validity of the research” (Bryman and Cramer, 1990, p. 246).

3.4.1 Sampling for Phase One

This study used a multi-step iterative approach to select the interviewees following the guidelines of Delbecq (1975) and Okoli and Pawlowski (2004). Figure 3-2 illustrates the outline of steps for selecting experts. Interviewees were chosen based on a preliminary survey and assessment of organisational e-Government readiness in Saudi Arabia. This is due to the fact that these organisations are in a good position to give accurate details on factors affecting OEGR (ARC, 2006; DEST, 2006; Niosi, 2006). Officials were chosen depending on their position and degree of their

organisations' experience in electronic services provisions. Fifteen interviews were completed in this study. Access to these officials was arranged through contacts in the related organisations. The contacts were organised before the data collection stage began.

Saturation of the qualitative sample was achieved at the amount of 15 interviewees. This small but sufficient sample size was considered saturated because of Holloway and Wheeler's (2013) note that qualitative samples mostly range from 4 to 40 respondents, while in some studies, a sample size may be smaller than 10 participants. Macnee and McCabe (2008), in their turn, pointed out that a qualitative sample may be considered saturated in case data become repetitive and nothing more can be identified by attracting more respondents. Therefore, taking into account that the sample comprised ICT and e-Government specialists of various backgrounds, the researcher considered the sample of 15 respondents sufficient for a preliminary qualitative inquiry in this research.

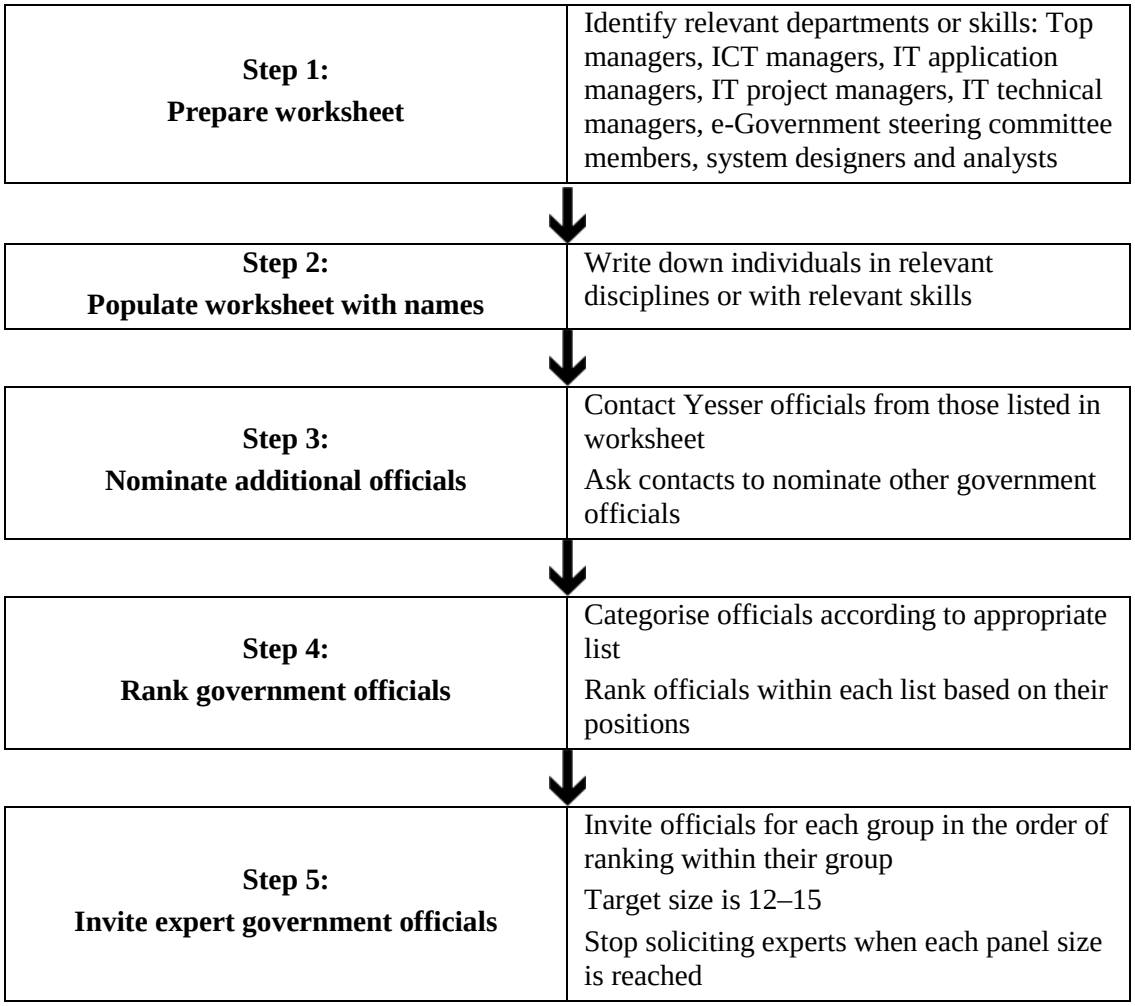


Figure 3-2: Procedure for selecting officials (adapted from Delbecq et al. (1975) and Okoli and Pawlowski, 2004)

3.4.2 Sampling for Phase Two

The sample size was selected based on the requirements of the statistical methods employed for data analysis. According to Hair et al (2010), a minimal significant sample size for a quantitative research endeavour is 100 persons; hence, the present requirement was taken as a baseline of sample requirements in this phase of research. Here the sample population included the e-Government organisation team in particular, which would include IT managers and other staff involved in planning, executing, controlling and regulating projects. The aim was to define criteria for public sectors that are most likely to offer e-Government services.

The survey questionnaire was designed to address the research questions following guidelines provided by Leedy and Ormrod (2005), Neuman (2003), Robson (2002)

and Zikmund (2003). Quality issues such as validity, reliability and sensitivity were considered during the design of questions (Neuman, 2003; Zikmund, 2003).

Participants were chosen from focused sections of government organisations to refine the sample. This process is known as stratified sampling and is defined whereby "the researcher divides the population into strata. The strata must be categories of a criterion" (Bryman and Cramer, 1990, p. 246). In this study, only government officials in a senior position were chosen to participate in the study. Given the investigative nature of this research, a sample size of 1,194 government officials was chosen by co-ordinating with Yesser. The candidate sampling frame comprised 50 Saudi public organisations. To avoid potential bias in the data, no more than fifteen valid feedback questionnaires were chosen from each organisation (Tabachnick and Fidell, 2007).

3.5 Data Collection

To obtain reliable and quality data, this research used primary sources of interviews and a questionnaire and secondary resources via a literature review. The data were collected by face-to-face interviews in Saudi Arabia and through an online and post survey (Delbecq et al., 1975; Dillman, 2000). The interview subjects were free to use their preferred media. One advantage of using these media is that it speeds up the turnaround time between research instruments. The questionnaire was offered in print and an e-Mail version, and followed the principles of survey design (Dillman, 2000). The database contains all data gathered from the completed questionnaires.

3.5.1 Phase One – Qualitative Data Collection

The purpose of the interviews was to survey the perceptions, plans, achievements and barriers encountered in e-Government readiness from the decision makers' perspectives in Saudi Arabia. The interviews were face-to-face. Each interview ranged from an hour to an hour and a half. The results of these interviews were used to refine the research instrument and were later used in the quantitative phase.

Structured interviews are important for assessment and require fewer interviewing skills (Kumar, 1996). The set time was conducive to securing appointments with

interviewees because the list of questions attached to the research invitation letter assisted the participants in estimating the scope of the interview.

The structured interviews (see Appendix 4) included a number of questions in a restricted time, yet were properly designed by focusing on specific areas in small sections. In addition, interviews with top management were carried out to let them discuss factors viewed as critical from the researcher's viewpoint—for example, major online and offline services offered by the organisation and how are they differentiated, level of department and section managers, employees' awareness of the e-Government project in the organisation, communication approaches used within and with other government organisations.

Interviews were recorded, transcribed and analysed. The disadvantages of tape recording (such as mechanical failure) were outweighed by the advantages of obtaining an accurate record of comments (Ticehurst and Veal, 2000). In addition, it allowed the researcher to interact with the interviewee through face-to-face contact, information assimilation and effective questioning (Blaxter et al., 2001). To comply with the ethics of Flinders University the researcher presented a research information sheet (see Appendix 1) and consent form (Appendix 2) and requested the subject's signature after reviewing it. Each interviewee was informed about the purpose of the interview. Interviewees were told that their participation was voluntary, and that their refusal to participate would not affect them in any way, and that they could withdraw at any time (see Letter of Introduction (Interview), Appendix 3).

3.5.2. Phase Two – Quantitative Data Collection

The questionnaire used in this research was based on four previous studies: Liu (2001), Zaied (2007), Azab (2009) and Yesser (2005) and developed to measure e-Government readiness in Texas, Kuwait, Egypt and Saudi Arabia. Some questions were customised and others were added to reflect all the measurements that are present in the proposed model.

A questionnaire template was developed. The study followed Leedy's (1997) practical guidelines in developing the questionnaire draft: use clear language; meet study aims; plan development, sample, distribution and collection; and create a solid covering letter.

Simple English was used with definitions provided in some cases. English and Arabic versions (see Appendix 9) were created as not all participants were expected to be fluent in English. The questionnaire was divided into sections for logical development and ease of understanding. A simple and informative cover letter (Letter of Introduction, Questionnaire, Appendix 6) was prepared to notify the participants of the purpose and significance of the study. It was written using clear language to facilitate participants giving honest and unbiased information. Confirmation of the confidentiality measures was provided.

The survey was conducted both online via Qualtrics statistics software (see samples of English and Arabic versions, Appendices 7 and 8) and on paper. In order to encourage participants to complete the questionnaire, an iPad 2 was offered.

To ensure the quality and ethical standards of the research process, the researcher explained some issues before the participant starting filling in the questionnaire. Every respondent was informed about the reason for the questionnaire. Respondents were told that their participation was voluntary, their refusal to participate would not affect them in any way, and that they could withdraw from this questionnaire at any time (see Appendix 6).

This next section is divided into two subsections: 3.5.2.1on questionnaire scales, and 3.5.2.2 questionnaire pre-testing methods.

3.5.2.1 Questionnaire Scales

Constructs were measured using a seven-point Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree) to reveal the participants' opinions regarding the study variables. The questions on each variable were grouped.

A Likert scale is often used in survey design to get around the problem of obtaining meaningful quantitative answers to restricted closed questions (see Appendix 9). A Likert scale is used when respondents are asked to indicate strength of feeling about a particular issue. Using a Likert scale with closed questions generates statistical measurements of people's attitudes and opinions (Churchill, 1979). The reason behind using a 7-point scale is to boost the accuracy of the measures when compared with 5- or 3-point scales.

Consistent with Churchill's (1979) approach for developing reliable measures, as discussed in Chapter 4, each construct was operationalised by first sourcing items from the literature and then adjusting the measures based on interview data. These measures were also tested for reliability as discussed in Section 5.7.

3.5.2.2 Questionnaire pre-testing methods

Pre-testing was employed to eliminate unanswerable and unclear questions, or questions individuals might be unwilling to respond to. Pre-testing is used to discover clear respondent barriers and interviewee concerns (Blair, 2004). It was found to be more reliable and applicable in this context.

For validity, it is important to ensure that respondents have a common frame of reference and consequently, the instrument was pre-tested with two senior lecturers, two PhD students and four professionals in the field of IS and e-Government. Three PhD students in IS and e-Government were asked to complete the survey and give suggestions about the questions. Based on their feedback, the wording of some questions was modified to improve clarity. Next, five professionals in IS and e-Government were asked to answer the survey and indicate whether the questions precisely measured each construct or if they were confusing or contradictory. The instrument was modified to incorporate the feedback from those academics and professionals. Finally, the questionnaire was translated into Arabic and the translation verified by two PhD students whose first language is Arabic.

3.6 Data Analysis Strategies

The analysis of quantitative and qualitative study evidence is one of the least developed and most difficult aspects of doing researches (Yin, 2009). The following sub-sections explain the specific strategies employed at various stages in the analysis. The data were collected by the researcher in Saudi Arabia using conventional and electronic mail based on the guidelines given by Dillman (2000). In this study the quantitative data from primary sources was analysed and interpreted using different statistical tools such as SPSS for Windows (Coakes, 2005) and Analysis of Moment Structures (AMOS). The generated hypotheses were tested using such tools to increase the validity of the data, as well as to yield quality outcomes. To test the significance of the data, statistical tools were used.

3.6.1 Phase One – Qualitative Analysis

The analysis of qualitative data was conducted through several steps. First, data were acquired from recorded interviews, and observation notes were assessed (Creswell, 2003). Subsequently, attempts were made to uncover relationships between these categories. Content analysis was used to set the rules followed in qualitative data analysis (Creswell, 2003). For instance, the analysis of qualitative data from diverse sources was directed to proving or rejecting the effect of any of the seven dimensions of the suggested model.

3.6.1.1 Validity

Steps were taken to address validity during this qualitative phase of the research. First, multiple sources of information were used (Yin, 2009). While interviews comprise the primary source of information, supporting secondary data were also used. The secondary data were used to verify and triangulate the findings of the interviews. Second, as described in Section 3.4.1 fifteen interviews were conducted with key officials from fifteen different public organisations in Saudi Arabia.

Dimensional sampling was deemed essential for interviewing key participants and IT specialists in order to assess the practicality and relevance of the research, as illustrated in Table 3-1. Appendix 5 gives the full details of the interviews. Taking into account diverse points of view of information sources represents a significant form of qualitative triangulation by avoiding biased judgments (Yin, 2009). Following the details to findings and records of the interview was preserved as well. These techniques were used to enhance the quality of results by improving the research construct validity and the reliability (Yin, 2009). Also, the interview results are used to elaborate upon the findings from the surveys about the demography of participants.

Table 3-1: List of interviewees

Position	Title	Experience (years)	Interviewee#
Chief Information Officer (CIO)	Doctor	23	1
Head of Internet and e-Services	Engineer	18	2
Country Manager of IT Projects	none	16	3
Data Processing Manager	none	20	4
Information Technology Manager	none	28	5

General Supervisor of IT Applications	Engineer	14	6
Dean, Doyenne of e-Services	Doctor	19	7
General IT Manager	none	32	8
IT Manager	none	22	9
Head of Electronic Services	Doctor	18	10
IT Manager	none	19	11
Assistant Manager of IT Development	Engineer	25	12
Head of IT Development and Application	none	17	13
IT Manager	none	20	14
Business Development Manager of e-Services	Doctor	13	15

3.6.2. Phase Two -- Quantitative Analysis

Quantitative analysis was used to identify relationships between factors and variables essential to the e-Government readiness in Saudi Arabia. These relationships were used to refine the findings from the qualitative analysis. In order to test the research model, multivariate statistics were used to quantitatively analyse the data collected via the questionnaire. The techniques were considered appropriate for this study because they provided an analysis of a complex data set with many independent and dependent variables (Tabachnick and Fidell, 2007).

Testing the research model was conducted in three steps: 1) descriptive data analysis; 2) measurement scale development; and 3) relationship identification. The reason for using these steps is their compatibility with testing the research hypotheses in a model containing several dimensions, and assessing the impact of each dimension by a number of measuring constructs (Liu, 2001).

3.6.2.1 Descriptive data analysis

Descriptive data analysis used SPSS software to obtain a sense for the data and to identify if they matched the essential assumptions necessary for performing multivariate data analyses. SPSS was selected for achieving this aim because of its powerful features in transferring data from the statistics software (Qualtrics) used in this study, producing descriptive statistics such as variety of variable types, easy methods for coding variables, and for analysing data. The analyses included a description of the participant's profiles and a test of the data screening (through examining normality, means, standard deviations and standard error of the mean).

The analyses also included a preliminary analysis of the mean values to achieve an extensive picture of the participants' views concerning each construct, based on the complete survey respondents. Chapter 5 presents the details and results of the descriptive analysis.

3.6.2.2 Reliability and Validity of Data

In addition to examining reliability, the validity of the measurement scale was assessed using factor analysis. This was carried out using two sequential techniques: 1) exploratory factor analysis; and 2) confirmatory factor analysis. SPSS 19 was used to calculate reliability, validity and multi-collinearity, while AMOS 19 was used to perform CFA of the measurement instrument (Pallant, 2010).

The preliminary internal consistency testing was performed to ensure the degree to which responses are consistent among the items/variables within a single measurement scale. Reliability in most conditions can be expressed as a correlation coefficient; there are several ways to do this, the most common being Cronbach's alpha, which is dependent on the internal consistency and gives an idea of the consistency between items and with the scale as a whole (Hair et al., 2010). A low Cronbach's alpha coefficient points out those variables which may be extremely heterogeneous and perform inadequately in representing the measure.

3.6.2.2.1 Exploratory factor analysis

The main reason for employing EFA was to discover the number of factors that theoretically lay behind the set of items in each construct. The results were then confirmed using CFA to present a base for subsequent model assessment and refinement. EFA facilitates the recognition of suitable variables and the analysis of interrelationships between large numbers of variables to clarify their primary dimensions (Hair et al., 2010). The results from the EFA produced a fundamental analysis of the valid factor structure of each model construct. EFA was conducted using SPSS.

3.6.2.2.2 Confirmatory factor analysis – construct validity assessment

Confirmatory factor analysis, which is a part of the structural equation modelling technique, was performed to appropriately assess construct validity and unidimensionality. CFA was chosen due to its being a stricter interpretation than

those methods applied in the exploratory analysis (Gerbing and Anderson, 1988; Hair, 2006). CFA is a technique for testing how an adequate *a priori* factor structure and its relevant model of loadings match the actual data (Hair, 2006). In addition, it is useful to filter, support a presented structure, and test an identified dimensional structure in an extra population (Hess and DiStefano, 2005).

The method assesses how well the factor structure of each individual construct fits the data, and tests the model factors to evaluate unidimensionality and construct validity. The CFA model measurement is like EFA, but it varies in that the number of factors, and the relations between the variables and factors, must be recognised and specified prior to analysis (Hair et al., 2010).

The main advantage of CFA is its ability to identify how well the particular factor model represents the data, by investigating the model fit indices. Once the fit indices are confirmed to be fine, the model is considered to be accepted. A model with inadequate fit indices will as a rule be respecified to enhance the model fit. Fit indices are usually categorised as either absolute or incremental (Hoyle, 1995) as detailed below.

First, "*Absolute fit* indices *are concerned with the degree to which the hypothesised model reproduces the sample*" (Shah and Goldstein, 2006). The common essential index of this category of measure is chi-square (χ^2) statistics, which usually consist of the value of χ^2, degree of freedom (*df*) and significance level (*p*-value). The non-significant χ^2 indicates that the model fits the data; hence the model is approved. However, a significant χ^2 ($p<0.05$) indicates the model does not fit and should be rejected. Due to such a dichotomous rule, there are many ambiguities linked to interpreting χ^2 (Hoyle, 1995). Moreover, χ^2 is a function of the sample size; thus it is considered perceptive and biased, particularly when the sample size is large. To address these concerns, several alternative indices have been developed to calculate the degree of model fit (Shah and Goldstein, 2006). A number of widespread indices include: relative chi-square (χ^2/df); goodness-of-fit index (GFI); adjusted-goodness-of-fit index; standardised root mean square residual; and root mean square error of approximation (RMSEA).

Second, incremental fit indices are concerned with the degree to which the model of interest is superior to the following substitutes: 1) the null model in which no covariances amongst the variables are identified; and 2) the model that fits perfectly with the data (Hoyle, 1995; Shah and Goldstein, 2006). Examples of the most common incremental fit indices are: normed-fit index; Tucker-Lewis index (TLI); comparative-fit index (CFI); and incremental-fit index (IFI).

The estimation method needs sufficient calculation of the model factors and fitting indices. A diversity of estimation methods are available, for example: the maximum likelihood (ML), generalised least square, weighted least square (WLS), asymptotically distribution-free (ADF), and ordinary least square (OLS).The choice of estimation method relies on the distribution of the model complexity and sample size of the data (Hoyle, 1995; Shah and Goldstein, 2006). Each estimation method has computational advantages and disadvantages. ML presumes data are univariate and multivariate normal, but it is moderately unbiased under moderate violation of normality (Bollen, 1989). However, WLS and ADF do not require an assumption of normal distribution, but they require a very large sample size for precise estimates. OLS is concerned with the majority robust method and no distributional assumption is required; it is scale-invariant and does not give fit indices or standard errors for estimates (Shah and Goldstein, 2006).

3.6.2.2.3 Other validity measures

The ability to evaluate the construct validity of a recommended measurement theory is one of the main strengths of CFA. Construct validity refers to the level to which a set of measured items actually reflects the theoretical latent construct that the items are proposed to measure (Hair et al., 2010). As a result, construct validity deals with precision of measurement. To assess construct validity via CFA requires a test of the convergent and the discriminant validity.

Convergent validity is the level to which the measured variables of a particular construct contribute to a high fraction of the variance. The assessment of the convergent validity concentrates on the scale of the standardised factor loadings and their level of significance. The larger the factor loadings with matching significant *t*-values, the stronger the proof that the measured variables embody the underlying

constructs (Bollen, 1989). Hair et al. (2010) recommended that the factor loadings should be greater than 0.50. On the other hand, Koufteros (1999) suggested that significant *t*-values should be adequate to show convergent validity. Therefore, besides significant factor loadings, the reliability of the variables, which can be identified by examining the R^2 value, is an indicator of convergent validity. Variables should have R^2 values greater than 0.50 to confirm an acceptable reliability (Bollen, 1989).

Discriminant validity is the level to which a construct differs from other constructs (Hair et al., 2010). Consequently high discriminant validity confirms that a construct is unique and captures some observable fact that other measures do not. Discriminant validity can be evaluated by an assessment of the correlation coefficient among each pair of variables (Kline, 2011). If the value of the correlation coefficient is very high (greater than 0.850) the variables of interest might embody the same perception and should be combined as a single variable (Tabachnick and Fidell, 2007a). The result of the CFA for each individual construct is in the next sections.

3.6.2.3 Relationship identification

Once the reliability and validity of the measurement scales were established, the conceptual model was assessed. The current study employed a powerful technique called Structural Equation Modelling (SEM). There are two steps involved in the SEM process: validating the measurement model; and fitting the structural model. The former is achieved through confirmatory factor analysis, whilst the latter is achieved through path analysis with latent variables (Garson, 2011).

In this study, AMOS (version 19) was employed since it was a powerful tool used to identify which particular independent variables predict the variance of dependent variables chosen by the study (Tabachnick and Fidell, 2007a). AMOS was used because it was developed to run on SPSS as an extension program. By using structural equation modeling, assurance was found in the underlying relationships, such as internal validity of the model. In addition, it was possible to expansively test these relationships by facilitating a shift from exploratory to confirmatory analysis (Hair et al., 2010). More details and results of the measurement scale analysis are presented in Chapter 5.

3.7 Limitations of Research Design

The present study has certain limitations. First, there are some methodological limitations; as stated by Hall (2008), mixed methods research becomes problematic when conclusions drawn from its different parts are incompatible. Nevertheless, this problem is avoided in this research because one phase logically flows out of the other one. Second, mixed methods research is more expensive and time-consuming, which is nevertheless justifiable for a PhD thesis of such significance. De Lisle (2011) also added that the mixed methods research endeavour is likely to succeed only if there is a strong philosophical orientation and theoretical model guiding it; in other cases, there is a high threat of mixing inappropriate data and methods, and receiving research results of low value. However, these limitations are also effectively countered in this research as well by means of ensuring that the datasets and factors of interest are the same in both stages of research.

The present study has other limitations as well. First, there is a limitation in the research setting and sample. In regard to sample, only a 46% response rate was achieved, which is quite poor for the quantitative research stage. Moreover, research is non-generalizable so far – at least its qualitative part – since the study took place only in Saudi Arabia and used an exclusively Saudi Arabian sample for data collection and analysis. Finally, there is a limitation of the OEGR model as it applies only to the public sector organizations, which makes it inappropriate for analyses of private sector organizations.

3.8 Ethical Considerations

Any ethical research endeavor involving human participants should provide proper protection for the rights of volunteering respondents, which is followed by means of complying with the general ethical research principle that "research must respect the autonomy of participants, must be fair in both conception and implementation, and must maximize potential benefits while minimizing potential harms" (The Belmont Report, 1979). Therefore, the present research was conducted in compliance with all general ethical principles, though this particular study is associated with zero risks for participants. The researcher had to ensure that the whole research process is ethical, that participants are fully informed of the research nature, tasks, goals, and

design. Participants had “a good understanding of the information and their choices, not only at the time of enrollment, but throughout the research”, and had an opportunity to contact the researcher in case of any questions or concerns (The Belmont Report, 1979).

All respondents were properly informed that their participation in the research was whole voluntary, so they could withdraw from participation at any time. Moreover, confidentiality of data provided by the respondents was ensured properly so that no personal information was publicly reported and published (as explained in Section 3.5.1 and 3.5.2). Such level of confidentiality was achieved by coding all personal information from the questionnaires and interviews, storage of all records and filled questionnaires in a secure folder to which only the researcher had personal access. In addition, personal information would not be disclosed by the researcher to unauthorized individuals even after publishing the PhD thesis. Bias was eliminated by means of double-checking the collected data and controlling the process of data interpretation by peer review.

3.9 Summary

This chapter provided the details of the research approach, the selected research design, and methodologies used at two stages of research. Qualitative and quantitative methodologies were used to analyse the data gathered respectively from interviews and surveys. Structured interviews and face-to-face administered questionnaires were the primary data collection strategies used throughout the study phase. Essentially, the literature review led to the development of a survey instrument, while interviews were employed to refine and expand the survey results. Participants were chosen according to pre-defined criteria. The questionnaires were used to draw a profile of those Saudi Arabian government organisations most or least likely to use e-Government initiatives. They were examined to define variables and relationships using different statistical techniques. Interview results were used to refine and supplement these profiles. This chapter comprised sections detailing the research structure, activities and results. It clarified the research methods and design. It provided further details of the data collection strategies and specified the methodologies used for data analysis. Moreover, it provided details about the limitations and ethical considerations of this study.

The next chapter will present a complete analysis of the qualitative data obtained from interviews with selected top managers of government organisations in Saudi Arabia. It will provide details of the refined conceptual model based on the qualitative research findings and hypotheses formulated on the basis of interview analysis to be tested in the quantitative section of research.

Chapter 4: Qualitative Results: Model and Hypotheses Development

4.1 Overview

This chapter summarises the overall results of qualitative data analysis, model and hypothesis development. Despite the international trend towards the adoption and transformation of e-Government to encourage organizational e-Readiness, academic research in this field remains elementary in Saudi Arabia As discussed in Chapter 2 (Alshehri and Drew, 2010; Al-Nuaim, 2011; Alotaib, 2013). This chapter presents the findings of the data acquired from the interviews which reviewed the plans, progress and barriers in developing e-Government in Saudi Arabia from the decision maker's and ICT specialist's point of view. It demonstrates the results of the qualitative data gathered from different government organisations. This study involves a multi-method approach using both qualitative and quantitative methods. Qualitative research is useful in the exploratory stage to refine the conceptual model that includes internal factors affecting OEGR and a set of hypotheses, and to serve as a basis for the design of the subsequent quantitative research. The quantitative research is useful in providing explanatory or causal evidence and in advancing theory in the field of OEGR.

This chapter analyses the data obtained from interviews. Each interview ranged from an hour to 90 minutes. Appendix 6 (Letter of Introduction) details the protocol used for the interviews. Guided by the theoretical background, the interview transcripts were coded and analysed to ascertain the relevance of the factors that were extracted from the literature. Validity of the qualitative data is presented in Section 3.6.1.1 (Chapter 3). The findings of the interviews are discussed in Sections 4.2 to refine the conceptual model and to develop the qualitative research instrument for the subsequent phase. Inter-relations between the strategy and the other six dimensions are discussed in Section 4.3. The refined conceptual model and hypothesis development are explained in Section 4.4. Finally, the chapter is summarised in Section 4.25.

4.2 **Conceptual Model**

This section discusses the preliminary results from the qualitative research, undertaken to examine the conceptual model that emerged from the literature review into a causal model. The factors identified as influencing the OEGR in the literature review have been asked about during the interviews with respondents, and their opinions about the real-life impact of those factors on the state of OEGR in Saudi Arabia have been evaluated. That analysis was further developed into hypotheses for Phase 2 of this research – the quantitative testing of the designed OEGR assessment model.

4.2.1 Strategy

Interviews confirmed the findings in the literature that strategy is fundamental for e-Government to succeed (Alshehri and Drew, 2010; Alsobhi et al., 2009; Yesser, 2013; Bakry, 2004) . There was unanimous agreement that the primary factor for OEGR should be strategy: for example, Interviewee #10 stated that "Organisational e-Government strategy is important for any government organisation." Interviewee #5 concurred: "Due to the importance of strategy, the authority-prepared e-Government strategy will be phased in progressively. This is the first year and it is expected to take 5 years for full implementation." Interviewee #14 mentioned that, "The organisation has created a five-year strategy in order to adopt and diffuse the e-Government initiative. There was a high delay in preparing it."

Many officials stressed the need for e-Government strategy and plans. For example, the Country Manager of IT Projects stated that "We still need to go ahead with the project to increase awareness of e-Government and to start making plans and strategies for ICT development."

The next three sections detail the importance of including leadership, an action plan, and a development plan in organisational e-Government strategy and confirmed the inter-relations between strategy and the other six dimensions.

4.2.1.1 Leadership

Interviewees confirmed the importance of leadership for e-Government readiness. Interviewee #4 emphasised that support from leadership is the most important factor

of all for e-Government implementation and dissemination: “From the leader’s prospective, ICT is the most important facilitator and contributor to the organisation’s success.” Interviewee #9 stated, “Some government organisations are more ready than others due to the availability of qualified executive managers.”

Interviewee #7 emphasised that, “leadership is important to ensure that the organisation is e-Ready.” Identification of vision and objectives is important to verify the degree to which these were accomplished (World Bank, 2005; CARICAD, 2009; FY2004 - FY2008; 2008). It was felt that the ICT vision and objectives should be a priority of an advanced knowledge-based e-Government (Interviewees #5, 6, 9 and 13). Interviewee #8 commented that, “The leaders identified the vision and objectives starting from the strategic changes witnessed by the organisation regarding services.” Interviewee #7 emphasised that, “Leadership is important to identify and to achieve the strategy goals. The organisation should be e-Ready by allocating qualified people, restructuring business workflows, building suitable databases and applications, building ICT infrastructure, developing a right Web site portal and easing accessibility.”

Leaders should identify strategy that has possible challenges, technological plans, legislation and policies (World Bank, 2005; Bakry, 2004; Azab et al., 2009; Alshehri and Drew, 2010). Interviewee #6 stated that it is important for organisations to be prepared for e-Readiness challenges and the importance of including ICT infrastructure, processes, human resources, portal and Yesser. “The organisation leaders faced many challenges before going online such as preparing a comprehensive strategy that ensured improving the ICT infrastructure, business processes, people, portal and integrity with Yesser.” Driving forces are essential to the development of the ICT sector in Saudi Arabia, a factor that is highly influenced by the level of leadership support (Interviewees #3, 7, 8, 10, 12, 14 and 15).

Interviewee #6 stated, “Providing services online and adopting up-to-date technologies within the organisation are supported by the minister and senior officials.” However, Interviewee #11 admitted that, “The strategy did not achieve many of the objectives and goals due to a lack of motivated leadership and qualified employees.”

However, interviewees agreed that leadership is not enough for moving the organization towards a change towards greater ICT adoption; they focused on the need for adequate financing and provision of necessary facilities for the governmental agencies to facilitate the transition to e-Government. Interviewees confided that the Ministry of Finance has increased the budget for ICT adoption and development in each organisation. Some government departments have large budgets and a commitment from their top officials to ICT while others have less.

A significant problem was identified by the interviewees regarding leadership in OEGR; they stated that few staff members were involved in the OEGR enhancement, which leads to the disruption of the process between ICT specialists and regular staff. In case ICT specialists are not included into the leadership team that conducts OEGR preparation, the agency is likely to fail because of the high level of importance attributed to the technical side of e-Government and e-Services. As Interviewee #1 stated, ICT specialists are unaware of the impact of e-Government strategy on OEGR, because few are involved in strategy preparation.

Many officials indicated that there is a need to create a leadership steering committee to ensure the progress of e-Government projects (Interviewees #2, 3, 10, 5 and 13) consistent with findings in the literature (Bakry, 2004; Yesser, 2005). Interviewee #10 noted that "An e-Government steering committee was formed to monitor and control all e-Government projects." Interviewee #5 confirmed that "The e-Services committee was recently created including all branches." Interviewee #13 explained that "The e-Services committee consists of members from the organisation and representatives from government health sectors." "The e-Services committee is responsible for implementing e-Government projects" (Interviewee #3).

4.2.1.2 Action plan

Interviewees confirmed the findings in the literature that action plans are important to achieve e-Government milestones and objectives (Azab et al., 2009; Bakry, 2004; World Bank, 2006). For instance, the Interviewees #12 and #7 noted that their e-Government strategy has an action plan with important key performance indicators such as accountability. Interviewee #1 emphasised that "The action plan was part of the e-Government strategy for modernising the public sector by utilising ICT."

However, there was much discontentment voiced by interviewees about the current progress in action plan realization. Interviewees voiced the need for the action plans to be realistic, and to take into account the contextual aspects of Saudi Arabian governmental organizations' functioning. As an illustration, Interviewee #4 confirmed the importance of applying IT policies and roles: "The organisation should enforce IT laws and legislation. The current laws do not go in depth to cover online activities. The task of making rules, laws and legislation in general is beyond the organisation's responsibilities."

The action plan strategy could help in establishing e-Services and facilitating e-Service delivery for stakeholders by saving time, money, and effort. This was confirmed by Interviewee #2: "The e-Government strategy and action plan of the organisation is based mostly on providing an additional and easy channel of communication for citizens and other stakeholders by saving time, money, and effort."

Finally, the General Supervisor of ICT Applications stated, "The action plan was concerned with modernising the organisation through the allocation of fund, timeframe, and the use of ICT applications."

4.2.1.3 Development plans

Interviewees confirmed the findings in the literature that development plans are an important component of strategy (Azab et al., 2009; Bakry, 2004; Lee, 2010a; Yesser, 2005). Interviewee #12 said, "The organisation prepares ambitious future plans to upgrade the level of performance in different services. Such five year plans include the creation of the infrastructure for e-Government." Interviewee #4 alluded to the importance of creating a clear e-Government development plan: "The organisation is adopting important e-Government development plans".

Interviewee #1 also confirmed the importance of plans for the e-Government project, through implementing policies, ICT infrastructure, attractive portal, and having skilled staff and media channels:

> The e-Government future plan strategy is important to re-engineer business processes in each department to facilitate services offered and to

> avoid any duplication of work, thus reforming the processes over all departments. The next step is to apply sufficient policies and ICT infrastructure, select the right people, design an attractive portal and provide different access channels and published in media to ensure the implementation and awareness of the e-Government project all over the organisation.

Interviewee #4 also revealed the importance of developing a plan to have a high quality portal that is evaluated regularly by the Ministry of Communication and Information Technology: "OEGR assessment of the portal is undertaken regularly within the MCIT".

Overall, interviewees confirmed the literature findings that strategy has an effect on the other six dimensions for OEGR to succeed. For example:

> E-Government transformation needs a high level of strategy that leads e-Government readiness of organisations in different areas such as infrastructure, HR, re-engineering procedures, integrity with Yesser and offering the right delivery channels. (Interviewee #3)

> E-Government organisational strategy is important for any government organisation. The idea is to check on the proper timings to introduce the service and meet all its prerequisites including people, ICT infrastructure, portal, delivery channels, integrity with Yesser and implementing suitable applications. (Interviewee #10)

The integrity of ICT systems with the national e-Government programme is essential (Yesser, 2005). All interviewees stressed the need for ensuring integrity as a part of planning.

In line with the confirmed necessity and propriety of such OEGR aspect as Strategy embodied in the sub-aspects of leadership, action plans, and development plans, questions about these factors and variables were included into the quantitative questionnaire. The components of the assessment scale represent a summative set of components identified in prior empirical studies dedicated to strategy as an element of OEGR (Saghafi et al., 2011; Alshehri, 2010; Koh et al., 2007; Zaied et al., 2007). In prior research, the factor of strategy was associated with vision and objectives

((Alshehri and Drew, 2010; Haug et al., 2011; Lee, 2010a; World Bank, 2005), priority for e-Business and government support, such as plans and projects (Bakry, 2004), technological and legislative challenges (Azab et al., 2009; Bakry, 2004; World Bank, 2005), e-Government monitoring (Bakry, 2004; Yesser, 2005), and alignment with the organization's business and information systems strategy (Azab et al., 2009). In addition to those features, the sub-category of action plan should possess the following characteristics: accountability, structure, resource allocation, IT policies, timeframe and procedures (Azab et al., 2009; Alshehri and Drew, 2010). On top of that, the prospective development plan should incorporate such elements as delivery channels plan, e-Government programme plan, portal plan, organisation ICT plan, ICT human resources (HR) plan, and related non-ICT plans (Azab et al., 2009; Bakry, 2004). Therefore, Table 4-1 unifies and operationalizes all suggested factors and variables of the organisational e-Government strategy construct along with their corresponding questions (Section 2 of the Questionnaire, Appendix 9).

Table 4-1: Factors of strategy construct and corresponding questions

Factors	Question No.
Leadership	
Priority for e-Business	A1
Vision	A2
Objectives	A3
Challenges	A4
Legislation	A5
Top management involvement	A6
Steering committee	A7
ICT specialists responsibilities	A8
Action Plan	
E-Services	B1
Resource allocation	B2
Accountability	B3
ICT Policies	B4
Stakeholder's roles	B5
Procedures	B6
Timeframe	B7
Fund resources	B8
Structure	B9
Development Plan	
Delivery channels plan	C1
Integrity	C2
Architecture of an e-Government Web site portal.	C3
ICT applications/systems	C4
Fundamental Technology	C5
People	C6
Media	C7

4.2.2 User Access

Interviewees confirmed the findings in the literature that it is important for OEGR to offer e-Services to citizens (G2C), government (G2G), the private sector (G2B) and employees (G2E) (World Bank, 2005; APEC, 2008; Ebrahim and Irani, 2005). They also confirmed that these groups need to have multi delivery channels to access e-Services. Clearly, organisations which do not offer appropriate e-Services and multi delivery channels have difficulties in dealing with their stakeholders. For instance, people wait in long queues to complete their procedures (Interviewee #1).

4.2.2.1 Stakeholders

Interviewees confirmed that it is important to offer e-Services to stakeholders. Interviewees explained their e-Services offered:

> We offer G2C e-Services such as civil affairs, traffic and labour importation. We offer G2G e-Services, including to the Ministry of Health. We offer G2B services such as the Muqeem system for entry visas and other e-Services including public queries, Hajj eligibility, insurance validity for residents, query exit/re-entry visa and the Tamm system for traffic violation and transferring cars. The organisation offers G2E e-Services via ERP and e-Mail. The public can provide feedback on the online services. (Interviewee #2)

Another example:

> The organisation offers around twenty G2B services in serving investors and improving the quality of investors' and contractors' services. The organisation offers around forty G2E e-Services via ERP and other applications. There are around ten G2C e-Services such as applying for approval to practise careers or query about lands. (Interviewee #1)

4.2.2.2 Delivery channels

Interviewees confirmed that stakeholders should have multi delivery channels for access (Alotaib, 2013; Ebrahim and Irani, 2005; IDA, 2004, Yesser, 2005). "Because of the importance of user access, the organisation offers different delivery channels which are Web site, BPAY, ATMs and telephone" (Interviewee #3). "It is important to provide multi types of delivery channels for all stakeholders such as Web site, e-payment methods and mobile" (Interviewee #7). "The organisation offers about five G2G e-Services such as payment through the SADAD system, ATMs, BPAY, Kiosks and call center. The public can provide feedback on online services but the participation is low" (Interviewee #1).

Few government organisations coordinate at the application level (Interviewees #2 and 7). This problem can be solved by mapping all delivery channels to the same application. This can also be achieved through synchronising multiple application systems. This can be done in real-time, so the information is integrated over all channels. But, many organisations in the public sector still work in batch mode, causing delays in synchronisation.

As one can see from this analysis of the use access variable, the overwhelming majority of interviewees assessed all its aspects as well-developed and efficiently implemented in the Saudi Arabian public sector. Therefore, the factors of stakeholders and delivery channels were also included into the quantitative questionnaire for Phase 2 of this research. Table 4-2 details the items included in the questionnaire for user access (Part 1, Section 3 of the Questionnaire in Appendix 9). Questionnaire respondents were offered to evaluate the access of various stakeholders such as individuals, other governmental organization, businesses and employees to services offered by the Saudi Arabian e-Government now (in percentages), and were asked to indicate delivery channels that they used and considered appropriately developed in Saudi Arabia.

The factor of user access can be best operationalized with the help of assessing the extent to which all kinds of e-Government's services (like G2C, G2G, G2B, and G2E services) are accessible (Al-Nuaim, 2011; Ebrahim and Irani, 2005). Findings of World Bank (2005), APEC (2008), and Ebrahim and Irani (2005) suggest the need to include this set of services into the strategy. Since accessibility refers to the ease of obtaining information and services through an e-Government delivery channel, measuring that ease has become the key operationalization criterion for the factor of user access (Criado and Ramilo, 2003; Homburg and Bekkers, 2002; Dawes, 2009) – see Table 4-2.

Table 4-2: Main factors of user access and corresponding questions

G2C e-Services as % of all **G2C** services (Automatic and Manual)	0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
G2G e-Services as % of all **G2G** services (Automatic and Manual)	0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
G2B e-Services as % of all **G2B** services (Automatic and Manual)	0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
G2E e-Services as % of all **G2E** services (Automatic and Manual)	0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

The variety of available delivery channels is also a key criterion within measurements of user access; is e-Government services are accessed through multiple channels, the demand for them is certain to grow, and OEGR is likely to increase in the course of time (Accenture, 2005; Alotaib, 2013; Guo and Lu, 2005). Therefore, identification of the number of variety of available channels of user access is a fundamental aspect of OEGR. Channels of primary importance include

governmental websites, ATMs, PCs and Laptops, Mobile phones (WAP), Call centre, and kiosks (UNPAN, 2002; Alotaib, 2013; Ebrahim and Irani, 2005; IDA, 2004). Hence, Table 4-3 details the delivery channels included in the questionnaire (Part 2, Section 3 of the Questionnaire in Appendix 9).

Table 4-3: Main factors of user access construct (delivery channels) and corresponding questions

Factors	Question No.
Web site	A1
ATMs	A2
PCs and Laptops	A3
Mobile phones (WAP)	A4
Call centre	A5
Kiosks	A6

4.2.3 E-Government Programme - Yesser

The qualitative findings revealed the importance of an e-Government programme in public organisations. Connecting to a national e-Government programme raises the public sector's productivity and efficiency, provides better and easier-to-use services for customers, increases ROI, and provides the required information in a timely and highly accurate fashion (Almarabeh and Abuali, 2010; Alshehri and Drew, 2010; ICEGD, 2002; Lee, 2005; OECD, 2003; Yesser, 2005, 2013).

Interviewees felt that availability and integrity of the national e-Government programme is a vital factor and necessary for shared understanding to achieve OEGR. However, alongside with the positive assessment of the potential impact that Yesser may have on the e-Government services, interviewees assessed its current state of development very poorly, for example:

> The idea of establishing Yesser is excellent but the implementation is slow which has affected readiness progress. (Interviewee #4)

> Nowadays, each ministry has independent applications and networks. Each ministry works and develops its own ICT infrastructure independently. These systems should be reassessed and interconnected in order to gain a complete e-Government system. This would be achieved by connecting to Yesser properly. (Interviewee #6)

> The performance of Yesser is not satisfactory as they did not even cover 40–50 per cent of their promises. This is due to a lack of qualified people and a lack of a good e-Government model to assess organisation readiness. (Interviewee #8)
>
> Yesser should offer shared ready-made applications that all government organisations use instead of each organisation implementing its own—for example, ERP. The organisation has one-way interaction with Yesser only for some queries. (Interviewee #9)
>
> Yesser should visit government organisations and offer their services and help. In addition, the lack of Yesser's power to force the public sector to transform to e-Government should be considered. (Interviewee #11)
>
> The main reason that causes the poor of performance is that Yesser is waiting for government organisations to ask them for help. The best way to ensure that organisations move towards e-Government is by assisting them in preparing strategies and plans. (Interviewee #14)

4.2.3.1 Availability

The qualitative research confirmed the need to develop SSO portals associated with the national portal to lead to effective integration of different governmental agencies in order to exchange information (Chen, 2002; Lee et al., 2005; Sharifi and Zarei, 2004; Yesser, 2005). "There is a strong need to give Yesser proper authority to ensure that public sector organisations are ready to connect via suitable SSO portals" (Interviewee #7).

Many interviewees revealed that Yesser relies on the Al Elm Security Information Company. The company uses a two-way connection in order to provide e-Services via the Yesser portal. In fact, Al Elm assumes Yesser's role in integrating between the Ministry of the Interior and other government organisations and assists the public sector in updating data and providing e-Services. This is due to the power of Al Elm as it belongs to the Ministry of the Interior.

4.2.3.2 Government security network

A network linking government agencies to the e-Government data centre should be established at the highest technical specifications and security for hosting the e-

Government programme (Yesser, 2005). In this context, the in-depth interviews confirmed the need to connect to an adequate GSN in order to share information within government organisations:

> The organisation is connecting with the GSN and government service bus which are offered by Yesser. (Interviewee #2)
>
> The organisation is connecting to the GSN and GSB. These connections allow Yesser to provide important identity details of citizens' e-Services which are required by most government organisations. (Interviewee #10)
>
> There is a delay in connecting with the GSN and GSB. The services provided through them are limited and that affected our e-Government readiness negatively. (Interviewee #3)

4.2.3.3 Government service bus

The GSB is important as a middle platform of integration and services for government e-Services and transactions (Yesser, 2005). It launches ready-made integration codes using open standard, messaging, and freely joined SOA rules (Chappell, 2004). Many interviewees stressed the need to improve and to connect to an integrated GSB:

> The GSB was established and is managed by Yesser. However, the organisation receives few benefits because of the limited services provided by Yesser. There is a need of Yesser to improve their services offered in order to benefit from other organisations' services. (Interviewee #8)
>
> Yesser does not provide either co-ordination with public sectors to ensure integrity of connecting to the GSN or GSB, or technical help or training, which affects OEGR. (Interviewee #12)
>
> The organisation has connected to the GSN and the GSB. However the benefits are few due to the limited services offered by them and the lack of compatibility and co-ordination. (Interviewee #4)
>
> The GSB offered by Yesser is not satisfactory and not able to provide the public sector's requirements to offer e-Services and share information with other sectors. (Interviewee #5)

> The GSN and GSB are not providing the expected services that government organisations need. That has affected our progress in providing e-Services. (Interviewee #9)

Interviewees #2, 5, 3 and 10 also confirmed that the GSB and the GSN are important for integrity of Yesser systems with public organisation systems. The interviews also reiterated the need for including the integrity with Yesser in the early phases when setting an e-Government strategy (Interviewees #5, 9 and 14).

As one can see from the present analysis, multiple aspects of the e-Government program Yesser have been criticized by the interviewees, including the disappointment with the inability of Yasser to fulfil the promise of many easy and usable services, a very harmful delay in integrating with the GSN and GSB causing limitations in e-Government operation. Therefore, taking these technical aspects' crucial role for the OEGR, the researcher has included questions related directly to the perceived relevance of Yesser evaluation to the questionnaire.

Operationalization of the Yesser factor was undertaken in accordance with the three vital aspects of the e-Government program factors: portal availability, GSN, and GSB. For the portal availability section, the most important criteria noted by prior research included SSO availability (Forman and Thompson, 2007; Sharifi and Zarei, 2004; Chen, 2002; Lee et al., 2005), connectivity (Lee, 2010b), the range of e-services available (Alshehri and Drew, 2010), and exchange information (AlMansoori, 2010; Alshehri and Drew, 2010; Sharifi and Zarei, 2004). As for the GSN component, connectivity readiness and integration were the core to high level of OEGR (Yesser, 2005; 2013; Chappell, 2004). Similar criteria were posed for the GSB's functionality, with the addition of the common e-services' criterion, both on the basis of data from Yesser (2005, 2013) and on the basis of interviews. Thus, Table 4-4 details the items included in the questionnaire (Section 4, Appendix 9) for the national e-Government programme.

Table 4-4: Main factors of Yesser and corresponding questions

Factors	Question No.
Portal Availability	
Single-Sign-On portal	A1
Exchanges information	A2
Clashes in roles and responsibilities	A3
Direct connectivity	A4
E-Services	A5
GSN	
Connectivity readiness	B1
Integrity	B2
GSB	
Connectivity readiness	C1
Common e-Services	C2
Integrity	C3

4.2.4 Portal

E-Government portals are fundamental to allow organisations to extend e-Services to citizens, other agencies, businesses and employees integrated as single unit (Al-Nuaim, 2011; Stauffacher, 2002). Such a factor reflects the power of e-Services in an organisation. The interviewees felt it may impact on the success of the OEGR.

4.2.4.1 Availability

Availability reflects the types, levels, and number of services provided through a government public sector portal (Maheshwari et al., 2009). Portal availability is an essential aspect for e-Government services (UNDPEPA/ASPA, 2002; Yesser, 2013). Interviewees confirmed the findings in the literature that the availability of a high quality portal is necessary:

> The organisation is aware of the importance of having an advanced portal able to offer e-Services. (Interviewee #2)

> One of the important factors is a Web site portal for the organisation to offer all e-Services. (Interviewee #3)

> The organisation offers around 90% of total e-Services via the Web site portal. (Interviewee #6)

The qualitative research revealed that availability is important for the portal to be able to provide adequate accessibility, connection speed, updates and content updates (Al-Nuaim, 2011; Alotaib, 2013; Dörr et al., 2013; Maciaszek, 2004;).

> The quality of the organisation's Web site regarding the availability, accessibility, content, e-Services, update, and connection speed is very good so that led to the provision of good quality e-Services. (Interviewees #6 and 7)

On the other hand, not having these elements led to having poor e-Services:

> The quality of the authority's Web site portal is not satisfactory regarding the availability, accessibility, connection speed, update, content, and e-Services. This indicates that the organisation's e-Government readiness is low. (Interviewee #5)

> The quality of the organisation's Web site portal is not satisfactory regarding connection speed and update, content, and e-Services. (Interviewee #4)

The interviews reiterated the need for an adequate portal in the early phases when setting an e-Government strategy (Interviewees #7, 8, 10, 11, 12 and 15).

4.2.4.2 Layered structure

Layered structures are commonly used in architectural design. They facilitate categorisation of system classes into vertical hierarchies (Maciaszek, 2004). Top management confirmed the findings in the literature that it is important for organisations to implement reputable operating systems and software for the portal installed in the back-end office in order to provide a layered structure that allows organisations to offer high quality e-Services (Accenture, 2004; Al-Nuaim, 2011; Deloitte Research, 2000; Zaied et al., 2007).

> The organisation has an advanced and reputable operating system which is Linux, installed in the back-end log in order to have a high standard of portal layered structure. (Interviewee #9)

> The Web site portal uses a high level of software technology from reputable vendors which are Microsoft SharePoint (MOSS) with BizTalk that provides stronger back-end office of portal layers. (Interviewee #12)

Interviewees #2, 8, 9, 10, 11, 12, 13, 14 and 15 reiterated the need for an adequate layered structure of the portal to offer e-Government services.

4.2.4.3 Service oriented architecture

Interviewees confirmed the findings in the literature that SOA is important to OEGR. SOA reduces the dependency on back-end applications and the need to write code every time there is a change in policy because it can deal with different platforms. It establishes new software that advances the direct collaboration of e-Government users irrespective of the delivery model (Behara et al., 2009; Oracle, 2010). This confirmed the readiness of the portal in the factors of share of services supported by IT, availability of fully automated services, share of data input by database queries, and overall infrastructure.

"Yesser already applied the IBM WebSphere Portal and SOA suite in order to integrate different IT platforms (application and database) with the portal," said Interviewee #15. Interviewee #12 confirmed the need for implementing SOA: "The organisation has many different platforms. We implemented the Oracle SOA tool to ease the integration of applications, databases and portal."

The accounts of interviewees show that the Saudi Arabian public sector has managed to implement strong and well-functioning e-Government portals that advance the movement of Saudi Arabian government to the e-Government stage. Portal availability, layered structures with sound designs, and service oriented architecture are all present in government organisations. Hence, a strong link between the factor of portal arrangement and successful transition to higher OEGR levels was established.

The portal factor was operationalized with the help of such aspects as usability, content, layout, navigation, consistency, and updates (Al-Nuaim, 2011; Alotaib, 2013; Dörr et al., 2013; Maciaszek, 2004), integration into SSO (Al-Nuaim, 2011; Stauffacher, 2002), value and quality of portals (Alotaib, 2013; Accenture, 2005; Belanger et al., 2002; Molla and Licker, 2001), and availability of high-quality portals, layered structures, and SOA (Oracle, 2010; Yesser, 2005). These important aspects of the portal factor were taken into account and operationalized in the questionnaire to produce a precise assessment of Saudi Arabian portals' readiness for

OEGR. Table 4-5 details the items included in the questionnaire for portal architecture (see Section 5 of the Questionnaire in Appendix 9)

Table 4-5: Main factors of portal construct and corresponding questions

Factors	Question No.
Availability	
Use of SSO	A1
Availability	A2
Usability	A3
Layout	A4
Navigation	A5
Consistency	A6
All information available on the Web site	A7
Layered structures	
Communication standard	B1
Content	B2
Partially automated services	B3
Fully automated service	B4
Reputable operating system	B5
Reputable software technology	B6
Connectivity speed	B7
Service Oriented Architecture	
Single-way interaction	C1
Two-way interaction	C2
Multiple-way interaction	C3
Dealing with multiple kinds of databases	C4
Implementation of SOA	C5

4.2.5 Processes

Top management confirmed the literature review of importance of processes dimension to advance the OEGR (Azab et al., 2009; Dörr et al., 2013; OECD, 2002).

4.2.5.1 Support processes

Interviewees addressed the need for business process tools to facilitate workflow such as motives, change, workflow, documents, collaborative, integration and to verify ICT development effects (Alotaib, 2013; Molla and Licker, 2001; Lee, 2010b). For example:

> The organisation has been aware of the advantages of BPR lately and has developed a plan for re-engineering the business processes with streamline and portfolios. (Interviewees #1 and 14)

> Some business processes were changed using a BPR tool and employees were happy to use the new processes because they recognised the value of ICT in saving them time and effort. (Interviewee #2)
>
> In addition to allocating the needed resources, e-Government implementation also required a work flow change, collaborative integration and occasionally a total re-engineering of some business processes that can assist in facilitating a Web-based standard of procedures for stakeholders and minimize documents. (Interviewee #3)
>
> The organisation did not apply any re-engineering business processes tool so that delayed the progress of the organisation's e-Government readiness (Interviewee #4)

The rest of the interviewees alluded to the need to incorporate a business processes tool and that, if not incorporated, would negatively affect the OEGR.

4.2.5.2 Processes automation

All officials confirmed the importance of processes automation in OEGR by applying ICT application systems that manage and integrate the data objects to support the business functions in the business architecture (Dörr et al., 2013; Ebrahim and Irani, 2005; Macasio, 2009b; Moodley, 2003; Lee, 2010a; Lee, 2010b;).

Many interviewees confirmed the importance of implementing multiple ICT applications:

> The main ICT applications projects implemented at the organisation were core business: civil affairs systems (MGEEM, SHOMOS, TAM), appointment system, passports, traffic, training system, visa system, and ERP. (Interviewee #12)
>
> The major ICT applications projects implemented in the organisation—ERP, enrolment system, Maxeem System for maintenance, users' e-Services, and project management (under construction)—have helped the organisation a lot by improving the scale of e-Government readiness. (Interviewee #6)

> The main ICT applications projects have been implemented at the organisation are core business (Supplier Relation Management –SRM), ERP (SAP), CRM, we-based application, EAI, EDI, enterprise portal and e-recruitment. (Interviewee #13)
>
> The main ICT applications projects implemented at the organisation were core business software, ERP (ORACLE), ECM, and a new Web site portal. The organisation is, relatively, in a more advanced situation in terms of quality of information management. (Interviewee #3)

Interviewees also discussed strategies for reassessing shared application systems and interconnecting them to ensure a complete e-Government system. This process could be hosted by Yesser.

4.2.5.3 Data and information flow

Most data entry processing should take place via database query (Bazerman, 2010; Mumick et al., 1997). Interviewees felt that database query was a necessity for data and information flow. Data and information flow is important to achieve good content, accurate and shared data, timelines and convenience. Data and information flow can be achieved by applying information management tools such as: databases, data warehouses, SMS, Web site, or e-Mail (Alotaib, 2013; Dörr et al., 2013). This confirmed by (Interviewee #6 and 8). In some government workplaces, employees were incapable of assisting citizens (for instance, when following up their documents' progress or submitting new application forms) because of slow data flow, lack of accuracy and quality of data (Interviewee #12). (Please refer to interviews, Appendix 5, processes section.)

Some organisations apply data entry by self services devices by SMS and Website (Interviewee #12). In addition, interviewees confirmed that organisational e-Government strategy should include business processes at the first stage to ease implementing best practice applications that would increase OEGR. Citizens can also be notified by e-Mail or their mobile, in addition to traditional notification methods (Yesser, 2005; 2013).

The present excerpts from interviews show the need to assess the extent to which services are automated in each particular governmental agency or institution.

Therefore, questionnaire for quantitative testing of the OEGR assessment model was equipped with questions related to service automation, and a set of questions assessing the set of support services, automation tools, and information flow speed and quality.

Table 4-6 and Table 4-7show the components included in the Processes factor by the researcher upon a thorough review of literature and interviews. Inclusion of BPR for all service procedures workflow, documentation, collaboration (Azab et al., 2009; Dörr et al., 2013; OECD, 2002), together with motives, processes, integrity, streamlining and applications/systems to verify ICT development effects (Alotaib, 2013; Molla and Licker, 2001; Lee, 2010b), are strongly recommended by prior research. The whole range of processes, their applications (such as Core business, ERP, CRM, EDI, EAI Web-based and systems responsible for them has been covered by AlMansoori (2010, Sharif et al. (2005), Yesser (2005; 2013), Themistocleous and Irani (2002), Samtani and Sadhwani (2002), Meena (2009), Pan et al. (2006), Blair (2004), Seres (2010), etc., providing the technical list of processes that should be included in the model. Thus, Table 4-6 and Table 4-7 detail the items in Parts 1 and 2, respectively of Section 6 of the Questionnaire in Appendix 9.

Table 4-6: Main factors of processes construct and corresponding questions

Factors	Question No.
Support processes	
Motive	A1
Process change	A2
BPR for all service procedures workflow	A3
Documentation	A4
Collaboration	A5
Integration	A6
Streamline	A7
Complete portfolio	A8
Process automation	
Core business	B1
ERP	B2
EAI	B3
CRM	B4
EDI	B5
Web-based	B6
All systems are supported by applications	B7
Data and information flow	
The quality of data and information flow provided by the organisation:	
Content	C1
Accuracy	C2
Timeliness	C3
Convenience	C4
Data entry by self service devices	C5
Shared data	C6
Advanced databases	C7
Notification by SMS	C8
Notification by Web site	C9
Notification by e-Mail	C10
Overall quality of data and information flow	C11

As Table 4-6 suggests, the majority of criteria assessed by the "processes" such as information and process flow concern the technical features of e-Government networks available in the public sector organizations. These variables include such support processes as motive, process change, BPR for all service procedures workflow, documentation, collaboration, integration, streamline, and complete portfolio. The process automation components and quality of information flow include content, accuracy, and timeliness of provided data, as well as the convenience with which both governmental officials and citizens are able to access

it. Finally, the data entry and notification options are assessed to give the overall impression of the information flow quality.

The extent to which services are automated is also highly meaningful in the OEGR assessment, so the proportion of services available in a fully automated form was also included into the model (Behara et al., 2009; Lee, 2010b).

Table 4-7: Main factors of proportion of automation and corresponding questions

The proportion of services is fully automated	0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
The proportion of services is partially automated	0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
The proportion of services is not automated	0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

In line with the availability and quality of highly technologized processes, the OEGR model's component of processes considers automation as a key point of consideration. Therefore, the extent to which services are automated often predetermines the overall successfulness of e-Government programs' operation. Therefore, respondents were also offered an opportunity to evaluate the proportion of all services in their organizations that have already achieved a decent level of automation, for the researcher to obtain enough information informing about the progress of every analysed organization on the path towards OEGR.

4.2.6 ICT Infrastructure

All interviewees confirmed the findings in the literature that ICT infrastructure is critical to support information systems and applications that are essential for OEGR (Bakry, 2004; Center for International Development - Harvard University and IBM, 2007). For example:

> ICT infrastructure at the organisation is advanced and up-to-date including hardware, software, back up and connectivity, so that helps the organisation present e-Services. (Interviewee #6)

> The lack of ICT infrastructure is one of the major barriers to expanding the organisation's capabilities to provide e-Services and transactions. (Interviewee #14)

> ICT infrastructure is an obstacle for many government organisations to be ready for e-Government. (Interviewee #15)

However, the current state of ICT infrastructure in Saudi Arabian public sector organizations was assessed negatively in some organisations and received good evaluations in other. Each of relative factors will be reviewed in detail below.

4.2.6.1 Hardware and software

All interviewees confirmed that an e-Government could include some technologies with a network infrastructure at its backbone (Ebrahim and Irani, 2005; Fujitsu, 2011; HP, 2012; IBM, 2011; Macasio, 2009a).

> ICT infrastructure is not a major barrier to the growth of the organisations' capabilities to provide e-Services and transactions. This is due to advanced hardware, software and connectivity already applied. (Interviewee #7)

ICT software helps in ensuring the systems reliability, ease of use, accessibility, usefulness and flexibility (CID, 2007; Ebrahim et al., 2006; IBM, 2011; World Bank, 2006)

> Hardware and software at the organisation is advanced and up-to-date. We use reputable operating systems such as Linux, Unix, Windows Server, and employ compatible hardware and software standards to ensure usefulness, flexibility and reliability. Local/ national/ international levels will improve organisational e-Government readiness. (Interviewee #8)

> The software at the organisation is important to achieve reliability of systems, easiness and accessibility. This advances implementing ICT infrastructure projects and speed up the organisation's e-Government readiness progress. (Interviewee #11)

4.2.6.2 Connectivity

This qualitative research confirmed the importance of connectivity through necessary technologies such as LAN, WAN, high speed lines, VoIP and home and work access (IBM, 2011; Macasio, 2009a; World Bank, 2006).

> The new ICT infrastructure projects include the organisation's LAN, WAN (530 offices), renewed servers, a new backup system and e-Mail to ensure our organisation e-Readiness. (Interviewee #8)

Interviewee #1 stressed the importance of hardware, software and connectivity:

> Although the organisation's hardware, software and connectivity are highly developed, there is a problem in connecting to some specific small towns and villages through ISPs which has affected the organisation's e-Readiness.

Interviewee #4 confirmed the significance of LAN, WAN and high speed connections:

> Currently the organisation is implementing new projects to develop the ICT infrastructure such as building a new data centre, LAN, WAN and high speed connection with all branches.
>
> However, the external connectivity is the major barrier due to lack of ability of the communication companies. So that caused a delay in implementing some ICT infrastructure projects. (Interviewee #5)

Interviewee #12 revealed that some rural areas suffer from lack of connectivity

> There are some difficulties in connecting to some rural areas also in upgrading slow speed of leased and IP-VPN lines.

Interviewee #7 confirmed the importance of VoIP and home and work access (IBM, 2011; Pfleeger and Pfleeger, 2003; Zaied, 2007):

> There are also new project to expand the ICT infrastructure, reformate and modernize the data centre, implementing integrated communication systems including VoIP to reduce cost of call. There is intranet connectivity and digital interaction between all departments and ability to access specific applications from home over IP-VPN.

4.2.6.3 Security

This qualitative finding revealed that ICT security is one of the most important factors and that organisations should emphasise solid security tools, policies and

awareness to protect their information assets (Conklin et al., 2004; Ebrahim and Irani, 2005; Pfleeger and Pfleeger, 2003).

> ICT security is vital for e-Government organisational readiness and should be viewed as a priority. Any security breach would not only damage the organisation's systems, but its image and credibility. (Interviewee #1)

Interviewees #9 and 12 confirmed the need for ICT security policies and awareness: The organisation has advanced ICT security solutions and policies which are certified by ISO, also has an awareness programme of security risk.

4.2.6.4 Operations

The in-depth interviews confirmed the need for operations and maintenance processes to assist in monitoring and maintaining ICT infrastructure including daily work such as backup, user support, also ensure updating and upgrading the systems (CID, 2007; Patrizio et al., 2004; World Bank, 2006)). Interviewee #12 confirmed the importance of having disaster recovery: "The backup and DR systems are upgraded and updated regularly due to their importance." (CID, 2007; Patrizio et al., 2004; World Bank, 2006). Interviewee #15 stressed how daily maintenance is fundamental for e-Readiness: "Day-to-day operation and maintenance are essential for any IT department to resolve daily issues." (Gil-Garcia and Pardo, 2005; Patrizio et al., 2004).

Interviewees #4 and 9 confirmed the significance of implementing a help desk to handle technical issues: "A technical help desk is vital to fix technical issues such as PCs, printers, networks and applications."

Interviewees confirmed that technical support can play a significant role in resolving issues for the entire IT community to achieve e-Government readiness (Patrizio et al., 2004):

> An e-Services help desk is available via the call centre 24/7 and offers a dedicated assistant call number which is 777. (Interviewee #10)

> The organisation established a help desk working 24/7 with 40 employees to assist employees and other stakeholders. (Interviewees #4 and 12)
>
> The organisation created a user and technical support department a long time ago. A user satisfaction department has been created recently in Jubail and Yanbu city. (Interviewee #1)

This qualitative research also revealed that some organisations are more ready than others in ICT infrastructure in Saudi Arabia. The average for the fifteen organisations falls between 3 and 6 (out of 7) for internal capacity to pursue the following: quality of software applications, quality of connectivity, quality of ICT security, quality of hardware, and quality of technical support.

Despite the plans to enhance the country's ICT infrastructure, many officials stated that it is still deficient in rural areas, and that integration between organisations and branches is not satisfactory.

Interviewees confirmed that a successful e-Government strategy that includes public sectors to create an appropriate ICT infrastructure is required in order to support eventual e-Government readiness.

As one can see, there are some specific issues related to the ICT infrastructure factor associated particularly with the context of a developing country like Saudi Arabia. For instance, alongside with heavy funding into the hardware and software, as well as computer security, perations, there are unexpected problems in the field of staffing and connectivity in the distant rural regions. Therefore, the factor of ICT infrastructure should be thoroughly assessed within the preparation of the OEGR evaluation model.

Operationalization of variables pertaining to the aspect of ICT infrastructure related to technical features identified by previous researchers. Thus, criteria for the assessment of quality of hardware were taken from the findings of IBM (2011) specialists, Macasio (2009a), and World Bank (2006). At the same time, features of software quality were elicited from the studies of CID (2007), Ebrahim and Irani (2005), and HP (2012). Some recommendations on software assessment were

borrowed from CID (2007), Ebrahim et al. (2006), and World Bank (2006). Connectivity criteria were formulated on the basis of findings of IBM (2011), Macasio (2009a), and World Bank (2006). Security ((Ebrahim and Irani, 2005; Pfleeger and Pfleeger, 2003) and operations (Patrizio et al., 2004; CID, 2007; World Bank, 2006) variables were also compiled on the basis of prior research articles. Table 4-8 details the items included in the questionnaire for ICT infrastructure Section 7 of the Questionnaire in Appendix 9).

Table 4-8: Main factors of ICT infrastructure construct and corresponding questions

Factors	Question No.
Quality of Hardware	
Desktop users	A1
Compatibility within departments	A2
Compatibility with other agencies	A3
Hardware standards	A4
Overall quality of hardware	A5
Quality of Software	
Reliability	A6
Ease of use	A7
Accessibility	A8
Usefulness	A9
Flexibility	A10
Suitable and reputed operating systems	A11
Software standards	A12
Overall quality of software	A13
Connectivity	
ICT communication network	B1
Coverage of LAN	B2
Coverage of WAN	B3
Internet users	B4
Employee's home access	B5
Rural Areas Connectivity	B6
Percentage of high-speed access to the Internet	B7
VoIP	B8
Security	
ICT security policies	C1
ICT security awareness	C2

Factors	Question No.
Regular ICT security assessment	C3
User's authentication	C4
User's authorisation	C5
Encryption	C6
Operations	
ICT day to day work plan	D1
Technical support	D2
Redundancy	D3
Disaster recovery	D4
Updating and upgrading	D5

4.2.7 Human Resources

Interviewees felt that having qualified people is critical for organisational e-Government readiness, for example:

> The IT department adopts a dynamic policy regarding its human resources with an objective to choose the right employees to implement the e-Government strategy. (Interviewee #12)

4.2.7.1 Awareness

Interviewees confirmed the importance of e-Government awareness for public OEGR (Zaied et al., 2007; Azab et al., 2009; DeLone and McLean, 2003).

> The policy makers have a high level of awareness of the benefits of e-Government. However the department and section managers have less awareness. Also, the awareness of users is low and should be considered to avoid delay in transforming to e-Government. (Interviewees #2 and 15)

Interviewee #14 stressed the need of roles and determines responsibilities to build awareness: "We need to set roles and responsibilities to increase ICT awareness in the organisation for long term benefits."

Interviewees gave support to the importance of ICT management to encourage desirable behaviours to reduce resistance to change and to increase e-Government knowledge (APEC, 2008; Azab et al., 2009). For example:

> Some government organisations are more ready than others in the adoption and diffusion of e-Government in Saudi Arabia due to top management support. (Interviewee #3)

> Senior managers who support e-Government adoption lead to accomplishing a good level of organisation e-Readiness. (Interviewee #6)

> Top managers who do not have the authority to motivate the adoption of e-Government caused another challenge in e-Readiness. (Interviewee #11)

4.2.7.2 ICT Skills

Technical skills are essential for supporting ICT related work in an organisation to advance OEGR (Azab et al., 2009; Patrizio et al., 2004). Proficiency in using ICT is required to deal with new technology (Molla and Licker, 2001; Zaied et al., 2007) and in providing adequate service to citizens (Accenture, 2002; 2005).

Top management confirmed the need for educated ICT mangers and skilled ICT staff ((Molla and Licker, 2001; Zaied et al., 2007): "Lack of ICT managers who have a bachelor and above and qualified ICT staff in some public organisations cause a delay in e-Government readiness" (Interviewees #4, 11, 14 and 15). Also, top management revealed that it is difficult to have skilled employees.

> It was difficult to find qualified people to be involved in the e-Government projects so the organisation hired outsourced employees through contracts with private sector ICT implementers. (Interviewees #2, 8, 12 and 15)

Top management addressed the difficulty of keeping qualified people because of the high salaries they can get in the private sector:

> One of the major factors affecting e-Readiness is difficulties in keeping qualified IT staff due to the high demand of their expertise in the private sector. It offers reward packages superior to those provided by the government. (Interviewees #1, 3 and 7)

4.2.7.3 Training

All interviewees claimed that, when dealing with e-Government, a major challenge for organisation e-Readiness is the lack of ICT training and skills in the public sector (Azab et al., 2009; DeLone and McLean, 2003; Yesser, 2013; Zaied et al., 2007).

> One of the major factors affecting organization e-Readiness is difficulties in keeping qualified technical IT staff due to the high demand of their expertise in private sectors that offer superior rewarding packages than those provided by the government organizations. (Interviewee #1)
>
> In this regard Yesser has been co-ordinated with the Ministry of Civil Service to provide six months IT certified training courses. The target is ninety thousand employees in different government organisations. (Interviewee #15)
>
> The organisation has its own training centre. ICDL is a UNESCO approved programme that aims to enhance people's knowledge and awareness of IT. (Interviewees #3 and 10)
>
> The organisation provides multi training courses, user guides, and technical support. (Interviewee #7)
>
> The organisation offers training courses and certificates for all employees to improve their ICT skills. (Interviewees #1, 4, 7 and 10)

Interviewees # 6 and 9 confirmed that the significant of high training to user support and maintenance staff.

Interviewees confirmed that a strategy that ensures the availability of human resources is a main factor to achieve OEGR.

As it comes from the analysis of HR factor of the formulated OEGR model, there is a specific need to pay increased attention to raising awareness of the middle and low levels of management and among users of e-Government services for the sake of ensuring better operation of the service in general. Top management support is critical in building and sustaining commitment to the transition to e-Government in any public sector organization, and it should also be ensured and controlled. The lack

of qualified ICT staff and lack of training are also distinguished factors affecting OEGR, even taking into account the fact that Saudi Arabian authorities invest heavily into ICT development and training, and can provide staff with increased professional growth opportunities in the ICT field. The competition with private sector jobs and the need to hire outsourced specialists in e-Services and ICT are also the reality of Saudi Arabian implementation of Yasser.

The HR factor of OEGR was also operationalized on the basis of the combination of prior research findings and interview analysis. E-Government awareness was operationalized in the form of resistance to change and adaptation to it (APEC, 2008; Azab et al., 2009), roles and responsibilities among employees (Macasio, 2009b; DeLone and McLean, 2003), the role of senior management (interviews; Al-Omari and Al-Omari, 2006; APEC, 2008; The Department's e-Government Framework, 2010; DeLone and McLean, 2003; Molla and Licker, 2001), and the overall impact of transition to e-Government on the employees (Zaied et al., 2007; Azab et al., 2009; DeLone and McLean, 2003). Additional variables included ICT skills (Molla and Licker, 2001; Zaied et al., 2007) and HR training and development aspects (The Department's e-Government Framework, 2010; World Bank, 2005; Carnoy, 1989; Molla and Licker, 2001). Hence, all these aspects of staffing and HR have to be included into the OEGR model for providing a precise and clear image of how human resources affect it. Table 4-9 details the items included in the questionnaire for human resources (Section 8 of the Questionnaire in Appendix 9).

Table 4-9: Main factors of human resources construct and corresponding questions

Factors	Question No.
E-Government Awareness	
Resistance to technological change	A1
Employees' roles and responsibilities	A2
Middle and low management	A3
E-Government impacts on employees	A4
Adopts to change employees	A5
ICT Skills	
ICT/IT director/manager education	B1
ICT personnel	B2
Sufficiency of ICT jobs	B3
Enough qualified ICT staff	B4
Technical experience of e-Government teams	B5
HR Training and Development	
Incentives to attract and retain qualified personnel	C1
ICT assistance training	C2
Training courses	C3
Methods, tools or training	C4
Support	C5
Maintenance	C6

4.3 Inter-relations Between the Strategy and the Other Six Dimensions

The study argued that all six dimensions: user access, e-Government programme, portal architecture, processes, ICT infrastructure and human resources are affected by e-Government strategy. This strategy includes aspects that lead to major alterations of the other dimensions. Organisational e-Government strategy is seldom considered in most developing countries. Lack of strategy in e-Government projects is due mainly to a lack of vision and objectives to guide each project. A professional e-Government strategy should have a direct impact on user access, national e-Government programme, portal, processes, ICT infrastructure and human resources. Consequently, this study suggests that the strategy dimension acts as a meta-dimension—i.e. a dimension of dimensions. First, it directly affects OEGR, and secondly, it indirectly affects it through the other six dimensions. This led to the following six hypotheses:

H8a: Strategy positively influences user access delivery channels.

H8b: Strategy positively influences the e-Government programme.

H8c: Strategy positively influences the portal.

H8d: Strategy positively influences processes.

H8e: Strategy positively influences ICT infrastructure.

H8f: Strategy positively influences human resources.

4.4 **Refinement of Conceptual Model**

In order to develop a concise and applicable conceptual model, several variables and hypotheses to the conceptual model derived from the literature review were revisited following the analysis of interviews. Basically, all six categories of factors initially identified in the literature review section were found strategically important and meaningful for the achievement of a high level of OEGR. Integrity variable of the organisations' ICT systems with the national e-Government programme is essential. All interviewees stressed the need for ensuring the integrity of their organisations' ICT systems with the national e-Government programme. This relevant measure was included as a result in Table 4-1, in the section on strategy, plans and development and included also in the national e-Government programme, GSN and GSB (Table 4-4). Clashes in roles and responsibilities variable also included in Table 4-4 under availability factor due to the conflict of roles and responsibilities between Yesser and Al Elm.

The analysis of interviews pointed to other potential variables of support processes: the need for collaboration with other public agencies to solve problems, improve service delivery, or streamline workflow, and a complete portfolio for analysis thorough re-engineering of workflows and processes in the organisation (Interviewee #1). The WebSphere portal that supports security, e-Payment, and data warehousing is offered by systems accessed from all major business processes (Interviewees #12, 6 and 3). Interviews alluded to other variables of data flow such as standards-based Web services that can share data across agencies (Interviewee #3). Relevant variables measures were included as a result in Table 4-6 for processes.

This hardware and software scale which included a measure of availability has been established. However, based on the findings from the exploratory interviews, it was

found that suitable and reputed operating systems were already installed on the servers, together with hardware and software standards to enhance OEGR (Interviewees #3). Also, interviewees revealed that the cconnectivity in rural areas in Saudi Arabia is an issue. As a result, relevant measures were included in the Table 4-8. The major problem associated with hardware and software surprisingly turned out to be its manipulation, which revealed the in-depth problematic issue with HR and ICT staffing.

Interview analysis nevertheless also showed that not all factors produced a comparatively equal impact on the establishment of OEGR, and there was a certain hierarchy of impact. The e-Government strategy turned out to be a pervasive factor affecting all other factors as well as OEGR level, so its hierarchical superiority caused the need for the model's refinement. Our study argues that all six factors— user access, national e-Government programme, portal, process, ICT infrastructure, and human resources— are affected by the seventh factor, which is e-Government strategy. This strategy can cause a ripple effect to the other six factors. An efficient e-Government strategy, should directly impact them, which leads to the conceptual model developed in the next section.

Following the qualitative exploratory phase, the conceptual model from the literature review clearly identifies a number of hypotheses that represent current gaps in the literature. Figure 4-1 shows the revised version of the suggested OEGR model containing the first seven hypotheses (presented earlier in the model in figure 2.6 in Chapter 2), in addition to the last six hypotheses (H8a, H8b, H8c, H8d, H8e, H8f) explained above. This study now proposes to investigate empirically as shown in Figure 4-1.

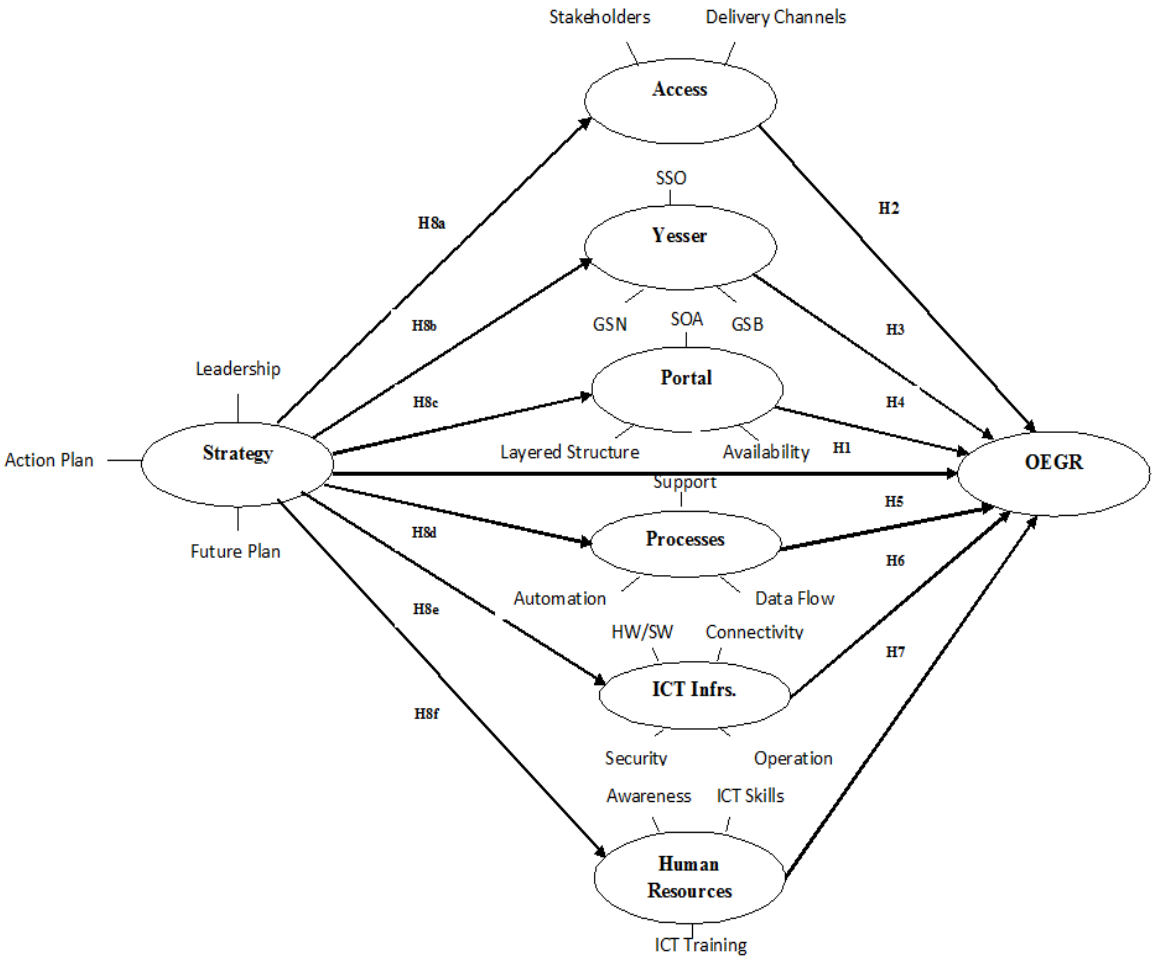


Figure 4-1: Conceptual model (revised version)

This study hypothesises that the organisational e-Government strategy and e-Government programmes should be regarded as equally important components of e-Readiness assessment. The study also hypothesises that the e-Readiness tools should clearly reflect this fact in their models in addition to ICT, business considerations, users and regulatory factors.

Owing to the relationship between strategy and other dimensions, the literature review argues that all six dimensions are influenced by e-Government strategy. This strategy has features that lead to key changes in the declared six dimensions. An effective e-Government strategy is expected to impact on the mentioned dimensions, which leads to the six additional hypotheses—8a to 8f—of Table 4-10.

Table 4-10: Thirteen hypotheses

Hypothesis	Independent variable	Dependent variable	Predicted relationship
H1	**Strategy**	OEGR	+
H2	**User access**	OEGR	+
H3	**Yesser**	OEGR	+
H4	**Portal**	OEGR	+
H5	**Processes**	OEGR	+
H6	**ICT infrastructure**	OEGR	+
H7	**Human resources**	OEGR	+
H8a	**Strategy**	User access	+
H8b	Strategy	Yesser	+
H8c	Strategy	Portal	+
H8d	Strategy	Processes	+
H8e	Strategy	ICT infrastructure	+
H8f	Strategy	Human resources	+

4.5 **Summary**

This chapter discussed the important factors that emerged from the qualitative research. The interviewees confirmed all the hypotheses and the importance of the six dimensions and how they are affected by e-Government strategy. Interviews were conducted with the aim of exploring and validating the variables and providing a preliminary identification of organisational e-Government readiness. The findings from the qualitative research were subsequently discussed. The qualitative research assisted in refining the conceptual model and developing the hypotheses. The refining of the research instrument in the qualitative interviews was important to use later in the quantitative stage. The next chapter provides a quantitative analysis of the data obtained from government organisations in Saudi Arabia.

Chapter 5: Quantitative Results

5.1 Overview

This chapter introduces the details and results of the descriptive analysis and analysis of measurement scales used in the survey questionnaire to measure the constructs suggested in the conceptual model. Each of the seven measurement scales of the model constructs was evaluated to verify its reliability. Factor analyses were carried out on each scale to prove factor structures that correspond to each model construct—a fundamental step before evaluating the conceptual model. The chapter starts with Sections 5.2 through 5.6 that explain the data screening processes and techniques, results regarding of the normality and outliers of the dataset, and the standard deviation and standard error of the mean. The main reason for performing the data preparation was to guarantee that the dataset: 1) had no missing values; 2) was free of excessive outliers; 3) was not vague from the diverse views of particular groups; and 4) supported the standards of normality, linearity and homoscedasticity.

Section 5.7 provides the details and results of the analysis of scale reliability through the assessment of internal consistency and item-total correlations.

Section 5.8 presents the procedures and results of the exploratory factor analysis performed to validate the factor structures of the model construct and evaluate the common method variance.

Section 5.9 presents the details and results of the confirmatory factor analysis conducted on the identified structure of each model construct to confirm its reliability, validity and unidimensionality.

This chapter also presents the detailed procedures conducted to assess the conceptual model developed in Chapter 4. This analysis phase was performed following the proving of the validity, reliability and unidimensionality of the model constructs explained above.

Section 5.10.1 is an overview of the structural equation modelling used as the technique for assessing the relationships between the model's constructs. The section details the sequential assessment of the two main SEM components: a measurement

model and a structural model. The first component, presented in Section 5.10.2, focuses on specifying the measurement model and producing the assessment results. Section 5.10.3 presents the second component by detailing the structural model specification and its assessment results.

Finally, Section 5.11 summarises the chapter.

5.2 **Descriptive Statistics**

This section uses basic frequency distribution techniques to describe the characteristics of the survey participants. As mentioned in Chapter 3, the sample was chosen to represent those people most likely to be the targeted users of e-Government in Saudi Arabia. Thus, the ultimate aim of this analysis was to isolate the defining characteristics of these people by using information gathered from surveys and interviews. The respondents' demographics and organisation information is summarised in Figure 5-1 to 5-8 and Table 5-1 and Table 5-2.

Figure 5-1 shows 438 participants who responded from 50 different government organisations in Saudi Arabia. Fifteen respondents were from the Ministry of Commerce and Industry, and twelve each were from Hail University, the Ministry of Justice and Almadinah Islamic University. There were 7 to 11 respondents from another 46 organisations.

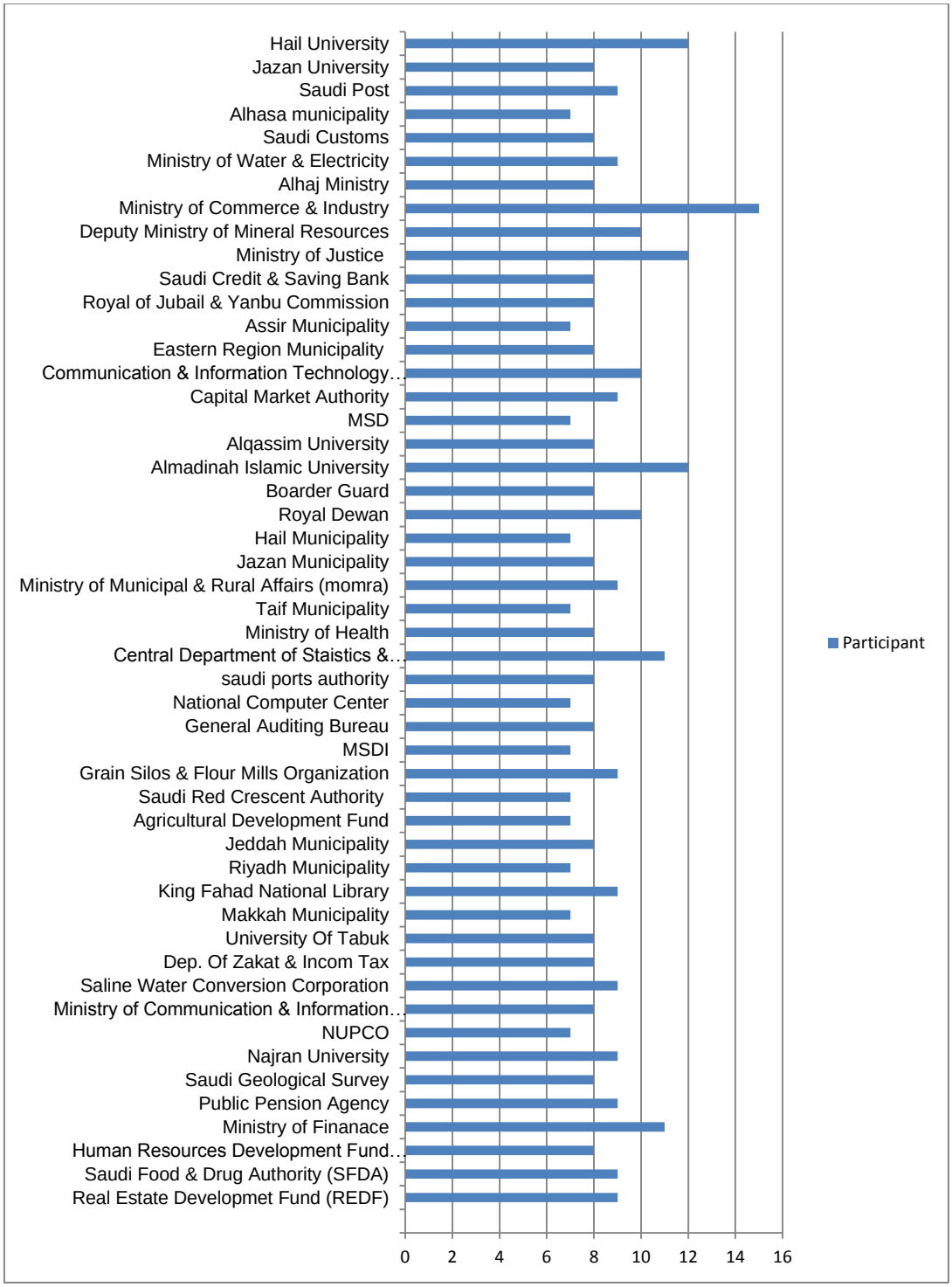


Figure 5-1: Government organisations and participants involved in this survey

Figure 5-2 illustrates the 12 different employment positions involved in this survey. About 22% of the participants were IT managers, 13% electronic services department managers, 12% IT development and application managers, 10% IT consultants, 9% steering committee of e-Government managers, 7% system designers and analysts, 7% computer programmers, 6% IT project managers, 5%

network department managers, 4% IT help desk managers, 4% IT planning managers and 1% chief information officers (CIOs).

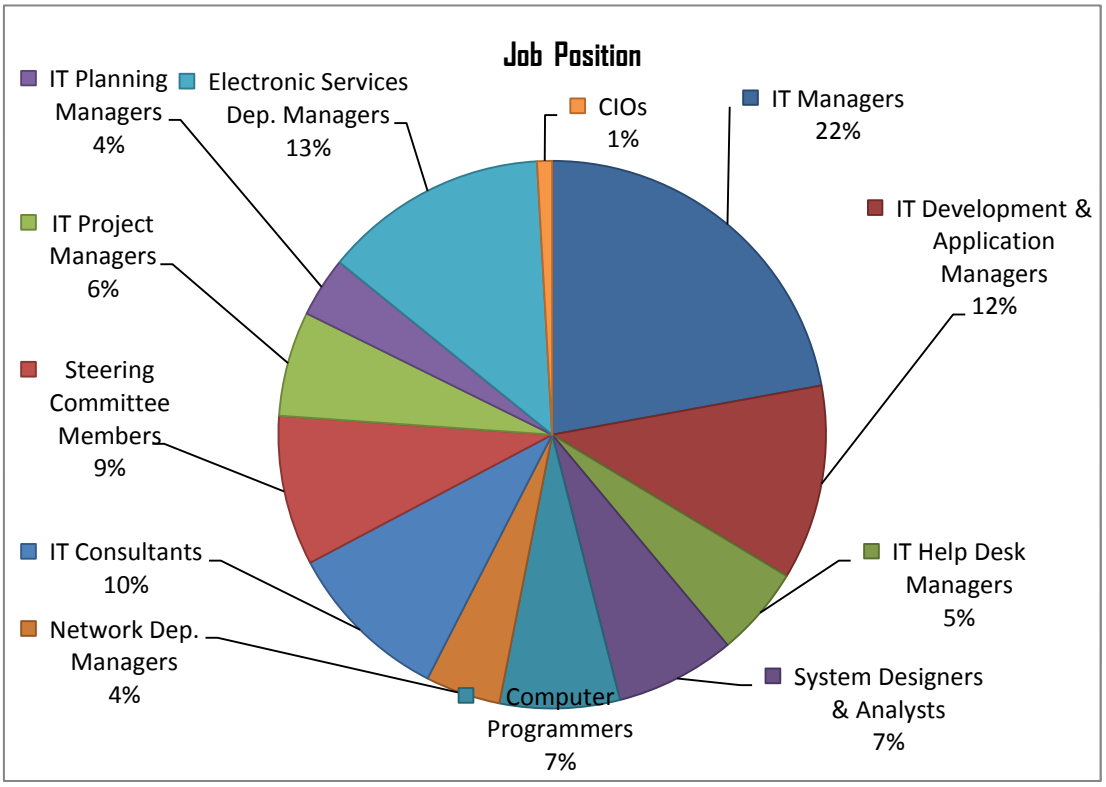


Figure 5-2: Survey participants: Distribution according to job position

Figure 5-3 shows that respondents were from 15 different cities from Saudi Arabia. Seventy-seven per cent of the respondents were from Riyadh, the capital, with most ministries located there. Five per cent of the participants were from Jeddah, which is the second largest city in Saudi Arabia, while the rest of the respondents fell in the range 1 to 3 per cent from 13 other cities.

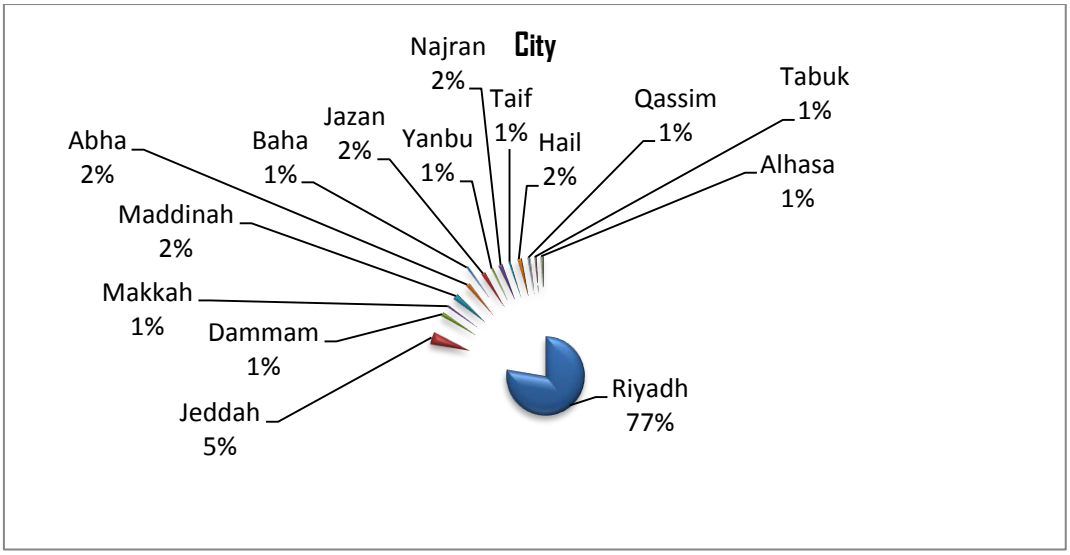


Figure 5-3: Survey participants: Distribution according to city

Figure 5-4 shows the distribution of survey participants against organisation. The portion of participants among employees was found to be reasonable at 8% for less than 100 employees per organisation, but the rate tended to increase when moving up: at 100–500 employees it was 18%, then 27% at 501–1000. The rate dipped when we moved higher: at 1001–2000 and 2001–5000 it was 20 and 21 per cent, respectively.

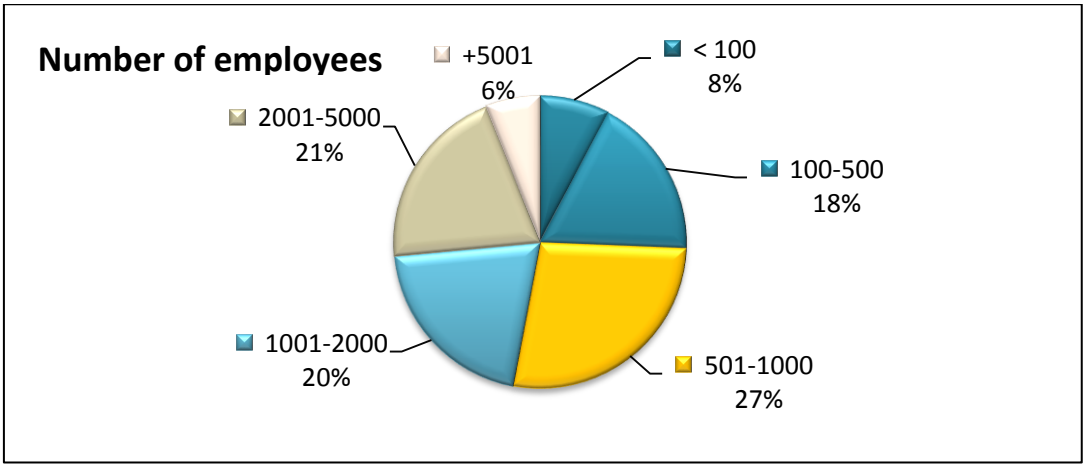


Figure 5-4: Survey participation by number of employees

Figure 5-5 illustrates the distribution of participants according to the number of branches of each organisation. The rate was a reasonable 5% per cent for an organisation which had no branches. Rates tended to increase rapidly to 86% when moving up to 50 branches. Rates plummeted back when moving to 51–100 and above 100: 3 and 6 per cent, respectively.

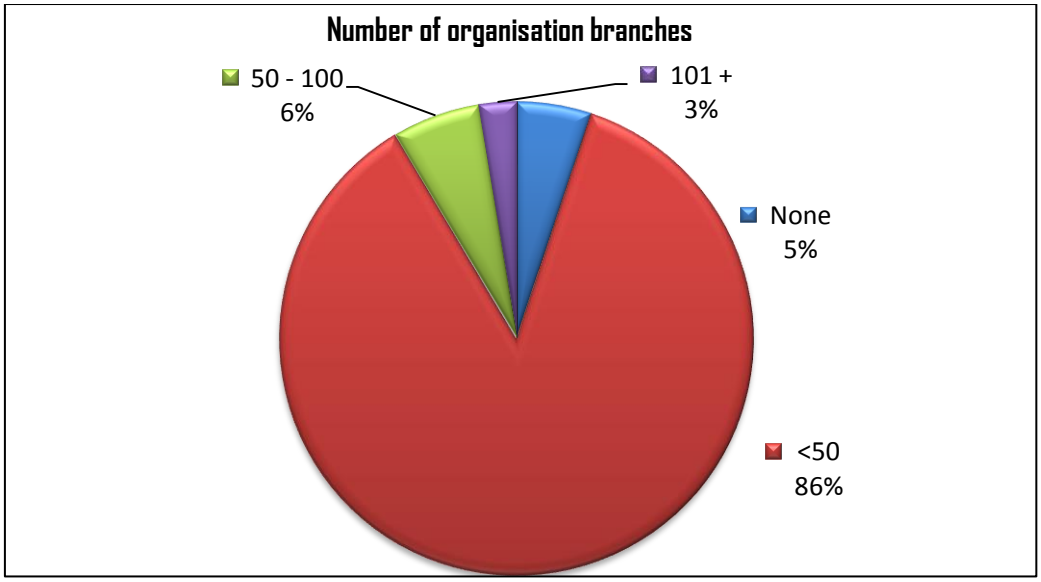


Figure 5-5: Survey participation by number of branches

Figure 5-6 shows the distribution according to all services (manual and automatic) offered by the organisation. The rate was a high 75% for organisations offering fewer than 50 services, but tended to decrease when we moved from 50–100, 101–200 and above 201 at 8%, 10%, and 4% respectively. In general, this indicates the low number of manual and automatic government organisations offered.

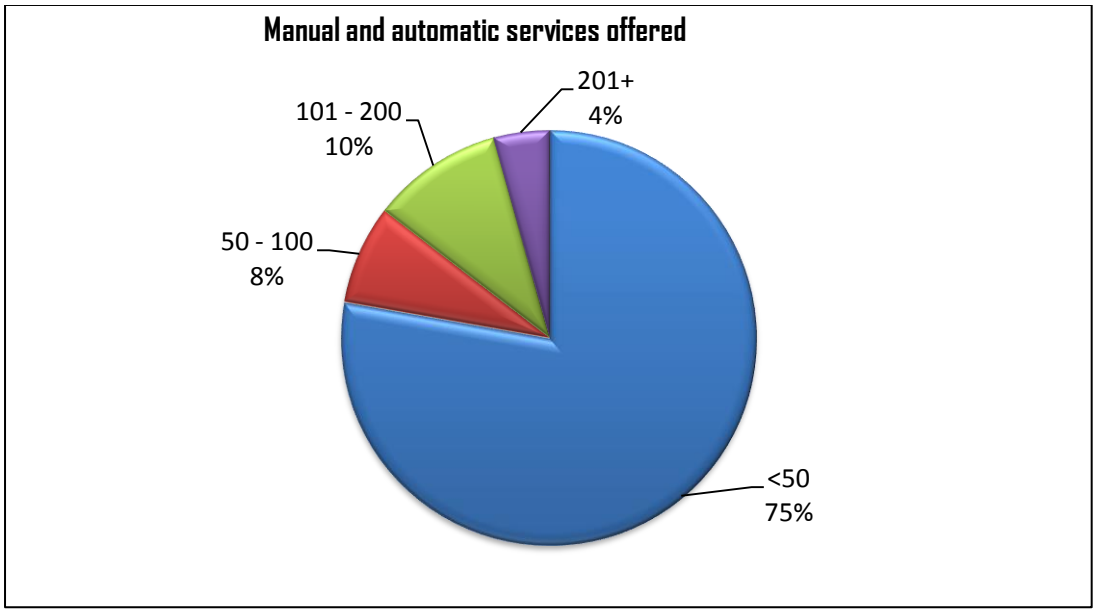


Figure 5-6: Survey participation by number of services offered

Figure 5-7 shows the distribution of e-Services in the surveyed government organisation against the dependent variables G2C, G2G, G2B and G2E. A percentage of e-Services for organisations don't offer any services G2C, G2G, G2B and G2E were 14%, 24%, 37% and 40% respectively. A percentage of e-Services for organisations offer services between 1-25: G2C, G2G, G2B and G2E were 35%, 33%, 18% and 14% respectively. The results show that the numbers of e-Services offered for organisations offered 26 to 50 services fell between 3 and 79 per cent. The results show that the numbers of e-Services offered for organisations offered 51 to 75 services fell between 3 and 59 per cent.

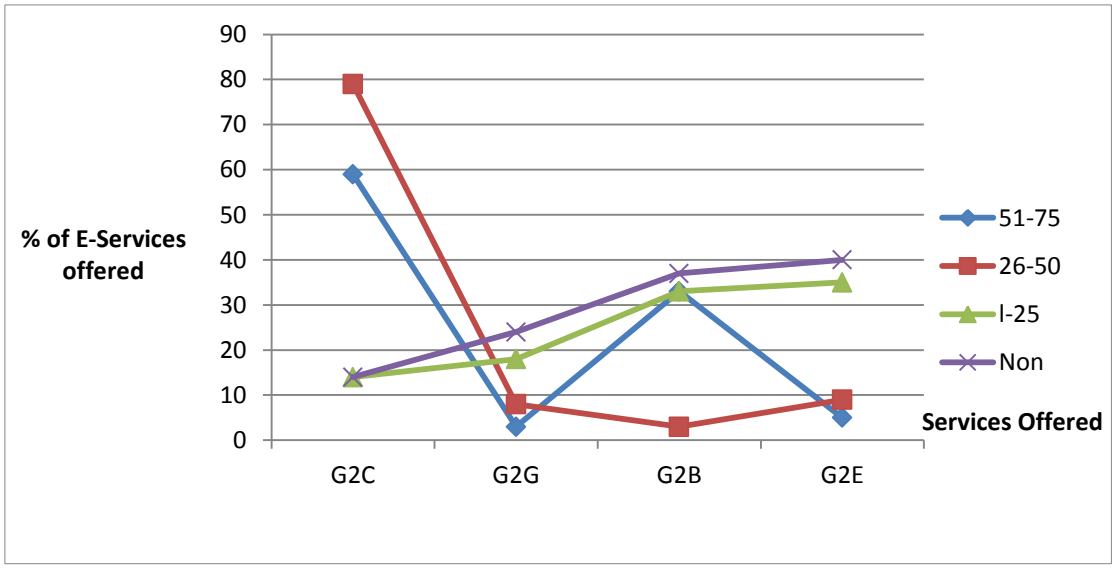


Figure 5-7: Distribution of e-Services in participating government organisations against variables G2C, G2G, G2B and G2E

Figure 5-8 shows the distribution of services in government organisations against the dependent variables of fully, partially, and not automated. In terms of e-Services, the rate was low for organisations that offer services between 1 and 25: between 1 and 69 per cent. Results show that, for 26–50 services offered, fully, partially and not automated is at 21, 39 and 40 per cent respectively. The respective portions for between 50–75 services offered are 27, 29 and 44 per cent. Results show that automation of services requires more effort to achieve strategic goals in providing a reasonable percentage of fully automated services.

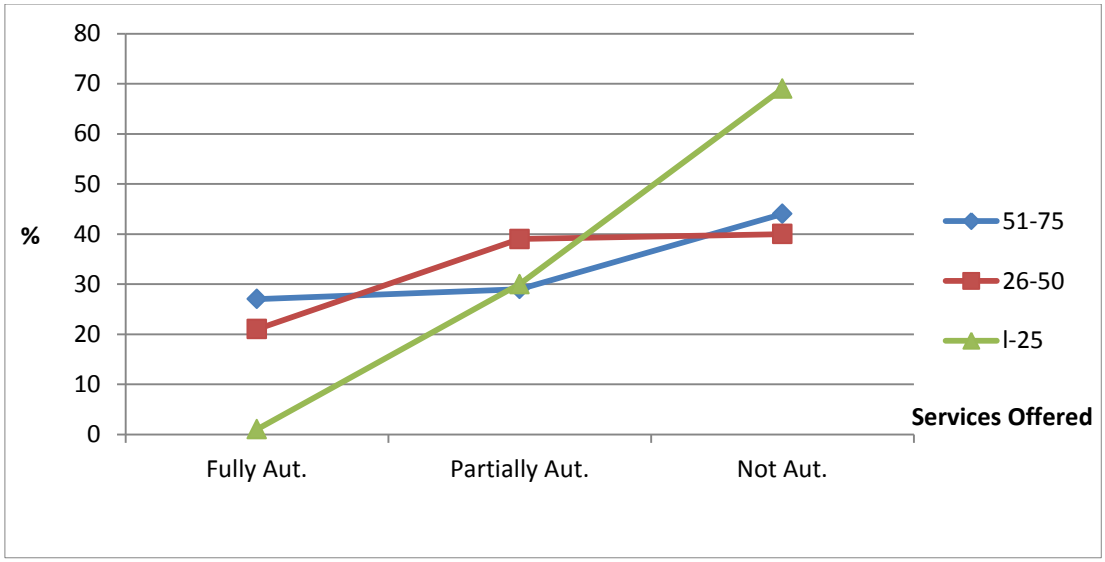


Figure 5-8: Distribution of services fully, partially, and not automated

When investigating network coverage, results show that around 81% of government organisations have over 80 desktop computers per 100 employees, and the network coverage of LAN and WAN is high at 81% and 78% respectively. The ease of access to ICT is also high at 80%. Between 61 and 69 per cent of employees have access to Internet and e-Mail, while the employees' access to PCs through the home (>5%) is relatively low (around 45%).Connection speeds were reasonable, falling between 60–74% (see Table 5-1).

Table 5-1: Distribution of desktop and network coverage, e-Mail and Internet usage, and connection speed

Item	Percentage within the organisation
Desktop users within the organisation (>80%)	81
LAN coverage over the organisation (>80%)	81
WAN coverage over the organisation's branches and customers (>80%)	78
Ease of access ICT communication network	80
Employees who use e-Mail **internally** in all departments and sections	69
Employees who use e-Mail **externally** with all the government and the private sectors	61
Internet users within the organisation (>80%)	62
Employee's access to PCs through the home (>5%)	45
Connection speed supported by organisation's infrastructure (385kbps–0.5Mbps)	74
Users who have dedicated or other high-speed (>4Mbps) access to the Internet (>50%)	60

Computer skills in government organisations fell between 44 and 52 per cent. ICT security training and methods, and tools or training provided to assist individuals who lack ICT skills, was a bit low at 45 and 49 per cent respectively. Training and support to keep ICT skill sets current averaged 69% in contrast with the low average of training in advancing employee abilities to employ e-Services (see Table 5-2).

Table 5-2: Distribution of employees' skills and training within the organisation

Skills	Percentage
ICT/IT director/manager has bachelor or above degree in a computer field	69
ICT personnel held accountable for achieving the organisation's e-Government goals	49
The efficiency of jobs that require ICT skills	44
The efficiency of enough qualified ICT staff	46
Training	
Incentives provided that attract and retain qualified, highly ICT skilled personnel and encourage superior performance	50
Technical experience and expertise of e-Government teams (internal or partner)	47
Proportion of employees who have International Computer Driving Licence (ICDL) or Internet and Computing Core Certification (IC3)	52
Ongoing ICT security training is conducted for all relevant personnel	45
Methods, tools or training is provided to assist individuals who lack ICT skills or have special requirements for accessing electronic services	49
Training and support keep ICT skill sets current with e-Government developments	69

As it may be seen from the overview of the descriptive statistics of the respondent sample, the composition of this work's sample is quite diverse and varied, which ensures a strong possibility of getting a representative dataset. More than 50 governmental organizations were included into the sample, with the major portion of respondents from the Ministry of Commerce and Industry, Hail University, and the Ministry of Justice of Saudi Arabia. The major part of respondents in the sample belonged to the IT field, including IT managers, IT development and application specialists, system designers, analysts, and other professionals of e-Government establishment. The majority of the sample indicated having from fair to high level of training and skills, as well as providing a range of e-Services to their users. Therefore, their responses may be considered authoritative in the current field of researcher's interest.

The present section has shown the socio-demographic distribution of the sample alongside with the professional data about respondents' qualifications and

involvement in the IT sphere and the progress towards OEGR. However, this was only the initial stage of qualitative data analysis. The next sections in this chapter will provide relevant details about the process of qualitative data collection and analysis, as well as the process of eliciting variables for the OEGR model on the basis of the respondents' qualitative estimates unified with the preliminary literature review findings. On the basis of these analytical inferences, hypotheses for the next quantitative phase of research will also be formulated.

5.3 **Data Screening**

The survey was conducted over a three-month period. Surveys were distributed to 1,194 participants representing most of the Saudi Arabian government sector as illustrated in Section 3.5.2. A total of 464 responses were received. The response rate of 438 was a modest 39%. Twenty-six incomplete responses were discarded. They were incomplete due to three reasons as noticed: 1) fear of criticising their organisations through some of the issues addressed in the questionnaire; 2) the length of the questionnaire (11 pages with 139 variables) discouraged some participants; and 3) some of the participants did not have a complete idea about all the issues, particularly those mentioned in the first section relating to the strategy dimension.

The descriptive statistics for the variables of each construct on factors are illustrated in Table 5-4.

5.4 **Assessment of Normality**

Assessment of normality was essential as the current study used various statistical analysis techniques that required an assumption of normality (Neuman, 2011). The assessment of normality facilitated a preliminary display of the data distribution for each variable to determine and justify the employment of particular statistical analysis processes. Researchers adhere to 'skewness' and 'kurtosis', which are the most important elements of normality (Tabachnick and Fidell, 2007b). A distribution of skewness and kurtosis should fall between +2.00 and -2.00 to be considered normal (Neuman, 2011). Table 5-4 shows that the skewness of all variables ranged from -1.32 to +0.96, while for kurtosis values ranged from -0.93 to +1.98. Thus all variables fell within the recommended range of ±2.00.

Alternatively, a non-significant value of either Shapiro-Wilk's *W* or Kolmogorov-Smirnov's *D* test can be utilised as a sign of normality. These test statistics are shaped to the sample size, also suggesting that researchers test the data's histogram (Neuman, 2011). Investigating the distribution histograms of all the variables confirmed that the forms of the distributions were normal, with scores taking place in the centre. These results, together with examination of the data's histogram, supported data normality.

5.5 **Outlier Screening**

Statistical outliers are cases having scores that are significantly different from the major bulk of data (Hair et al., 2010). As a result, it is vital to screen the data to identify outliers, as they can bias the mean and increase the standard deviation (Neuman, 2011). Cases with scores of more than three standard deviations above the mean may be considered as outliers (Hair et al., 2010). To find the extreme deviation values in this research, the complete scores of the 138 variables for all cases were converted into standardised z-scores. Any case with a z-score having an absolute value (|z|) greater than 3.29 (i.e. three standard deviations at $p<0.01$) were considered potential outliers (Tabachnick and Fidell, 2007b). The results showed no outlier values above 3.29.

The three values that exceeded 3 were below the recommended z-score of 3.29 (3.19, 3.10 and 3.16). The difference between the mean and the 5% trimmed mean of each variable was checked in order to confirm that these high values did not significantly misrepresent the data. The '5% trimmed mean' refers to a mean calculated from a set of cases in which those scoring in the top and bottom 5% are deleted. The significant difference (>0.20) between the mean and 5% trimmed mean implies high values of |z| causing a problem to the data (Pallant, 2007). Table 5-4 shows that all Δ mean values indicate that the detected high z-scores did not indicate any problems with the data.

5.6 **Standard Deviation and Standard Errors of Means**

The data were coded and processed using version 19 of the Statistical Package for Social Sciences software. Descriptive analysis was performed, using standard statistical methods.

A seven-item Likert scale was used, with 1 meaning 'strongly disagree' and the others being 'disagree', 'weakly disagree', 'neutral', 'weakly agree', 'agree', and finally 7 being 'strongly agree'. The range was calculated as 7-1=6, then dividing the range by the number of items to give 6/7=0.86, which was the length of each category. This length was then added to the lowest grade of the scale, 1, so that the first category was 1 to 1.86. By adding the length of the highest limit to produce the second category and so on for the rest of the categories, the following criteria were defined for the purpose of analyzing the results:

Table 5-3: Criteria of analysing each category

Criteria	Category
1 to 1.86	Strongly Disagree
>1.86 to 2.73	Disagree
>2.73 to 3.60	Weakly Disagree
>3.60 to 4.47	Neutral
>4.47 to 5.34	Weakly Agree
>5.34 to 6.21	Agree
>6.21 to 7	Strongly Agree

Standard deviation (SD) is used to measure how well the mean embodies the observed data, while standard error of the mean is used to indicate how well a specific sample embodies the population (Field, 2009). In analysis, a high SD indicates that the scores are more spread out around the mean; therefore the mean is not sufficient to represent the data (Field, 2009). However, a small SD indicates fewer dispersed data positions about the mean; hence the mean satisfactorily represents the data. The variability of sample mean is represented by the standard error (SE) (Field, 2009). A high SE means there is much variation between the means of the varied samples, which suggests that the sample is a poor representative of the population (Field, 2009). On the other hand, a small SE represents a condition where the majority of the sample means are similar to the population mean; thus the sample is a precise reflection of the population.

The SD values of all variables in this study were not large (0.86-2.04), and the SE values were reasonably small (0.07-0.16) when compared to the means (Table 5-4). Consequently, it is possible to surmise that the mean value can be employed as a representative score for each variable in the data. In conclusion, the small values of the SE indicate that the sample collected in this study adequately represented the population.

Table 5-4: Descriptive statistics of the factors

Variables: Description	Missing Values	Cases with $\|z\|$> 3.29	Mean	5 % Trimmed Mean	ΔMean*	Std. Deviation	Standard Error of the mean	Skewness	Kurtosis
Leadership	0.0%	0.0%	2.85	2.90	-0.05	1.14	0.09	-0.71	-0.24
Action Plan	0.0%	0.0%	2.59	2.69	-0.10	1.25	0.10	-0.95	0.40
Future Dev Plan	0.0%	0.0%	2.65	2.73	-0.08	1.26	0.10	-0.91	0.00
Stakeholders	0.0%	0.0%	2.64	2.51	0.13	2.04	0.16	0.96	1.55
Delivery channels	0.0%	0.0%	2.41	2.46	-0.05	1.55	0.12	-0.35	-0.76
Portal Availability	0.0%	0.0%	2.04	2.05	-0.01	1.61	0.13	-0.22	-0.86
GSN	0.0%	0.0%	2.28	2.29	-0.01	1.39	0.11	-0.13	-0.93
GSB	0.0%	0.0%	2.25	2.24	-0.01	1.28	0.10	-0.16	-0.85
Availability	0.0%	0.0%	3.19	3.24	-0.05	1.11	0.09	-0.74	-0.11
SOA	0.0%	0.0%	2.80	2.87	-0.07	1.23	0.10	-0.74	-0.07
Layered structures	0.0%	0.0%	2.58	2.67	-0.09	1.10	0.09	-1.32	1.69
Support processes	0.0%	0.0%	2.75	2.80	-0.05	1.14	0.09	-0.62	0.07
Process automation	0.0%	0.0%	3.10	3.19	-0.09	1.07	0.09	-1.14	1.46
Data information flow	0.0%	0.0%	2.90	2.96	-0.06	1.10	0.09	-0.71	0.03
Hardware / Software	0.0%	0.0%	2.56	2.62	-0.06	0.86	0.07	-1.20	1.98
Connectivity	0.0%	0.0%	2.90	2.93	-0.03	1.18	0.09	-0.41	-0.64
Security	0.0%	0.0%	2.82	2.87	-0.05	1.29	0.10	-0.70	-0.22
Operations	0.0%	0.0%	3.16	3.23	-0.07	1.12	0.09	-0.95	0.18
Awareness	0.0%	0.0%	2.35	2.40	-0.05	1.37	0.11	-0.45	-0.81
Skills	0.0%	0.0%	2.49	2.56	-0.07	1.47	0.12	-0.65	-0.40
Training	0.0%	0.0%	2.33	2.38	-0.05	1.34	0.11	-0.35	-0.74
OEGR	0.0%	0.0%	2.68	2.73	-0.05	1.23	0.10	-0.58	-0.46

*ΔMean=5% trimmed mean – Mean; ^{H} Highest mean value; ^{L} Lowest mean value.

5.7 **Scale Reliability**

The previous qualitative chapter discussed the source of items from the literature and discussed how the qualitative phase was used to revise and develop those measures. There were seven independent scales used in the survey questionnaire to measure the constructs proposed in the conceptual model: strategy, user access, e-Government programme, portal, processes, ICT infrastructure, and human resources (see Section 2.6). In order to guarantee that these measurement scales constantly and accurately captured the meaning of the model constructs, an analysis of scale reliability was carried out by assessing the internal consistency and item-total correlations in the following two sections.

5.7.1 Internal consistency

The measurement scale developed for the purposes of this work should be measured for internal consistency. Cronbach's alpha should be the first measure to evaluate the quality of the measurement scale (Churchill, 1979). Kline (2005) recommends as a guideline that an alpha coefficient of around 0.90 is excellent, 0.80 is very good, and 0.70 is adequate. Hair (2010) suggests that values of 0.60 to 0.70 are the minimum accepted limit. Table 5-5 shows the values of the alpha coefficient of all seven scales, ranging from 0.822 to 0.971, which were well above the acceptable lower limit and fell in a range between very satisfactory and excellent. Thus, the measurement scales ensure the consistency of a set of reliable and consistent variables for capturing the meaning of the model constructs.

Table 5-5: Cronbach's alpha values of the scales

Constructs	Number of cases	Number of variables	Cronbach's Alpha (α)
Strategy	438	23	0.971
User Access	438	10	0.822
Yesser	438	10	0.908
Portal	438	19	0.955
Processes	438	25	0.962
ICT Infrastructure	438	32	0.967
Human Resource	438	16	0.954
OEGR	438	3	0.922

5.7.2 Item-total correlation

Item-total correlation is defined as "the correlation of a variable, with the composite score of all variables forming the measure of the construct" (Lu et al., 2007). If all variables share a common core of the same construct, then the score of each variable, and that of the entire construct, should be highly correlated (Pallant, 2010). Churchill (1979) suggests that this analysis must be conducted to filter the measure by reducing 'garbage items' before identifying the factors that represent the constructs. This method helps in avoiding the creation of additional factors that can be conceptually defined. The corrected item-total correlation in SPSS excludes the score of a variable of interest when calculating the composite score (Koufteros, 1999). A value of the corrected item-total correlation of less than 0.30 indicates that the variable is measuring something different from the construct as a whole (Pallant, 2010). Table 5-6 illustrates that the results of item-total correlations of most of the variables within each construct were greater than 0.30.

Table 5-6: Item-total correlation of the factors

Variables: Description	Corrected Item-Total Correlation	Cronbach's Alpha If Item deleted *
Leadership	0.77	0.961
Action Plan	0.77	0.961
Future Dev Plan	0.82	0.961
Stakeholders	0.66	0.964
Delivery channels	0.69	0.962
Portal Availability	0.84	0.960
GSN	0.69	0.962
GSB	0.67	0.960
Availability	0.79	0.961
SOA	0.81	0.961
Layered structures	0.59	0.963
Support processes	0.78	0.961
Process Automations	0.68	0.962
Data information flow	0.84	0.961
Hardware Software	0.61	0.963
Connectivity	0.74	0.962
Security	0.72	0.962
Operations	0.74	0.962
Awareness	0.78	0.961
Skills	0.71	0.962
Training	0.81	0.961
OEGR	0.81	0.961

* To be compared with Cronbach's alpha of the scale (0.861); $^{+}$ Correlation < 0.300.

5.8 **Exploratory Factor Analysis**

An exploratory factor analysis was performed to assess scale reliability by reducing the large number of variables to more appropriate factors (Gerbing and Anderson, 1988; Hair et al., 2010). EFA is especially helpful as a preliminary analysis in the absence of an adequately detailed theory regarding the relations of the variables to the underlying constructs (Gerbing and Anderson, 1988). Even though the majority of measured variables in the constructs were obtained from previous research, EFA was considered essential as these variables had not been operationalized comprehensively within the Saudi Arabian context. Thus, each of the model constructs was measured by an independent scale; the EFA was performed individually for each construct. Sections 5.8.1 through 5.8.5 present the details of the analysis.

5.8.1 Factorability of data

Factorability of data refers to the appropriateness of the data to be factorised regarding the inter-correlation among the variables. Since the variables involved in the analysis were needed to assess the same underlying construct, a correlation matrix that was factorable was important to incorporate sizable values for the correlation (Field, 2009; Tabachnick and Fidell, 2007a). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, and Bartlett's test of sphericity, are commonly used to determine the factorability of a similar matrix.

Table 5-7: KMO and Bartlett's test values of the scales

Constructs	KMO*	Bartlett's test of Sphericity (Sig.)	Anti-image Correlation
Strategy	0.923	4392.105 (0.0000)	0.831 – 0.971
User Access	0.796	510.861 (0. 0000)	0.718 – 0.838
Yesser	0.849	1138.800 (0. 0000)	0.746 – 0.909
Portal	0.911	2733.470 (0. 0000)	0.838 – 0.949
Processes	0.898	5301.568 (0. 0000)	0.591 – 0.962
ICT Infrastructure	0.929	5494.485 (0. 0000)	0.810– 0.968
Human Resources	0.913	2449.426 (0. 0000)	0.707 – 0.977
OEGR	0.726	393.698 (0. 0000)	0.668 - 0.888

* Kaiser-Meyer-Olkin measure of sampling adequacy.

Table 5-7 shows that the values of KMO ranged from 0.726 to 0.923, above the minimum acceptable level of 0.60 (Tabachnick and Fidell, 2007a), thus representing sampling sufficiency. Furthermore, the 438 responses in this study fulfilled the minimum acceptable sample size of 100 (Hair et al., 2010). Finally, Bartlett's test of sphericity statistic for each construct was highly significant at $p<0.001$, confirming that there were satisfactory relationships between the variables involved in the analysis. Thus, the results confirmed the factorability of the EFA performed for each individual construct (Hair et al., 2010; Pallant, 2010).

The present evidence shows that the selected set of factors is appropriate for testing in this work. The formulated model represents a compilation of findings of other researchers who tested the EGR requirements in contexts other than Saudi Arabia. Therefore, the EFA should be conducted to understand the factorability of the selected items.

5.8.2 Factor extraction and rotation

In order to provide a suitable explanation that clarifies a proper number of factors representing a construct, the EFA requires pursuing two steps: 1) factor extraction; and 2) factor rotation and interpretation. Factor extraction finds factors according to a specific method and criterion to identify the adequate number of factors, whereas factor rotation enhances the interpretation of a proposed factor solution (Field, 2009; Tabachnick and Fidell, 2007a). This study used principal component analysis, which is a method commonly applied for determining the factors required to represent the structure of the variables. To accomplish this, the following criteria were utilised: 1) latent root (eigenvalue); 2) Cattell's scree test; and 3) percentage of variance (Hair et al., 2010). The latent root criterion recommends that factors having an eigenvalue greater than 1 are significant, whereas those less than 1 should be excluded. Cattell's scree test uses a graphical plot of eigenvalues against the number of factors in their sort of extraction. The idea is that an unexpected alteration of slope in the curve indicates the maximum number of factors to be extracted. The percentage of variance criterion confirms the practical significance for the derived factors, by which the particular amount of variance is explained.

It is common to employ a solution that reports for 60% (or less) of the total variance in social science research, because the information in this field, by nature, is often less accurate (Hair et al., 2010). Since the factors had been extracted, it was possible to define the degree to which the variables load onto these factors; this was achieved by assessing the factor loadings. Within the seven constructs, the preliminary factor solution did not give a sufficient interpretation, due to the majority of the variables having high loadings on the most significant factors, and small loadings on the others. Thus, a factor rotation was performed to accomplish simpler and more important solutions. Varimax orthogonal rotation was the chosen method, because it is the simplest and most-used technique (Tabachnick and Fidell, 2007a). Once the factors had been rotated, a particular criterion was used to give an explanation for the significance of the factor loadings, and so confirming a meaningful correlation between the variable and the factor (Field, 2009; Tabachnick and Fidell, 2007a; Hair et al., 2010). In order to guarantee that the variables in each factor had practical

significance, the suggested cut-off loading of 0.40 was used. The following two sections provide the results of the EFA.

5.8.3 EFA results

Derived from the above methods and criteria, EFA was performed for each of the seven constructs and OEGR as a single construct using the SPSS program.

For the strategy construct, both the eigenvalue and scree test suggested three factors, which accounted for 68.391% of the total variance. As presented in Table 5-8, the factor loadings of 19 variables were significant and well above the 0.40 threshold level without being loaded equally highly on more than one factor. Four variables of strategy–leadership– ICT-specialists-responsibilities, strategy–action-plan–e-Services, strategy–action-plan–accountability, and strategy–action-plan–policies-procedures were dropped due to their low factor loadings. They were therefore removed from the model. As a result, three factors were derived from the entire 19 variables: strategy–leadership (7 variables, component 1), –action plan (5 variables, component 2), and –future dev. plan (7 variables, component 3).

Table 5-8: Rotated factor loadings of the strategy construct–final factors

	Factor		
	Leadership	Action Plan	Future Dev. Plan
Strategy-Leadership-Business	**.768**	.285	.211
Strategy-Leadership-Vision	**.690**	.270	.480
Strategy- Leadership-Objectives.	**.592**	.418	.410
Strategy- Leadership-Challenges	**.456**	.360	.560
Strategy- Leadership-Legislation	**.843**	.046	.115
Strategy-Leadership-Involvement	**.465**	.662	.339
Strategy-Leadership-Steering-committee	**.419**	.744	.061
Strategy-Action-Plan-Stakeholders-Role	.174	**.686**	.460
Strategy-Action-Plan-Procedures	.052	**.638**	.517
Strategy-Action-Plan-Timeframe	.029	**.762**	.427
Strategy-Action-Plan-Fund	.126	**.575**	.344
Strategy-Action-Plan-Structure	.126	**.464**	.671
Strategy-Future-Dev-Plan-Delivery-Channels	.196	.538	**.672**
Strategy-Future-Dev-Plan-Integrity	.245	.562	**.592**
Strategy-Future-Dev-Plan-Portal-Architecture	.299	.390	**.666**
Strategy-Future-Dev-Plan-ICT-Apps	.267	.270	**.670**
Strategy-Future-Dev-Plan-ICT-Infrastructure	.225	.201	**.690**
Strategy-Future-Dev-Plan-HR	.282	.354	**.586**
Strategy-Future-Dev-Plan-Media-Channels	.187	.160	**.618**

Notes: Cumulative variance explained = 68.391; Cronbach's alpha = 0.971.

For user access, both the eigenvalue and scree test criteria suggested two factors, which accounted for 57.964% of the total variance. As presented in Table 5-9, the factor loadings of 6 variables were significant and well above the 0.40 threshold level without being loaded equally highly on more than one factor. Nevertheless, variables of access–G2B–e-Services, access–delivery channels–Web-site, access–delivery channels–PCs and laptops, and access–delivery channels–kiosks were dropped due to their low factor loadings. As a result, the two factors were derived from the entire six variables: user access–stakeholders (3 variables, component 1) and user access–delivery channels (3 variables, component 2).

Table 5-9: Rotated factor loadings of the user access–final factors

	Factor	
	Stakeholders	**Delivery channels**
Access-G2C-E-Services	**.611**	.478
Access-G2G-E-Services	**.580**	.478
Access-G2E-E-Services	**.665**	.193
Access-Delivery-Channels-ATMs	-.010	**.723**
Access-Delivery-Channels-WAP	.426	**.504**
Access-Delivery-Channels-Call-Centre	.133	**.827**
Notes: Cumulative variance explained = 57.964 ; Cronbach's alpha = 0..822.		

For Yesser, both the eigenvalue and scree test criteria suggested two factors, which accounted for 68.657% of the total variance. As presented in Table 5-10, the loadings of 10 variables were significant and above the 0.40 threshold without being loaded equally highly on more than one factor. As a result, three factors were derived from the entire nine variables: Yesser–portal availability (5 variables, component 1), GSN (2 variables, component 2), and GSB (3 variables, component 3).

Table 5-10: Rotated factor loadings of the Yesser–final factors

	Factor		
	Portal Availability	**GSN**	**GSB**
Yesser-Portal-SSO	**.638**	.249	.331
Yesser-Portal-Exch-E-Mail-CD-DVD..	**.821**	-.049	.421
Yesser-Portal-Roles-and-Responsibilities	**.674**	.418	.420
Yesser-Portal-Exch-Direct-Connectivity	**.696**	.332	.310
Yesser-Portal-E-Services	**.461**	.749	.320
Yesser-GSN-Availability	.703	**.557**	.430
Yesser-GSN-Integrity	.090	**.888**	.431
Yesser-GSB- Availability	.595	.538	**.621**
Yesser-GSB-E-Services	.430	.354	**.712**
Yesser-GSB- Integrity	.080	.160	**.907**
Notes: Cumulative variance explained=68.391; Cronbach's alpha=0.971.			

For the portal architecture construct, the initial principal component analysis presented a single component with an eigenvalue exceeding one, and explained 72.621% of the variance. As presented in Table 5-11, 14 variables were significant and well above the 0.40 threshold level. Five variables of Web-site–SOA–two-way, Web-site–quality–layered-structures–communication, Web-site–quality–layered-structures–updates, Web-site–quality–layered-structures–partially-automated and Web-site–quality–layered-structures–fully-automated were dropped due to their low factor loadings. As a result, three factors were derived from the entire 14 variables of portal architecture: availability (7 variables, component 1) SOA (4 variables, component 2) and layered structures (3 variables, component 3).

Table 5-11: Rotated factor loadings of the portal construct

	Factor		
	Availability	**SOA**	**Layered structures**
Website-Quality-SSO	**.443**	.405	.591
Website-Quality-Availability	**.458**	.167	.716
Website-Quality-Usability	**.620**	.229	.554
Website-Quality-Layout	**.560**	.238	.594
Website-Quality-Navigation	**.570**	.089	.665
Website-Quality-Consistency	**.658**	.344	.442
Website-Quality-Information	**.721**	.453	.245
Website-SOA-Single-Transaction	.492	**.679**	.191
Website-SOA-Multiple-Transaction	.497	**.658**	.036
Website-SOA-Multible-Database	.277	**.470**	.486
Website-SOA-Compatibility	.262	**.649**	.520
Website-Quality-Layered-Structures-Operating-Systems	.202	.236	**.837**
Website-Quality-Layered-Structures-Software	.022	.253	**.830**
Website-Quality-Layered-Structures-Connectivity	.158	.111	**.829**

Notes: Cumulative variance explained = 72.621; Cronbach's alpha = 0.955.

For the business processes construct, the initial principal component analysis presented a single component with eigenvalue exceeding one, and explained 59.96% of the variance.

Table 5-12 shows that 24 variables were significant, all well above the 0.40 threshold level. One variable was deleted during the analysis for the business processes construct due to its low factor loading: processes–auto–EDI. As a result, the three factors derived from the entire 24 variables of business processes were support processes (7 variables, component 1) processes automation (6 variables, component 2), and data and information flow (11 variables, component 3).

Table 5-12: Rotated factor loadings of the business processes construct

	Factor		
	Support Processes	**Processes Automations**	**Data and Information flow**
Support-Processes-Motives	**.485**	-.076	.722
Support-Processes-Change	**.543**	-.013	.661
Support-Processes-Workflow	**.526**	.140	.612
Support-Processes-Documents	**.426**	.353	.532
Support-Processes-Collaborative	**.481**	.349	.484
Support-Processes-Integration	**.588**	.428	.152
Support-Processes-Streamline	**.577**	.582	.082
Processes-Auto-Core-Business	-.065	**.673**	.378
Processes-Auto-ERP	.377	**.485**	.443
Processes-Auto-EAI	.144	**.704**	.430
Processes-Auto-CRM	.433	**.630**	.302
Processes-Auto-Web-based	.211	**.620**	.438
Processes-Auto-support-applications	.276	**.461**	.417
Processes-Data-Info-Flow-databases	-.011	.316	**.853**
Processes-Data-Info-Flow-Accuracy	.005	.405	**.773**
Processes-Data-Info-Flow-Software	.062	.344	**.814**
Processes-Data-Info-Flow-Timeliness	.099	.335	**.730**
Processes-Data-Info-Flow-Convenience	.148	.402	**.755**
Processes-Data-Info-Flow-Data-entry	.230	.462	**.574**
Processes-Data-Info-Flow-Software	-.162	.664	**.492**
Processes-Data-Info-Flow-Quality	.279	.174	**.518**
Processes-Data-Info-Flow-SMS	.216	.352	**.589**
Processes-Data-Info-Flow-Website	.166	.423	**.535**
Processes-Data-Info-Flow-Email	.089	.497	**.576**

Notes: Cumulative variance explained = 59.96; Cronbach's alpha = 0. 962.

For the ICT Infrastructure construct, both the eigenvalue and the scree test criteria suggested four factors, which accounted for 66.052% of the total variance. As presented in Table 5-13, the factor loadings of 27 variables were significant and above the 0.40 threshold level without being loaded equally highly on more than one factor. Five variables were deleted during the analysis due to their low factor loadings. These were infrs–connectivity–network–access, infrs–security–users–authentication, infrs–security–users–authorisation, infrs–security–vulnerabilities, and infrs–operations–DR. As a result, the four factors were derived from the entire 27 variables of infrastructure were hardware and software (13 variables, component 1), connectivity (7 variables, component 2), security (3 variables, component 3), and operations (4 variables, component 4).

Table 5-13: Rotated factor loadings of the ICT infrastructure construct

	Factor			
	Hardware & Software	**Connectivity**	**Security**	**Operations**
Infrs-H/W-Desktop	**.699**	.069	.216	.010
Infrs-H/W-Compatibility-Dep.	**.790**	.220	.142	.135
Infrs-H/W-Compatibility-Agencies.	**.777**	.251	.121	.126
Infrs-H/W-Compatibility-Standards	**.735**	.028	.046	.339
Infrs-H/W-Quality	**.625**	.292	-.127	-.064
Infrs-S/W-Reliability.	**.681**	.140	.199	.361
Infrs-S/W-Ease-of-use.	**.761**	.145	.253	.218
Infrs-S/W-Accessibility.	**.711**	.117	.125	.474
Infrs-S/W-Usefulness.	**.710**	.089	.074	.455
Infrs-S/W-Flexibility.	**.715**	.277	.041	.385
Infrs-S/W-Operating-Systems	**.707**	.120	-.102	.352
Infrs-S/W-standards	**.767**	.143	.077	.294
Infrs-S/W-Quality	**.752**	.114	.096	.453
Infrs-Connectivity-LAN	.344	**.661**	.128	.115
Infrs-Connectivity-WAN	.213	**.781**	.142	.186
Infrs-Connectivity-Internet-Users	.172	**.603**	.291	.300
Infrs-Connectivity-employee's-Access	.005	**.712**	.453	.125
Infrs-Connectivity-Rural	.620	**.410**	-.006	.360
Infrs-Connectivity-high-speed-Internet	.289	**.706**	.077	.297
Infrs-Connectivity-VoIP	.047	**.633**	.099	.238
Infrs-Security-Policies	.374	.249	**.480**	.503
Infrs-Security-Awareness	.122	.268	**.723**	.333
Infrs-Security-Tools	.101	.244	**.666**	.500
Infrs-Operations-day-to-day-work-plan	.259	.396	.290	**.544**
Infrs-Operations-User-Support	.470	.307	.038	**.467**
Infrs-Operations-Redundancy	.585	.221	.283	**.407**
Infrs-Operations-Updates-Upgrades	.326	.203	.101	**.710**

Notes: Cumulative variance explained = 66.052; Cronbach's alpha = 0. 967.

For the human resources construct, the initial principal component analysis presented a single component with eigenvalue exceeding 1, and explained 71.311% of the variance. As presented in Table 5-14, twelve variables were significant, well above the 0.40 threshold level, and 4 variables (HR–awareness–resistance, HR–awareness–employees-roles-responsibilities, HR–skills–5, HR–skills–6) were deleted during the analysis. As a result, three factors were derived from the entire 12 variables: awareness (3 variables, component 1), skills (3 variables, component 2), and training (6 variables, component 3).

Table 5-14: Rotated factor loadings of the human resources construct

	Factor		
	Awareness	**Skills**	**Training**
HR-Awareness-Management	**.815**	-.080	.027
HR-Awareness-impact-on employee	**.637**	.316	.508
HR-Awareness-adopt- to-change	**.545**	.277	.558
HR-Skills-1	-.063	**.901**	.107
HR-Skills-2	.642	**.491**	.343
HR-Skills-3	.591	**.406**	.486
HR-Training-1	.448	.254	**.757**
HR-Training-2	.514	.065	**.708**
HR-Training-3	.037	.163	**.845**
HR-Training-4	.484	.284	**.584**
HR-Training-5	.528	.144	**.599**
HR-Training-6	.445	.141	**.591**
Notes: Cumulative variance explained = 71.311; Cronbach's alpha = 0. 954.			

For the e-Government construct, the initial principal component analysis presented a single component with eigenvalue exceeding 1, and explained 60.725% of the variance. As presented in Table 5-15, all 3 variables were significant, well above the 0.40 threshold level during the analysis for the OEGR construct.

Table 5-15: Rotated factor loadings of the e-Government construct

	Factor
	OEGR
E-Government Readiness (OEGR)-1	.880
E-Government Readiness (OEGR)-2	.950
E-Government Readiness (OEGR)-3	.942
Notes: Cumulative variance explained=60.725; Cronbach's alpha=0.922.	

5.8.4 Test of common method variance

EFA was performed to uncover numbers of variables by assessing the common method variance through Harman's one factor test. In this test, the existence of a considerable amount of common method variance is pointed out when either a single factor emerges from the factor analysis, or one general variable accounts for most of the covariance in the dependent and criterion variables (Podsakoff and Organ, 1986). EFA was conducted to carry out the test on all 138 variables, according to criteria

similar to the above analysis. The results illustrate that there were 27 variables extracted, with the first factor accounting for only 39.688% (see Table 5-16). This finding suggests that the common method variance was not an issue in this study.

5.8.5 Summary of EFA results

According to the eigenvalue and scree tests, the constructs of strategy, user access, Yesser, portal, processes, ICT infrastructure, human resources and OEGR were respectively represented with three, two, two, three, three, four, three and three factors. As summarised in Table 5-17, these factor solutions were supported by the cumulative percentage of the variance extracted, which ranged from 57.964 to 72.621 per cent. Finally, the Cronbach's alpha coefficients of all scales were high and well above the 0.70 threshold level, ranging from 0.822 to 0.976, thus demonstrating internal consistency. These results therefore confirm that the developed scales comprised reliable and valid items, which adequately captured the meaning of the model constructs and their related factors.

Table 5-16: EFA results for common method variance test

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	63.104	39.688	39.688	63.104	39.688	39.688
2	13.612	8.561	48.249	13.612	8.561	48.249
3	7.002	4.404	52.653	7.002	4.404	52.653
4	5.280	3.321	55.974	5.280	3.321	55.974
5	4.362	2.743	58.717	4.362	2.743	58.717
6	3.911	2.460	61.177	3.911	2.460	61.177
7	3.569	2.245	63.421	3.569	2.245	63.421
8	3.348	2.106	65.527	3.348	2.106	65.527
9	2.965	1.865	67.392	2.965	1.865	67.392
10	2.860	1.798	69.190	2.860	1.798	69.190
11	2.538	1.596	70.787	2.538	1.596	70.787
12	2.532	1.592	72.379	2.532	1.592	72.379
13	2.348	1.477	73.856	2.348	1.477	73.856
14	2.249	1.415	75.270	2.249	1.415	75.270
15	2.086	1.312	76.582	2.086	1.312	76.582
16	1.943	1.222	77.804	1.943	1.222	77.804
17	1.719	1.081	78.885	1.719	1.081	78.885
18	1.626	1.023	79.908	1.626	1.023	79.908
19	1.594	1.002	80.911	1.594	1.002	80.911
20	1.493	.939	81.849	1.493	.939	81.849
21	1.439	.905	82.754	1.439	.905	82.754
22	1.384	.870	83.625	1.384	.870	83.625
23	1.343	.845	84.469	1.343	.845	84.469
24	1.263	.794	85.264	1.263	.794	85.264
25	1.190	.748	86.012	1.190	.748	86.012
26	1.081	.680	86.692	1.081	.680	86.692
27	1.067	.671	87.363	1.067	.671	87.363

Extraction Method: Principal Component Analysis.

Table 5-17: Summary of EFA results

Construct	Variable(s) Removed	Factor(s) Extracted	Cronbach's Alpha	Cumulative Variance	Factor: Description
Strategy	4	3	0.971	68.391	Leadership (7 variables) Action Plan (5 variables) Future Development Plan (7 variables)
User Access	4	2	0.822	57.964	Stakeholders (3 variables) Delivery Channels (3 variables)
Yesser	0	3	0.908	68.657	Availability (5 variables) GSN (2 variables) GSB (3 variables)
Portal	5	3	0.955	72.621	Availability (7 variables) SOA (4 variables) Layered Structure (3 variables)
Processes	1	3	0.962	64.142	Support Processes (7 variables) Processes Automation (6 variables) Data and Information Flow (11 variables)
ICT Infrastructure	5	4	0.976	66.052	Hardware and Software (13 variables) Connectivity (7 variables) Security (3 variables) Operations (4 variables)
Human Resources	4	3	0.954	71.311	Awareness (3 variables) Skills (3 variables) Training (6 variables)
E-Government Readiness	-	1	0.922	60.725	E-Government Readiness (3 variables)

5.9 **Confirmatory Factor Analysis**

The previous section revealed that factor structures and number confirmed the reliability of the measurement scales that relied on the model constructs. EFA offered a preliminary factor structure of each individual construct, according to the factors extracted and the pattern of loadings. Nevertheless, EFA analyses are valuable only as preliminary techniques, because they do not comprehensively evaluate construct validity and unidimensionality. Construct validity is vital in order to assess the level to which a set of measured variables represents the theoretical construct; therefore, unidimensionality reflects the presence of one particular factor underlying a set of measured variables (Gerbing and Anderson, 1988; Hair et al., 2010). To advance these results, CFA was performed to refine and support the known factor structures.

5.9.1 Assessment of model fit and estimation methods

According to the results of the EFA, first-order CFA models were proposed to assess the multidimensionality and factorial validity of the constructs of the theoretical model (Byrne, 2001). AMOS, the structural equation modelling software, was used to carry out the CFA.

As presented in Section 5.5 on outlier screening, only three of the examined variables had the z-value of the indices of skewness close to the critical values of 3.29, indicating that the data were slightly non-normal at the 0.05 probability level (Hair et al., 2010). Based on the data characteristics, ML was chosen as the most suitable method. It is robust when the condition of moderate non-normality is observed, even though the ML needing that data distribution is multivariate-normal. Furthermore, these data characteristics also justified the employment of the model fit indices χ^2/df, GFI, TLI, CFI, IFI and RMSEA. In accordance with the results of a simulation carried out by Shah and Goldstein (2006), these fit indices were not observed to be considerably biased under the situation of non-normality or sample size when conducting the ML estimation method. For the model to be confirmed as comprising an acceptable fit, all six indices were measured against the following criteria:

- $\chi^2/df<3.0$ (Hair et al., 2010, Kline, 2011);
- GFI, TLI, CFI, and IFI>0.90 (Garson, 2011; Hoyle, 1995); and
- RMSEA<0.08 (Garson, 2011; Hair et al., 2010).

5.9.2 CFA results

CFA was applied on each construct using the AMOS program. As a default in AMOS, the covariance matrix was automatically utilised as an input data set (Shah and Goldstein, 2006).

The results of each construct are presented in Table 5-18 to Table 5-25. The factor loading, *t*-value and significance level of each variable shown in the tables provide a measure for the convergent validity. The value of R^2 provides a measure by which to assess the reliability of the variables. The value of the correlation between the factors provides an indication of the discriminant validity. The model fit indices are also presented for the purpose of assessing unidimensionality.

The final CFA results of the strategy construct are presented in Table 5-18. The final fit indices of the respecified model (Figure 5-9) demonstrate a good level of fit: χ^2=179.256; *df*=117; χ^2/df=1.53; GFI=0.90; IFI=0.975; TLI=0.963; CFI=0.975; and RMSEA=0.059 (Hair et al., 2010).

All the variable loadings, ranging from 0.57 to 0.89, were greater than the threshold level of 0.50 and were all significant at $p<0.001$, demonstrating convergent validity. With the exception of four variables, all of the R^2 values were either greater than or close to 0.50, thus supporting an acceptable reliability of the variables. The variables with low R^2 values were still retained because they had substantial and high significant loadings.

The correlation coefficient between each pair of factors was less than 0.85, confirming the discriminant validity of the construct. Finally, since the fit indices of the respecified model proved to be good, unidimensionality of this construct was also established.

Table 5-18: CFA results of the strategy construct–final factors

Variables Description	Factor Loadings	*t*-value	R^2
Strategy 1: Leadership			
Strategy-Leadership-Business	0.69	f.p.	0.47
Strategy-Leadership-Vision	0.84	12.362***	0.71
Strategy- Leadership-Objectives	0.83	7.52***	0.68
Strategy- Leadership-Challenges	0.81	12.119***	0.66
Strategy- Leadership-Legislation	0.57	12.355***	0.33
Strategy-Leadership-Involvement	0.82	12.704***	0.68
Strategy-Leadership-Steering-committee	0.64	9.411***	0.41
Strategy 2: Action Plan			
Strategy-Action-Plan-Stakeholders-Role	0.85	f.p.	0.72
Strategy-Action-Plan-Procedures	0.74	9.003***	0.55
Strategy-Action-Plan-Timeframe	0.82	12.182***	0.67
Strategy-Action-Plan-Fund	0.66	10.449***	0.43
Strategy-Action-Plan-Structure	0.75	12.911***	0.57
Strategy 3: Future Dev. Plan			
Strategy-Future-Dev-Plan-Delivery-Channels	0.89	f.p.	0.79
Strategy-Future-Dev-Plan-Integrity	0.88	11.130***	0.78
Strategy-Future-Dev-Plan-Portal-Architecture	0.84	10.348***	0.71
Strategy-Future-Dev-Plan-ICT-Apps	0.75	10.711***	0.56
Strategy-Future-Dev-Plan-ICT-Infrastructure	0.72	12.865***	0.53
Strategy-Future-Dev-Plan-HR	0.78	13.813***	0.60
Strategy-Future-Dev-Plan-Media-Channels	0.59	13.947***	0.35

Note: f.p.: fixed parameter for estimation; ***$p < 0.001$

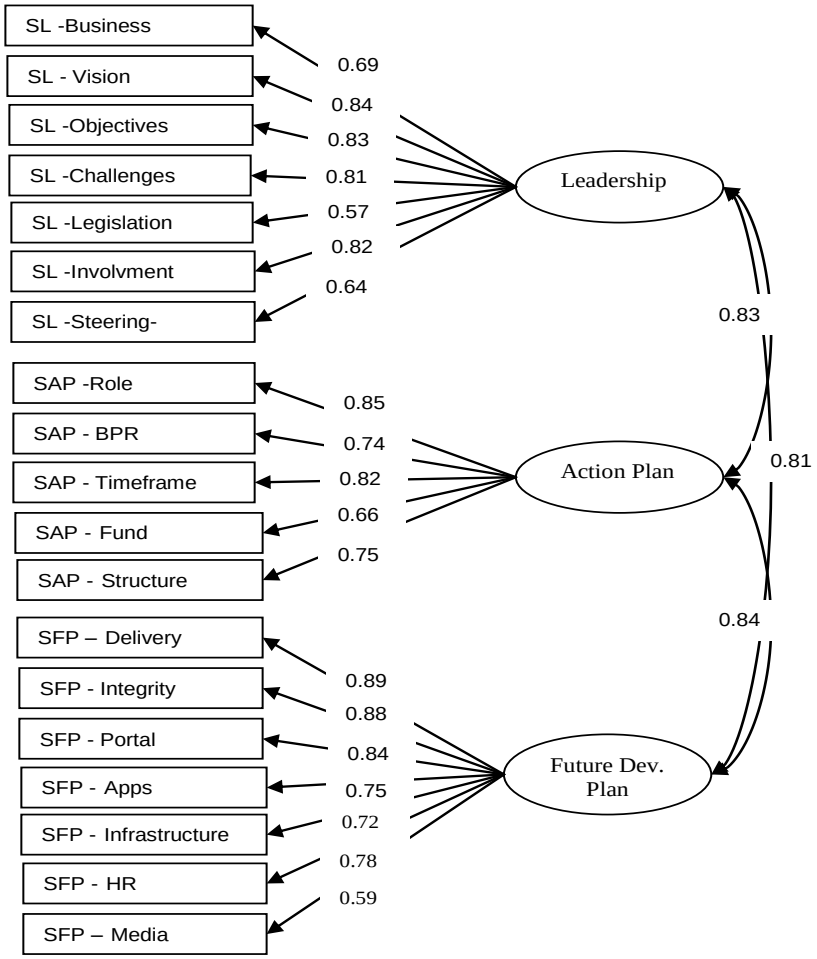


Figure 5-9: CFA model of the strategy construct

The CFA results of the user access construct are presented in Table 5-19. The model (Figure 5-10) appears to have a good level of fit: χ^2=6.650; *df*=5; χ^2/df=1.330; GFI=.986; IFI=.994; TLI=.981; CFI=.994; and RMSEA=.046 (Hair et al., 2010). All the variable loadings, ranging from 0.56 to 0.83, were greater than the threshold level of 0.50 and were all significant at $p<0.01$ level, demonstrating convergent validity. With the exception of six variables, all of the R^2 values were either greater than or close to 0.50, thus supporting an acceptable reliability of the variables. The variables with low R^2 values were retained since they had substantial and high significant loadings. The correlation coefficient between the two factors was 0.58, less than 0.85, thus confirming the discriminant validity of the construct. Finally, since the fit indices of the respecified model proved to be good, unidimensionality of this construct was upheld.

Table 5-19: CFA results of the user access construct–final factors

Variables Description	Factor Loadings	*t*-value	R^2
User access: Stakeholders			
Access-G2C-E-Services	0.80	f.p.	0.65
Access-G2G-E-Services	0.83	9.215***	0.69
Access-G2E-E-Services	0.56	9.264***	0.31
User access: Delivery channels			
Access-Delivery-Channels-ATMs	0.60	f.p.	0.36
Access-Delivery-Channels-WAP	0.62	7.417***	0.38
Access-Delivery-Channels-Call-Centre	0.82	7.024***	0.66

Note: f.p.: fixed parameter for estimation; ***p<0.001

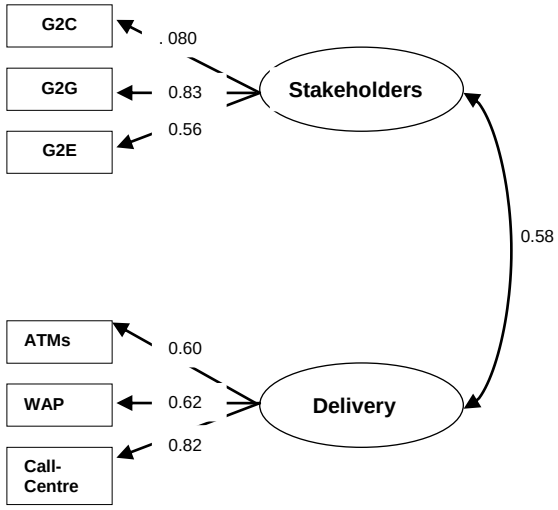


Figure 5-10: CFA model of the user access construct

The final CFA results of the Yesser construct are presented in Table 5-20. The final fit indices of the respecified model (Figure 5-11) demonstrate a good level of fit: χ^2=10.711; *df*=6; χ^2/df=1.785; GFI=.984; IFI=.995; TLI=.977; CFI=.995; and RMSEA=.071(Hair et al., 2010). All the variable loadings, ranging from 0.59 to 0.93, were greater than or close to the threshold level of 0.50 and were all significant at p<0.001 level, demonstrating convergent validity. With the exception of two variables, all of the R^2 values were either greater than or close to 0.50, thus supporting an acceptable reliability of the variables. The variables with low R^2 values were retained since they had substantial and high significant loadings.

The correlation coefficient between the pair of factors was 0.80, less than 0.85, thus confirming the discriminant validity of the construct. Finally, since the fit indices of

the respecified model proved to be good, unidimensionality of this construct was established.

Table 5-20: CFA results of the Yesser construct–final factors

Variables Description	Factor Loadings	*t*-value	R^2
Yesser: Portal Availability			
Yesser-Portal-SSO	0.59	f.p.	0.35
Yesser-Portal-E-Mail-CD-DVD	0.67	8.423***	0.49
Yesser-Portal-Roles-Responsibilities	0.61	8.135***	0.51
Yesser-Portal-Exch-Direct-Connectivity	0.73	9.816***	0.53
Yesser-Portal-E-Services	0.86	5.747***	0.74
Yesser: GSN			
Yesser-GSN-Availability	0.91	f.p.	0.82
Yesser-GSN-Integrity	0.63	12.971***	0.40
Yesser: GSB			
Yesser-GSB-Availability	0.93	f.p.	0.87
Yesser-GSB-E-Services	0.87	8.575***	0.75
Yesser-GSB-integrity	0.57	13.947***	0.32

Note: f.p.: fixed parameter for estimation; ***p<0.001

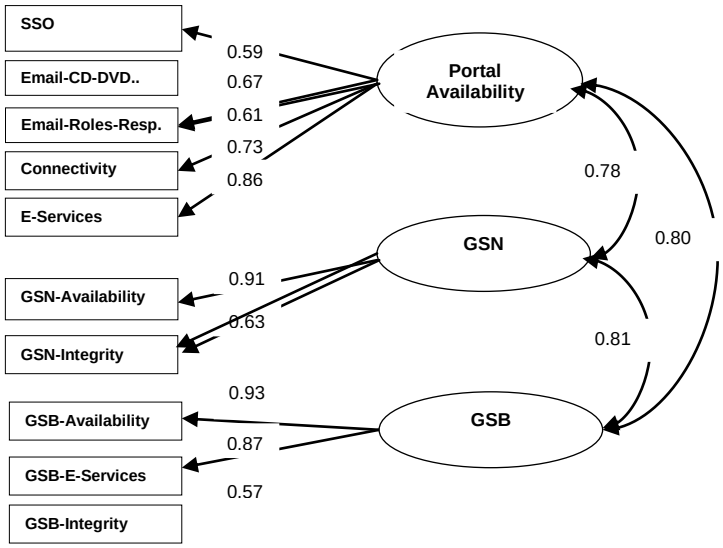


Figure 5-11: CFA model of the Yesser construct

The final CFA results of the portal construct are presented in Table 5-21. The final fit indices of the respecified model (Figure 5-12) demonstrate a good level of fit: χ^2=104.118; *df*=56; χ^2/df=1.85; GFI=.919; IFI=.975; TLI=.958; CFI=.974; and RMSEA=.074 (Hair et al., 2010). All the variable loadings, ranging from 0.57 to 0.92, were greater than or close to the threshold level of 0.50 and were all significant

at $p<0.001$, demonstrating convergent validity. With the exception of two variables, all of the R^2 values were either greater than or close to 0.50, thus supporting an acceptable reliability of the variables. The variables with low R^2 values were retained since they had substantial and high significant loadings.

The correlation coefficients between each pair of factors, ranging from 0.80 to 0.84, were all less than 0.85, thus confirming the discriminant validity of the construct. Finally, since the fit indices of the respecified model proved to be good, unidimensionality of this construct was established.

Table 5-21: CFA results of the portal construct–final factors

Variables Description	Factor Loadings	*t*-value	R^2
Portal: Availability			
Website-Quality-SSO	0. 83	f.p.	0.70
Website-Quality-Availability	0. 84	12.899***	0.71
Website-Quality-Usability	0.83	11.967***	0.70
Website-Quality-Layout	0. 81	12.059***	0.66
Website-Quality-Navigation	0.80	12.672***	0.64
Website-Quality-Consistency	0.84	12.763***	0.71
Website-Quality-Information	0.79	12.668***	0.62
Portal: SOA			
Website-SOA-Single-Transaction	0.73	f.p.	0.53
Website-SOA-Multiple-Transaction	0.57	9.772***	0.32
Website-SOA-Multible-Database	0.71	7.417***	0.50
Website-SOA-Compatibility	0.84	10.286***	0.70
Portal: Layered structures			
Website-Quality-Layered-Structures-Operating-Systems	0.92	f.p.	0.84
Website-Quality-Layered-Structures-Software	0.80	11.813***	0.65
Website-Quality-Layered-Structures-Connectivity	0.77	14.456***	0.59

Note: f.p.: fixed parameter for estimation; ***$p < 0.001$

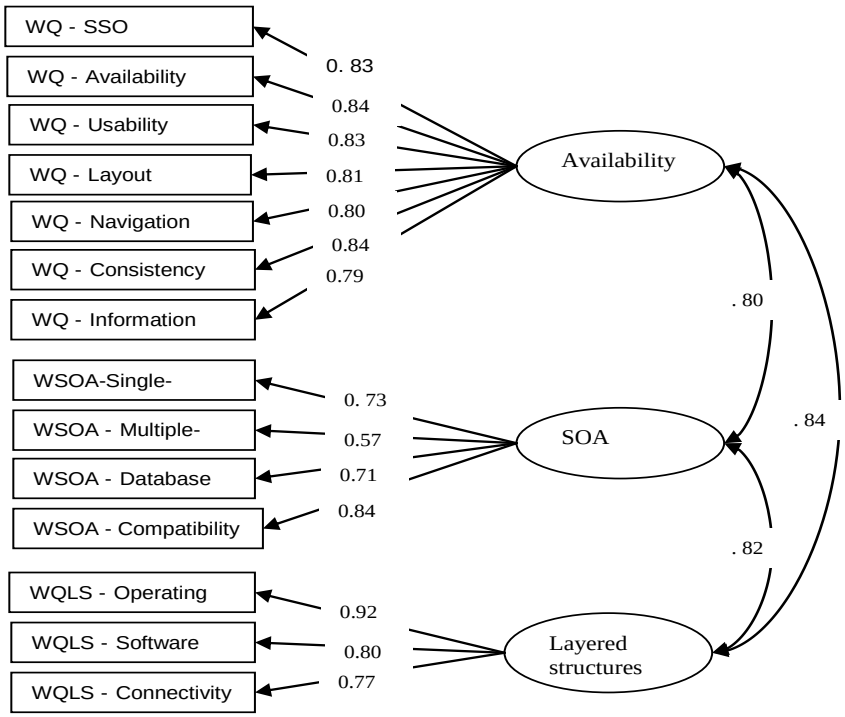


Figure 5-12: CFA model of the portal architecture construct

The final CFA results of the business processes construct are presented in Table 5-22. The initial fit indices were unsatisfactory since there was significant cross loading or low loading coupled with low R^2 for one variable (support–processes–motives). It was therefore removed from the model. The final fit indices of the respecified model (Figure 5-13) demonstrate a good level of fit: χ^2=240.113; *df*=175; χ^2/df=1.37; GFI=0.90; IFI=0.979; TLI=.969; CFI=.979; and RMSEA=.049 (Hair et al., 2010). All the variable loadings, ranging from 0.55 to 0.90, were greater than or close to the threshold level of 0.50 and were all significant at $p<0.001$, demonstrating convergent validity. With the exception of two variables, all of the R^2 values were either greater than or close to 0.50, thus supporting an acceptable reliability of the variables. The variables with low R^2 values were retained since they had substantial and high significant loadings.

The correlation coefficients between each pair of factors, ranging from 0.77 to 0.82, were all less than 0.85, thus confirming the discriminant validity of the construct. Finally, since the fit indices of the respecified model proved to be good, unidimensionality of this construct was established.

Table 5-22: CFA results of the processes construct–final factors

Variables Description	Factor Loadings	*t*-value	R^2
Support Processes			
Support-Processes-Change	0. 73	f.p.	0.53
Support-Processes-Workflow	0. 78	7.331***	0.61
Support-Processes-Documents	0.82	12.480***	0.67
Support-Processes-Collaborative	0. 84	11.990***	0.71
Support-Processes-Integration	0.57	11.084***	0.33
Support-Processes-Streamline	0.55	10.095***	0.30
Processes Automations			
Processes-Auto-Core-Business	0.68	f.p.	0.47
Processes-Auto-ERP	0.74	11.207***	0.55
Processes-Auto-EAI	0.83	11.590***	0.68
Processes-Auto-CRM	0.79	12.345***	0.63
Processes-Auto-Web-based	0.77	10.525***	0.60
Processes-Auto-support-applications	0.63	9.434***	0.39
Data & Information flow			
Processes-Data-Info-Flow-databases	0.88	f.p.	0.77
Processes-Data-Info-Flow-Accuracy	0.87	9.190***	0.75
Processes-Data-Info-Flow-Software	0.90	9.751***	0.81
Processes-Data-Info-Flow-Timeliness	0.82	7.766***	0.67
Processes-Data-Info-Flow-Convenience	0.88	10.019***	0.77
Processes-Data-Info-Flow-Data-entry	0.79	11.725***	0.62
Processes-Data-Info-Flow-Software -2	0.70	13.818***	0.50
Processes-Data-Info-Flow-Quality	0.58	12.415***	0.34
Processes-Data-Info-Flow-SMS	0.69	14.468***	0.48
Processes-Data-Info-Flow-Website	0.66	13.461***	0.43
Processes-Data-Info-Flow-Email	0.71	13.877***	0.50

Note: f.p.: fixed parameter for estimation; ***$p < 0.001$

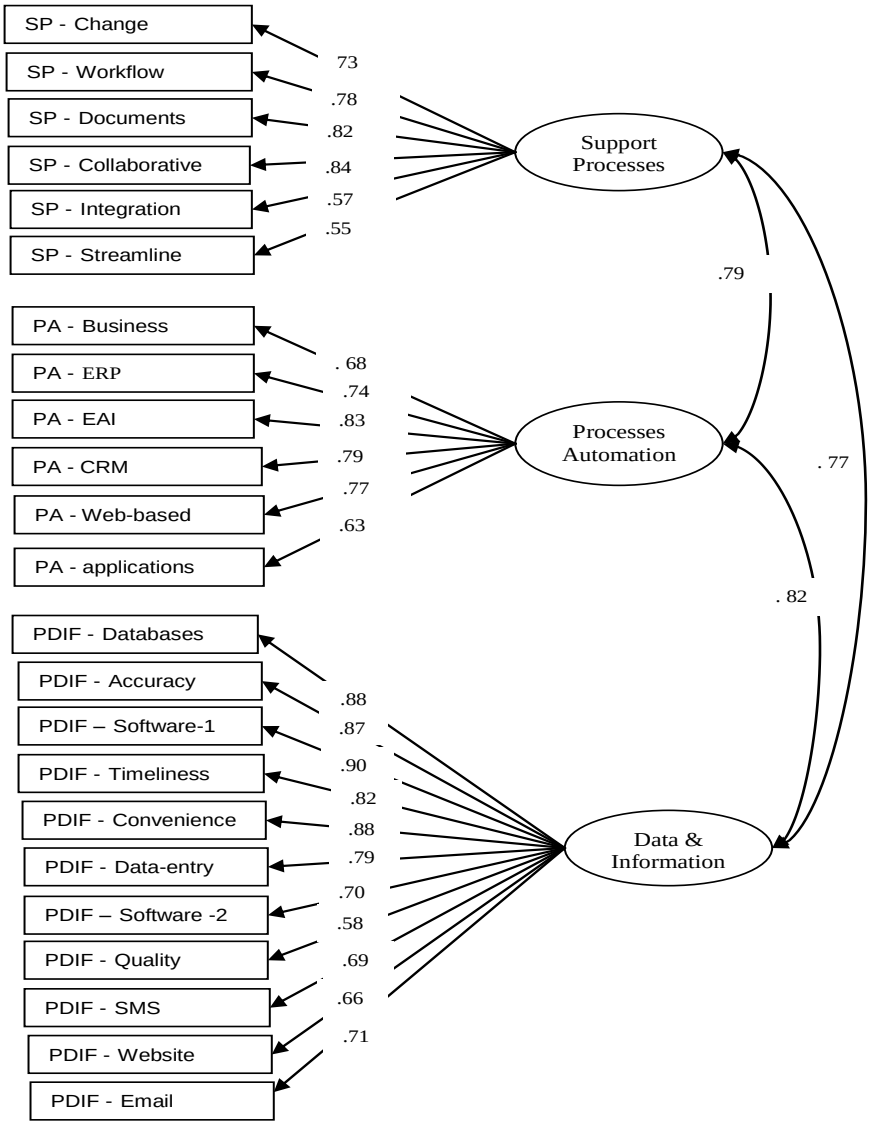


Figure 5-13: CFA model of the business processes construct

The final CFA results of the ICT infrastructure construct are presented in Table 5-23. The initial fit indices were unsatisfactory since there was significant cross loading or low loading coupled with low R^2 for five variables, which were therefore removed from the model. The final fit indices of the respecified model (Figure 5-14) demonstrate a good level of fit: χ^2=259.277; *df*=155; χ^2/df=1.673; GFI=.90; IFI=.958; TLI=.942; CFI=.957; and RMSEA=.066 (Hair et al., 2010). All the variable loadings, ranging from 0.61 to 0.89, were greater than or close to the threshold level of 0.50 and were all significant at $p<0.001$, demonstrating convergent validity. With the exception of two variables, all of the R^2 values were either greater than or close to 0.50, thus supporting an acceptable reliability of the variables. The

variables with low R^2 values were retained since they had substantial and high significant loadings.

The correlation coefficients between each pair of factors, ranging from 0.48 to 0.84, were all less than 0.85, thus confirming the discriminant validity of the construct. Finally, since the fit indices of the respecified model proved to be good, unidimensionality of this construct was established.

Table 5-23: CFA results of the ICT infrastructure construct–final factors

Variables Description	Factor Loadings	*t*-value	R^2
ICT Infrastructure: Hardware & Software			
Infrs-H/W-Desktop	0. 61	f.p.	0.37
Infrs-H/W-Compatibility-Dep.	0. 79	11.704***	0.62
Infrs-H/W-Compatibility-Agencies.	0.82	12.219***	0.67
Infrs-H/W-Compatibility-Standards	0. 77	11.323***	0.59
Infrs-S/W-Ease-of-use.	0.85	13.326***	0.73
Infrs-S/W-Accessibility	0.87	13.644***	0.70
Infrs-S/W-Usefulness.	0.85	13.146***	0.72
Infrs-S/W-Operating-Systems	0.76	11.073***	0.58
Infrs-S/W-standards	0.80	12.097***	0.65
Infrs-S/W-Quality	0.89	14.015***	0.79
ICT Infrastructure: Connectivity			
Infrs-Connectivity-LAN	0.77	f.p.	0.59
Infrs-Connectivity-WAN	0.70	8.167***	0.49
Infrs-Connectivity-speed	0.78	11.145***	0.61
Infrs-Connectivity-Rural	0.73	10.178***	0.68
Infrs-Connectivity-VoIP	0.62	10.517***	0.39
ICT Infrastructure: Security			
Infrs-Security-Policies	0.89	f.p.	0.80
Infrs-Security-Awareness	0.67	9.770***	0.45
Infrs-Security-Tools	0.71	9.105***	0.50
ICT Infrastructure: Operations			
Infrs-Operations-day-to-day-work-plan	0.76	f.p.	0.57
Infrs-Operations-User-Support	0.74	11.244***	0.55
Infrs-Operations-Redundancy	0.88	13.420***	0.77
Infrs-Operations-Updates-Upgrades	0.77	10.655***	0.60

Note: f.p.: fixed parameter for estimation; ***$p < 0.001$

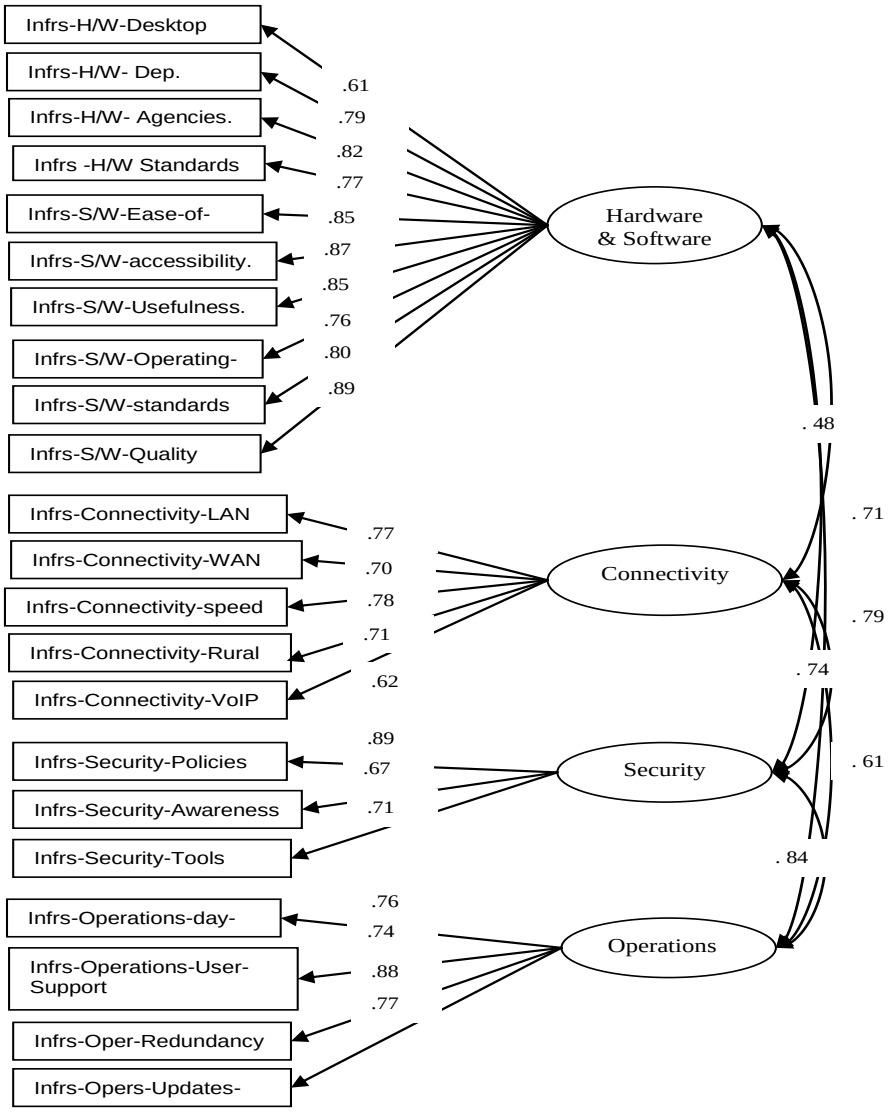


Figure 5-14: CFA model of the ICT infrastructure construct

The final CFA results of the human resources construct are presented in Table 5-24. The initial fit indices were unsatisfactory since there was significant cross loading or low loading coupled with low R^2 for two variables (skills-1, training-1). They were therefore removed from the model. The final fit indices of the respecified model (Figure 5-15) demonstrate a good level of fit: χ^2=24.382; *df*=15; χ^2/df=1.625; GFI=.969; IFI=.992; TLI=.975; CFI=.992; and RMSEA=.064 (Hair et al., 2010). All the variable loadings, ranging from 0.56 to 0.94, were greater than or close to the threshold level of 0.50 and were all significant at the p<0.001 level, demonstrating convergent validity. With the exception of two variables, all of the R^2 values were

either greater than or close to 0.50, thus supporting an acceptable reliability of the variables. The variables with low R^2 values were retained since they had substantial and high significant loadings.

The correlation coefficients between each pair of factors, ranging from 0.79 to 0.84, were all less than 0.85, thus confirming the discriminant validity of the construct. Finally, since the fit indices of the respecified model proved to be good, unidimensionality of this construct was established.

Table 5-24: CFA results of the human resources construct–final factors

Variables Description	Factor Loadings	*t*-value	R^2
Human Resources: Awareness			
HR-Awareness-Management	0. 56	f.p.	0.32
HR-Awareness-impact-on employee	0. 94	14.729***	0.88
HR-Awareness-adopt- to-change	0.83	12.210***	0.69
Human Resources: Skills			
HR-Skills-2	0.86	f.p.	0.74
HR-Skills-3	0.94	14.430***	0.88
Human Resources: Training			
HR-Training- 2	0.86	f.p.	0.74
HR-Training- 3	0.70	9.555***	0.49
HR-Training- 4	0.83	12.151***	0.68
HR-Training- 5	0.73	10.170***	0.54
HR-Training- 6	0.74	10.383***	0.55

Note: f.p.: fixed parameter for estimation; ***$p < 0.001$

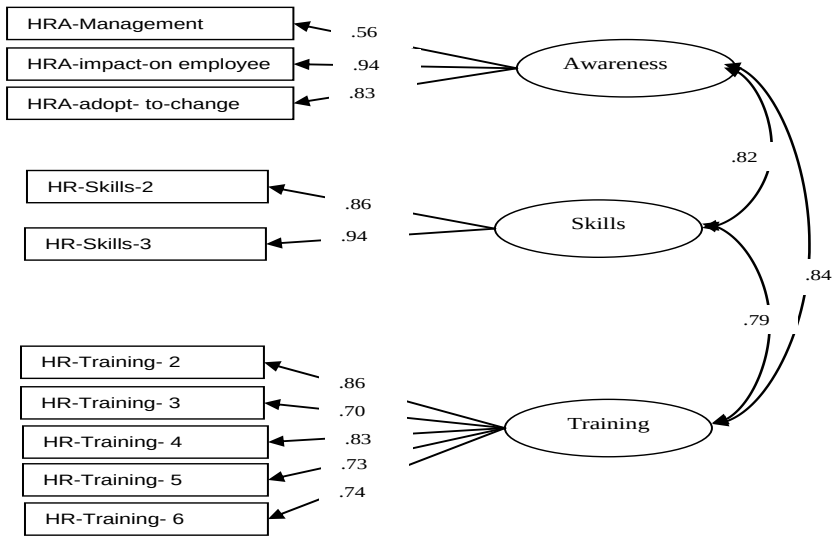


Figure 5-15: CFA model of the human resources construct

5.9.3 Summary of CFA results

The CFA results confirmed the constructs' structure derived from the EFA of the strategy, user access, Yesser, portal, processes, ICT infrastructure and human resources constructs. As presented in Table 5-25, the CFA slightly refined the structures of some variables of the seven constructs by removing them to improve the model fit.

The final values of Cronbach's alpha were all very high, ranging from 0.744 to 0.965, thus indicating the reliability of these constructs. Within each construct, all variables significantly and substantially loaded onto their respective factors with acceptable levels of reliability, thus indicating construct validity. All the fit indices proved to be satisfactory, which confirmed the unidimensionality of the model constructs.

Table 5-25: Summary of CFA results

Construct/Factor	Number of Variables (EFA)	Number of Variables (CFA)	Final α	Model Fit indices							
				χ^2	df	χ^2/df	GFI	IFI	TLI	CFI	RMSEA
Strategy			0.959	179.256	117	1.53	0.902	.975	0.963	.975	0.059
Leadership	7	7									
Action Plan	5	5									
Future Dev. Plan	7	7									
Users Access			0.744	6.650	5	1.330	0.986	.994	0.981	.994	0.046
Stakeholders	3	3									
Delivery channels	3	3									
Yesser			0.760	10.711	6	1.785	0.984	.995	0.977	.995	0.071
Portal Availability	5	5									
GSN	2	2									
GSB	3	3									
Portal			0.940	104.118	56	1.85	0.991	.975	0.958	.974	0.074
Availability	7	7									
SOA	4	4									
Layered structures	3	3									
Business Processes			0.942	240.11	175	1.37	0.905	.981	0.969	.979	0.049
Support Processes	7	6									
Processes Automations	6	6									
Data & Information flow	11	11									
ICT Infrastructure			0.965	256.277	155	1.673	0.903	.958	0.942	.957	0.066
Hardware & Software	**13**	**10**									
Connectivity	**7**	**5**									
Security	3	3									
Operations	4	4									
Human Resources			0.921	24.384	15	1.625	0.969	.992	0.975	.992	0.064
Awareness	3	3									
Skills	**3**	**2**									
Training	**6**	**5**									

5.10 **Relationship Identification**

5.10.1 Structural equation modelling overview

The SEM analysis in this study determined and assessed the measurement model to create the validity and unidimensionality. Next, the structural model assessed the relationships between the dimensions (Gerbing and Anderson, 1988). The structural and measurement models required an assessment of the model fit indices and parameter estimates, which were derived from similar processes and criteria conducted in the CFA performed earlier in this chapter.

5.10.2 Measurement model assessment

5.10.2.1 Measurement model specification and assessment criteria

The constructs of the model consist of three layers: 1) indicators, indicating the measured variables; 2) first-order factors, indicating the factors derived from the factor analysis; and 3) second-order factors, indicating the primary constructs. This model is categorised as a whole disaggregation as every variable is a single item, and where all single measured variables were integrated in the analysis. This sort of measurement potentially affects the model's parsimony, causing erroneous parameter estimates or the calculation of parameters incapable of converging (Edwards and Bagozzi, 1998).

In order to cover the above issues, item parcelling techniques were used for two reasons: 1) to reduce complexity of the model; and 2) to combine all the constructs into a two-layer model. This aggregation method was used by taking the means of a number of variables that measure the same construct (Hair et al., 2010). The assumption of unidimensionality has to be achieved before performing the item parcelling technique (Kline, 2011). The constructs of unidimensionality were created earlier in Chapter 3. Thus, item parcelling techniques were applied for all variables in strategy, user access, Yesser, portal architecture, processes, ICT infrastructure and human resources to represent their relevant factor.

The preliminary measurement model was developed by combining the individual CFA models of all the constructs (see Section 5.9) into a single preliminary measurement model. This preliminary measurement model was classified into a two-

layer model for all constructs. The item-parcelled factors were considered as pointers, while the constructs were considered as first-order factors (see Figure 5-16). The partial disaggregation model was chosen as it was more economical. Hence, it was employed as the measurement model in the CFA analysis. The assessment of measurement model, model fit, convergent and discriminant validity, and unidimensionality were evaluated by the CFA technique described in Section 5.9.

In addition, the reliability of the model was evaluated via a more advanced measure of 'composite reliability' and 'average variance extracted' instead of the traditional Cronbach's alpha. Composite reliability was used to assess the degree to which a position of two or more variables contribute or share in their measurement of a construct (Koufteros, 1999; Hair et al., 2010). Although greater than 0.60 of values for composite reliability are recommended, the values for average variance extracted at greater than 0.50 are considered satisfactory (Koufteros, 1999; Bagozzi and Youjae, 1988).

5.10.2.2 Measurement model results

As presented in Figure 5-16 and Table 5-26, the model exhibited a good level of fit (χ^2=318.163; *df*=149; χ^2/df=2.135; GFI=.90; IFI=.956; TLI=.923; CFI=.954; and RMSEA=.07). All the factors had significant loadings greater than 0.50 ($p<0.001$) on their respective constructs. All the constructs were shown to have a composite reliability greater than the threshold level of 0.60 and their reliability was also greater than the threshold level of 0.50 (Bagozzi and Youjae, 1988). All of the correlation coefficients between each pair of the constructs were less than 0.85, suggesting adequate discriminant validity. These results indicated that the measurement model possessed substantial convergent validity and unidimensionality.

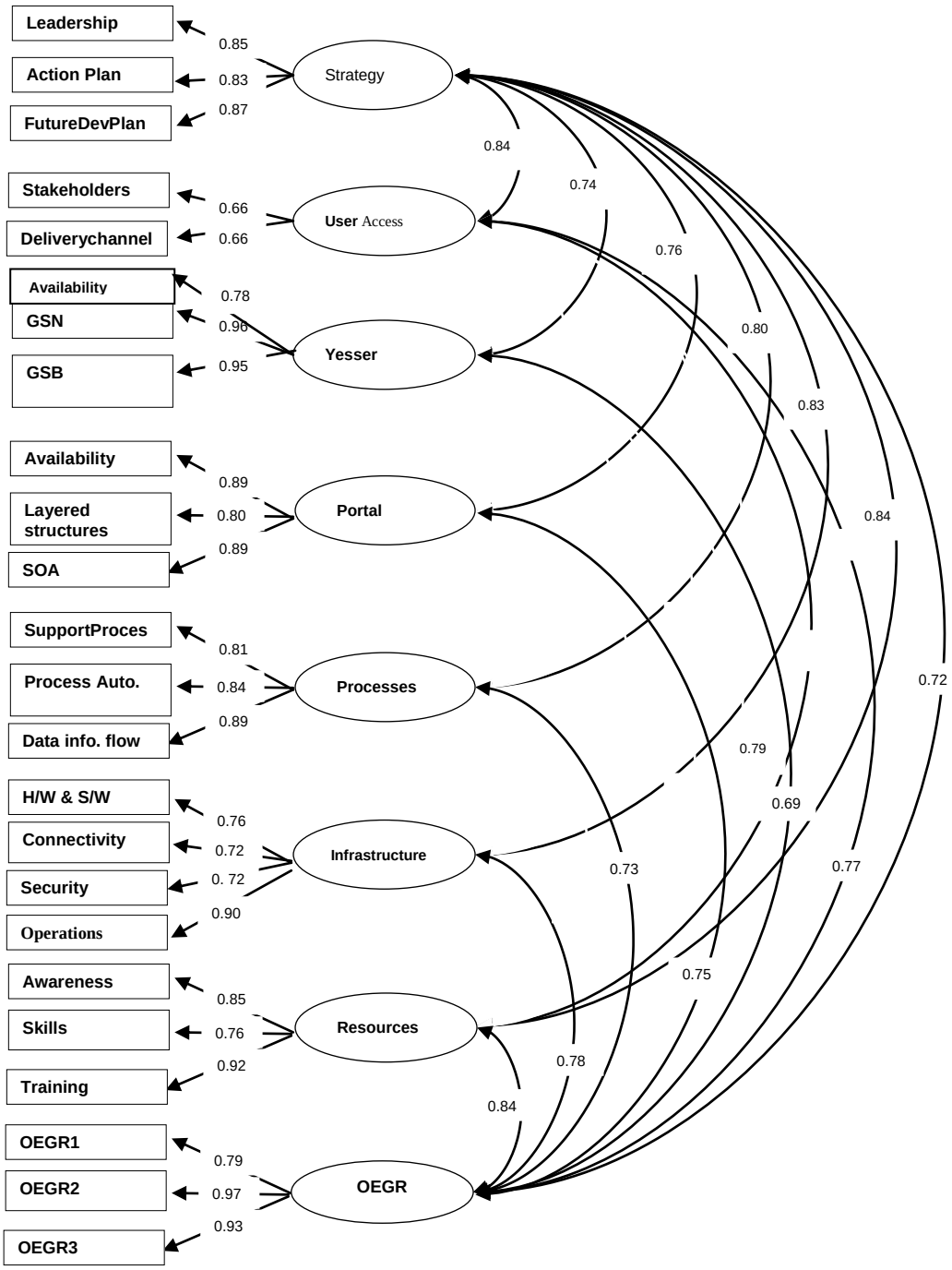


Figure 5-16: Final measurement model

Table 5-26: Measurement model results

Construct/Factors	Loading	t-value	R^2	Composite Reliability	Average Variance Extracted	Correlation between Dimensions	
Strategy				0.898	0.83	Strategy -- OEGR	0.72
						Strategy – User Access	0.84
Future Dev Plan	0.87	f.p.	.75			Strategy -- Yesser	0.74
Action Plan	0.83	2.21***	.60			Strategy -- Portal	0.76
Leadership	0.85	2.92***	.73			Strategy -- Processes	0.80
						Strategy -- Infrastructure	0.83
						Strategy -- Human R.	0.84
User Access				0. 571	0.71		
Stakeholders	0.66	f.p.	.44			User Access – OEGR	0.77
Delivery channels	0.66	8.35***	.44				
Yesser				0.824	0.85		
Availability	0.78	f.p.	.61			Yesser -- OEGR	0.69
GSN	0.96	5.29***	.92				
GSB	0.95	4.21***	.89				
Portal Architecture				0.870	0.80		
Layered structures	0.80	f.p.	.65				
Availability	0.89	3.90***	.79			Portal -- OEGR	0.75
SOA	0.89	3.83***	.79				
Processes				0.845	0.76		
Data information flow	0.89	f.p.	.78				
Support processes	0.81	1.96***	.66			Processes – OEGR	0.73
Process Automations	0.84	2.73***	.71				
ICT Infrastructure				0.864	0.72		
Security	0.72	f.p.	.52				
Connectivity	0.72	0.01***	.51			ICT Infrastructure -- OEGR	0.78
Hardware Software	0.76	1.17***	.58				
Operations	0.90	4.02***	.82				
Human Resources				0.913	0.85		
Skills	0.76	f.p.	.57				
Awareness	0.85	3.08***	.73			Human Resource – OEGR	0.84
Training	0. 92	4.66***	.85				
E-Government Readiness				0.922	0.87		
OEGR-1	0.79	f.p.	.63				
OEGR-2	0.97	6.33***	.94				
OEGR-3	0.93	5.16***	.86				

Notes: f.p.: fixed parameter; ***$p < 0.001$;

$\chi^2 = 318.163$; $df = 149$; $\chi^2/df = 2.135$; GFI = .90; IFI = .956; TLI = .923; CFI = .954; and RMSEA = .07

5.10.3 Structural model assessment

5.10.3.1 Structural model specification and assessment criteria

The structural model was précised by replacing all double-headed arrows, which indicate the correlations among the constructs, with single-headed arrows. These causal arrows indicate the relationships of hypothesis among the constructs. Figure 5-17 illustrates the complete structural model, integrating the factor structures and the relationships between hypotheses. In general, the model identified in this study assessed the effect of the seven dimensions' strategy (H1), user access (H2), Yesser (H3), portal architecture (H4), processes (H5), ICT infrastructure (H6) and human resources (H7) (the independent variables) on OEGR (the dependent variable). Also, it evaluated the impact of the strategy dimension (the dependent variable) on the six other dimensions (the independent variables): H8a to H8f (described in Section 4.2.8). The structural model assessment processes involved an assessment of model fit indices and the standardised path coefficients to present a foundation leading to accepting or rejecting the hypothesis. The standard and criteria for the model fit indices implemented in this analysis were similar to those used in the assessment of the measurement model. The relationships of the hypothesis to be supported, that relationships in the path model have a 'meaningful' standardised coefficient, should be greater than or close to 0.30 (Byrne, 2001; Chin, 1998).

5.10.3.2 Structural model results

As presented in Table 5-27 and Figure 5-17, the model exhibited a good level of fit (χ^2=6.003; *df*=3; χ^2/df=2; GFI=0.991; IFI=0.998; TLI=0.976; CFI=0.997; and RMSEA=0.07).Twelve of the thirteen path coefficients were statistically significant and were considered meaningful (ranging from 0.29 to 0.78).

The OEGR construct was found to be a positive influence by the Strategy constructs (0.37, $p<.05$), thus supporting H1. The user access construct had no positive influence on the OEGR construct (-0.08, $p<.05$), thus not supporting H2. The Yesser construct had a positive influence on the OEGR construct (0.29, $p<.05$), thus supporting H3. The OEGR constructs were found to be a positive influence by the portal construct (0.31, $p<.05$), thus supporting H4. The processes construct had a positive influence on the OEGR construct (0.28, $p<.05$), thus supporting H5. The OEGR constructs were found to be influenced by the infrastructure construct (0.29,

p<.*05*), thus supporting H6. The OEGR constructs were found to be highly and positively influenced by the human resources construct (0.34, *p*<.*001*), thus supporting H7.

The strategy construct had a high positive influence on the user access construct (0.69, *p*<0.001), thus supporting H8a. The strategy construct had a high positive influence on the e-Government programme construct (0.74, *p*<0.001), thus supporting H8b. The strategy construct had a high positive influence on the portal construct (0.78, *p*<0.001), thus supporting H8c.The strategy construct had a high positive influence on the processes construct (0.75, *p*<0.001), thus supporting H8d. The strategy construct had a high positive influence on the ICT infrastructure construct (0.72, *p*<0.001), thus supporting H8e. The strategy construct had a high positive influence on the human resources construct (0.69, *p*<0.001), thus supporting H8f.

These results suggest that all twelve paths within the developed conceptual model were supported by the data, except one: user access to OEGR.

Table 5-27: Initial structural model results

Path (Hypothesis)			Standardized path coefficient	*t*-value	Hypothesis testing result
Strategy	→	OEGR	0.37	2.53*	Supported
User Access	→	OEGR	-0.08	-1.08n.s.	Not Supported
Yesser	→	OEGR	0.29	2.14*	Supported
Portal	→	OEGR	0.31	2.21*	Supported
Processes	→	OEGR	0.28	2.16*	Supported
ICT Infrastructure	→	OEGR	0.29	2.21*	Supported
Human Resources	→	OEGR	0.34	4.36***	Supported
Strategy	→	User Access	0.69	11.9***	Supported
Strategy	→	Yesser	0.74	13.87***	Supported
Strategy	→	Portal	0.78	15.53***	Supported
Strategy	→	Processes	0.75	14.26***	Supported
Strategy	→	ICT Infrastructure	0.72	12.97***	Supported
Strategy	→	Human Resources	0.69	12.11***	Supported

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; $^{n.s.}$ Not significant at $p < 0.05$ level.

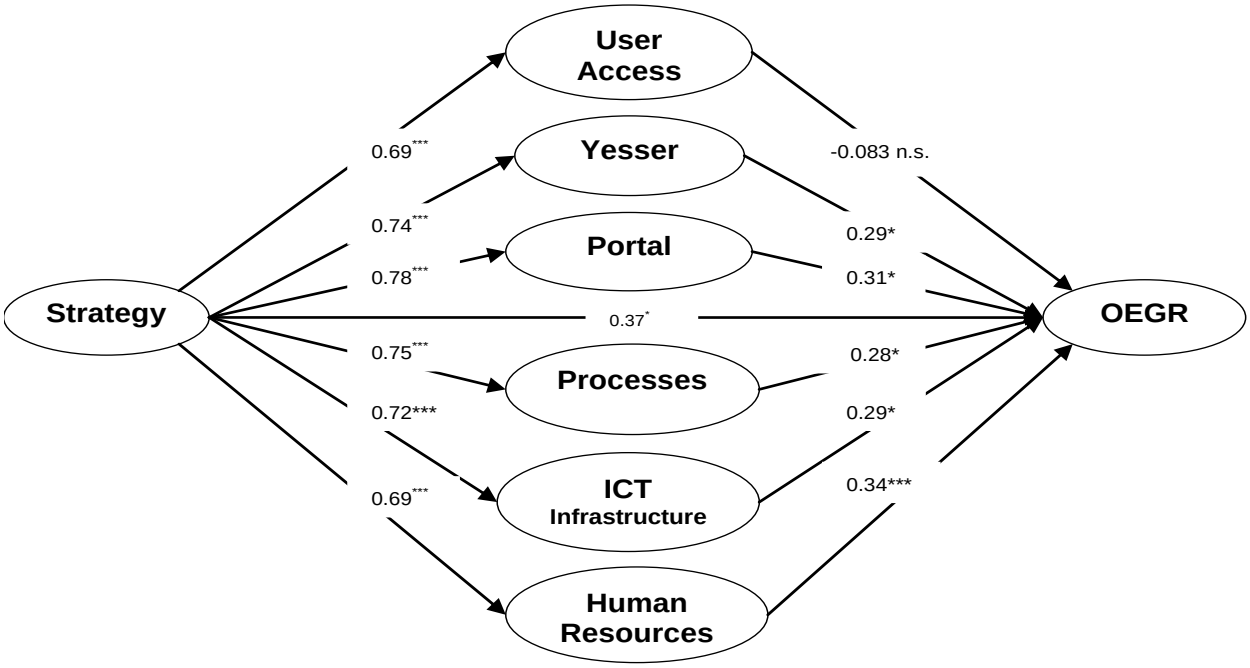


Figure 5-17: Structural model with standardised path coefficients

The present evidence suggests that there is a strong correlation of all identified factors with the concept of OEGR (except one: user access to OEGR), and that the proper operationalization and measurement thereof may give a clear, comprehensive image of what the OEGR level is in each particular public sector organization. These six factors, in their turn, were found to be strongly correlated with the factor of strategy determining their impact on OEGR. These findings support the initially estimated relationship between all six factors and OEGR assessment, and prove the validity of this model with proper regard to the pervasive mediating impact of a strategic direction on the efforts made towards e-Government services' establishment.

5.11 **Summary**

This chapter prepared the data in order to present a perception of the aspects of the data collected from the questionnaire survey of Saudi Arabian organisations. Investigating the profiles of the 438 responses confirmed that their provided perspectives gave reliable and unbiased information based on their qualifications, their current position, and the characteristics of their organisations. The data were screened and found to have a satisfactory normal distribution, with no missing data

or outliers. An assessment for standard deviation and standard error of the mean revealed that a mean value can be considered as a representative score for each variable, and that the sample employed in the study adequately represented the demography. As a result it was considered appropriate as an input for the consequent measurement scale analysis as presented.

This chapter also presented the results of the measurement scale development and relationship identification. First, it provided the results of the measurement scale analysis with regards to the evaluation of scale reliability, EFA, and CFA of the data of the questionnaire survey. The assessment of scale reliability revealed that the measurement scales, which were utilised to find the meaning of the model constructs, were reliable, as confirmed by the high Cronbach's alpha values for each construct. Moreover, the item-total correlations of all the variables were significant, confirming that each variable was an adequate measure for its underlying construct. Subsequently, EFA was performed for each construct to find the proper number of latent factors (factor structures). Furthermore, throughout Harman's one-factor test, the EFA was applied to all variables to evaluate the difficulty of common-method variance. The results of this test revealed that common-method variance was not a main consideration in regard to scale reliability. The factor structures resulting from EFA were then tested by the stricter CFA method to prove the validity. The results of the CFA confirmed the final factor structures of adequate reliability, validity and unidimensionality for each construct. The results created a foundation for producing the combined factors to ease the following model assessment, and were employed in the additional multivariate analyses through the next step of determining the relationships between these constructs.

In addition, this chapter presented the analysis processes and assessment results for the conceptual model. The chapter detailed an overview of the SEM analytical technique used to assess and filter the theoretically-developed model. The analysis consisted of an assessment of the two major SEM elements—measurement model and structural model. The assessment results revealed that the particular measurement model confirmed satisfactory levels of fit, convergent validity, discriminant validity and unidimensionality.

Next, the analysis progressed to an assessment of the structural model, the second key element of the SEM. This phase included: 1) an assessment of the hypothesised relationships between the model constructs; and 2) a hierarchical analysis to propose the final model. The results from the structural model assessment answered the research question. In particular, the final structural model revealed that the strategy construct influenced all the constructs positively, and that all the constructs influenced the OEGR positively except the user access construct which was not related to the OEGR. The final chapters will now discuss the findings of the qualitative and the quantitative research.

Chapter 6: Discussion

6.1 Overview

This chapter discusses the findings obtained from the empirical research based on the qualitative and quantitative study of public sector organisations in Saudi Arabia. The study incorporated both qualitative and quantitative research. A final version of the model for assessing e-Government readiness of public organisations in Saudi Arabia is also presented. Qualitative analysis of the data was undertaken as phase one of research to confirm the propriety of selected factors affecting the OEGR of public sector organizations, and it confirmed all factors' significance. As a result of qualitative analysis, thirteen hypotheses were developed for the second phase of research –statistical testing of the model. Hence, the quantitative data were analysed in order to represent the OEGR status of Saudi Arabia. The quantitative analysis confirmed the impact of strategy on all other six aspects of OEGR, but revealed that there is no direct link between user access and OEGR. This chapter also provides a discussion of each of the constructs in the study findings by triangulating qualitative and quantitative results. The aim was to compare both types of data to show the level to which the empirical research reproduced the model that resulted from the literature review.

This chapter presents a critical analysis of the results gained from adding the quantitative data of the study, and compares them with the model proposed in Chapter 2. This analysis leads to the development of a final version of a model for assessing the OEGR of government organisations in Saudi Arabia.

Qualitative results have provided an in-depth understanding of what the current situation with OEGR in public sector organizations is, and what factors may be meaningful for inclusion into the OEGR assessment model. Additionally, quantitative data acquired from diverse sources was triangulated with qualitative data to further understand the views of top and middle management, and ICT and e-Government specialists who participated in the survey questionnaire. This chapter presents the discussion of the study to compare the qualitative data achieved from interviews with the quantitative data gained from the survey questionnaire. After the exploratory and confirmatory factor analyses, the study used SEM analysis to test the

hypothesised relationships. Section 6.2 discusses the impact of the strategy on other dimensions, while Section 6.3 is dedicated to the nature of influence exerted by each of the factors elicited for the OEGR assessment model. Section 6.4 presents the corrected and updated integrated model for OEGR assessment in Saudi Arabian public sector organizations based on the findings from qualitative and quantitative research stages of this dissertation. Finally, Section 6.5 summarizes the chapter.

6.2 Impact of Strategy on All OEGR-Related Factors

H1: ***Assessing the effect of strategy on OEGR should consider several factors such as leadership, action plan and development plan***

Since the first hypothesis was focused on the role of strategy in the OEGR formation and assessment, the discussion in this chapter essentially begins with findings related to this hypothesis. As the quantitative and qualitative results of research show, the hypothesis was validated, and strategy has a pervasive, strong, and ever-present impact on the OEGR of public service organizations. Both exploratory and confirmatory analysis proved that relationship, and the SEM technique established a high level of correlation between these two concepts of the formulated model. These results are in line with studies and e-Readiness assessment tools reflecting that strategy is essential for advancing e-Government adoption (Alshehri and Drew, 2010; APEC, 2008; 2000, Bakry, 2004; ICEGD, 2002; Rahman, 2007; State Services Commission, 2006; The Department's e-Government Framework, 2010; Yesser, 2005; Zaied et al., 2007). To create a clear e-Government strategy, leaders should involve all strategy factors and perspectives of CIOs, ICT managers and ICT specialists, and identify driving ICT factors.

Looking at the weights of the factors affecting OEGR, both the qualitative and quantitative findings revealed that organisations with no e-Government strategy have a low OEGR. The lack of awareness of the significance of e-Government strategy led to a lack of leadership including vision, objectives, challenges, legislation and steering committee (Azab et al., 2009; Bakry, 2004; Lee, 2010a; World Bank, 2005). Interviewees pointed out that leadership is an important aspect indicating that any organization is e-Ready; therefore, leaders should stay at the forefront of attention and action towards establishing OEGR because they are the key figures

communicating the vision, mission, and objectives of a change towards e-Government initiatives.

The positive impact of strategy on the OEGR was indeed statistically confirmed, but the qualitative analysis yielded conflicting results with many respondents confiding about the incompliance of current legislation, rules, and organizational regulations with the action plans towards OEGR increase. Many respondents indicated that few people were involved in strategy design, and few staff knew the details of the organizational strategy, which produced a negative impact on the overall implementation of e-Government initiatives and consequently, on the OEGR level. They stated that employees followed the designed strategy only in case they saw commitment from the side of their top management, and in case it was absent, the overall motivation for the transition to e-Government was low. This is particularly true in developing countries because of economic, political, accountability, procedural, and social issues. In addition, ICT specialists are unaware of the impact of e-Government strategy on OEGR because most were not involved in the strategy preparation (as confirmed by top management).

The results also confirmed that ICT specialists were only certain if there was an action plan including clear stakeholders roles and values, a timeframe, funds and high structure of information architecture (CARICAD, 2009; FY2004 - FY2008; 2008), which will allow them to offer better services and ease employee work. A future plan could be the starting point for organisational development to cover the main factors that lead the success of e-Government projects (Bakry, 2004; Lee, 2010a), such as delivery channels, integrity with other agencies' systems, portal, processes, ICT infrastructure, and human resources

Next, hypotheses H8a-f are analysed because of their direct relationship to the category of strategy's impact and other OEGR components.

H8a: The user access delivery channels should be considered on strategy in an organisation.

The next hypothesis related to the impact of strategy on OEGR is about the influence that a strategic focus can potentially execute on the user access to e-Government

services and programme in Saudi Arabia. The strategy dimension has a significant effect on user access in the opinions of both top management and questionnaire participants. Top management confirmed that strategy should include a plan for providing delivery channels for access to e-Services. The present finding complies with the opinion of Lee (2010) and Hair et al. (2010) about the overarching, pervasive impact of strategy on all dimensions of e-Government adoption.

The present findings from qualitative analysis are reasonable because a strategic plan of e-Government programme's implementation provides a roadmap for policy-makers on the way to implementing the strategy, and user access depends on the extent of being informed about, and having access to, e-Government services. The strategic task of policy-makers is to make citizens interested in using government's e-Services, which may be accomplished by means of a range of advertising and promotion activities. If these roles are performed inefficiently, the user access dimension comes under question and threatens the overall popularity and intensity of e-Services' use (APEC, 2008; Al-Nuaim, 2011; Alotaib, 2013; Dawes, 2009).

Top management and the quantitative results also revealed that the strategy of organisations should aim to facilitate e-Service delivery for citizens (G2C), government departments (G2G), businesses (G2B), and employees (G2E) by saving time, money, and effort (Zeleti, 2010). The majority of the organisations which provide e-Services delivery channels do it through SADAD (as confirmed by the top management). Organisations with no strategy for e-Service delivery channels have low readiness in user access to their services (as confirmed by the quantitative results). Such findings suggest that low OEGR has not only policy implications on the extent of e-Government implementation, but may also have financial consequences for public sector organizations in terms of their inability to arrange the provision of services to citizens.

H8b: The e-Government programme integrity of an organisation should be designed at a strategic level.

Yesser and a complex of associated e-Programme in Saudi Arabia are strongly associated with the e-Government strategy, and hypothesis H8b was verified statistically. The present finding is reasonable, since Yesser is the kernel of the whole

e-Government system in Saudi Arabia. It is Yesser to which the organizational strategy should pertain, and optimization of its operations, provision of all promised services, and ensuring the high-quality access and connectivity are among the number one priorities for strategists working on the design of e-Government organizational strategies. Technical viability of the system is at the basis of e-Government strategy, since without it, the e-Government services will simply seize to exist. Consequently, enhancing the integration of their ICT systems to Yesser's is essential, as confirmed by top management and the quantitative results (Andersen and Henriksen, 2005; Alshihi, 2005; EIU, 2001).

However, notwithstanding the fact that many interviewees assessed the value of e-Government programme such as GSN and GSB very highly, top management and the qualitative results confirmed that non-existent planning and monitoring of e-Government strategies leads to low e-Readiness. The pervasive role of strategy in the establishment of Yesser is felt in the lack of a common strategy between various public sector entities noted by interviewees, which is mainly blamed for the major delay in the transition to e-Government. Therefore, a lack of strategy affects the streamlining and integration of systems very negatively by means of crippling the information exchange and limiting access to the common data storages for some organizations lagging behind in strategy formulation and technical provision (Alshihi, 2005; Koh et al., 2007; Bakry, 2004). Top management confirmed that building the databases and applications of all public organisations at Yesser is important to achieve the goals set in the strategy. Lack of knowledge in including goals to connect to Yesser led to delay in e-Government readiness, which was also previously noted in the studies of Al-Osaimi (2007) and Lee (2010b). Therefore, there is an urgent need to facilitate Yesser's development by means of strategic rethinking of approaches to both technical and human resource provisions related to its improvement.

H8c: Portal architecture should emphasise the development on an organisation's e-Services when formulating an e-Government strategy.

The impact of portal architecture on OEGR is surely obvious, while hypothesis H8c also proved its positive and direct link with strategy. Top management and the

quantitative results emphasised the strategic role of the Web site portal architecture, since it is the mechanism that gives access for e-Government users to the actual e-Government programme (Oracle, 2010; Yesser, 2005). Top management also revealed that organisational e-Government evaluation is undertaken regularly within the MCIT.

Top management were aware of the value of strategy on portal design and OEGR, and planned to develop all ICT portal applications without delay to ensure the organisation's portal content is up-to-date. Such qualitative analysis findings suggest that the policy-makers responsible for the implementation of the e-Government programme in Saudi Arabia comprehend the need for a sound technical basis that guarantees flawless functioning of all e-Services of the Saudi government. Fortunately, the state and availability of portals were assessed highly and positively, which ensures that the core requirements for the creation of a sound e-Government program are present.

The need to focus more closely on the maintenance of high-quality portals stems directly from the close connection between well-planned strategy of e-Government integration into the Saudi Arabian public sector and a perfect, quick, and free access to the technological structures powering e-Government (Azab et al., 2009; EIU, 2001, 2005). Top management and survey respondents confirmed that the absence of a portal architecture plan in the strategy causes a lack of e-Services, while this problem may be solved by means of establishing a strong communication channel with citizens to get their feedback improves the e-Services to achieve the goals and objectives set in the strategy. These may be regarded as key priorities for the near future in the improvement of e-Service quality provided within the framework of e-Government's functioning in Saudi Arabia.

H8d: Strategy in an organisation should be reflected in the business processes tracked.

The present hypothesis was statistically verified, since there is a visible direct link between strategy and business processes. Taking into account that many processes used to be old-fashioned and backward in Saudi Arabia, the establishment of efficient e-Service structures was crippled. Therefore, the strategic approach to

changing the approach to, and facilities for, the transition to e-Government should first of all start with the strategic redesign of public sector-related processes. These processes suggest the ways in which traditional public services are provided to citizens, and how e-Commerce is organized to make transactions and interactions of citizens with the government easier, securer, and quicker (Azab et al., 2009, Grant and Chau, 2005; Kalakota and Whinston, 1997; Parasuraman et al., 1988). Without a strategic approach to processes, the rationale behind establishing e-Government may be not clear to wide categories of stakeholders, including the governmental staff and citizens.

Interviewees also revealed that organisational e-Government strategy is important in changing business processes. Some top managers mentioned the need for software applications that match the business processes of their organisations and for continuous assessment of ICT performance. Hence, the present factor of analysis appears highly significant for the OEGR evaluation because of its potential capability to reveal the present-day inconsistencies and redundancies in processes currently used in public sector organizations of Saudi Arabia. Such assessments are likely to provide highly useful insights into the possible necessary steps towards improvement, optimization, and enhancement of processes to make the provision of e-Services smoother, quicker, and more productive (Al Mansoori, 2010; Sharif et al., 2005; OECD, 2002).

Certain progress was acknowledged on the way towards process optimization, which implies that there is already a strategy in Saudi Arabia directed specifically on process re-engineering. Top management revealed that several business processes were re-engineered to achieve the objectives set in the e-Government strategy. They admitted that strategy was important to integrate business processes with the processes of public organisations. Such claims imply that governmental institutions workers understand that strategy can determine and streamline business processes to avoid duplication of work, eventually reducing the steps of the entire workflow (DeLone and McLean, 2003; Stephen et al., 2005). Interviews with top management and respondents revealed that the action plan was significant to evaluate and simplify business processes.

Unfortunately, qualitative results show that the process evolution is still under way, and much has to be done to make it happen. Top management mentioned that there are still no regular processes to assess e-Services and ICT performance because of the absence of a strategy to integrate business processes internally or with other organisations. Results also revealed that the impact of strategy on processes is weaker in older organisations, which is explained by conservatism of staff, low level of digital literacy, and a major resistance to change. Organisations in their early stages generally adopt the best practices and have clear strategies. Moreover, processes in new organisations are easier to create and adjust than in old organisations where processes are less flexible.

H8e: The ICT infrastructure in an organisation should be considered and planned at a strategic level.

Statistical analysis confirmed the effect of strategy on ICT infrastructure, thus verifying the hypothesis H8e. Interviewees also agreed that most of the necessary hardware, software, security, and networking systems were implemented. However, some organisations still need to renew some computers and printers, and to assess their systems regularly in order to provide applications such as digital signatures and smart card readers, and to automate the workflow. Hence, the problem of ICT infrastructure's enhancement in some government organizations is realistic for Saudi Arabia, and has to be strategically solved.

The strategic approach to improving ICT infrastructure should be first of all solved by means of enhancing provision of computers and other equipment to public sector agencies. Participants revealed the importance of having a strategy that ensures the availability of the latest technologies and provides proper maintenance, which are not always available due to bureaucratic complications. They also emphasised the need for a strategy to allow the integration of ICT with other organisations. Top management confirmed that organisations with no clear strategy for ensuring ICT use will suffer from the poor status of their systems and will not benefit from their availability, resulting in low OEGR. In some organisations, only a small number of employees have access to the Internet, while other employees use it for limited tasks (confirmed by the quantitative results).

H8f: Human resources should be highlighted in the development as part of management awareness, employees' ICT skills, and in training and development when preparing an e-Government strategy.

Hypothesis H8f was verified in this study; quantitative results and top management confirmed the importance of strategy on the human resources, which is mostly manifested in the form of recruitment, training, and hiring outsourced ICT professionals. Interviewees revealed an in-depth understanding of the value of human resources in the success of e-Government by hiring skilled employees and training current employees (Rahman, 2007; DeLone and McLean, 2003; Bakry, 2004; APEC, 2008; Azab et al., 2009). Top management and questionnaire participants noted that training courses are provided regularly to enhance employees' ICT skills. However, they revealed that government organisations sometimes lack the ICT staff to carry out tasks relating to hardware, software, networking, security, and the help desk.

Leadership is a significant factor in the strategy's impact on HR, because an organisation's leader must involve motivating employees toward e-Government (confirmed by the interview and survey results) (Haug et al., 2011; Lee, 2010a). Leadership thus acts as a mediating link between strategy and human resources by communicating the strategy and motivating, inspiring, and empowering employees to follow it. Top management and questionnaire respondents confirmed that e-Government strategy led the reforming of business processes by assigning the right employees to the proper positions and by demonstrating control and accountability. Furthermore, e-Government strategy has a strong effect on employee's behaviour because of the hierarchical structure of the government organisation, which makes employees react positively to changes required by management (Yesser, 2005; Bakry, 2004; Azab et al., 2009).

Interviewed representatives of top management revealed that it is important to create understandable practices and examples for employees regarding the implementation of e-Government strategies. For instance, some of the interviewees reported their practices of encouraging employees to communicate internally via the organisation's LAN. This way, they showed to the staff how e-Government can be gradually introduced in their daily activities, which obviously increased compliance and

commitment and human resources, and led to quicker and smoother transitions to higher OEGR levels. Such recommendations may be used by other public sector organizations that still struggle to motivate employees for e-Government adoption.

6.3 Nature of Factors' Influence on OEGR

In line with the impact of strategy on the key dimensions shaping the OEGR of public sector organizations in Saudi Arabia, each of these dimensions exerts its unique impact on the OEGR. Hence, these factors' influence and challenges unique for Saudi Arabia are discussed in this section. The findings of qualitative and quantitative results are triangulated, and inferences are supported with prior literature findings.

6.3.1 Impact of User Access on OEGR

H2: User access should be included in an OEGR assessment to provide service delivery channels to citizens, other government departments, business sectors and employees.

Hypothesis H2 has been verified both qualitatively and statistically in this study. The user access dimension has a high impact on OEGR in many government sectors (qualitative findings), because the user access structure is the gateway to the services the organisations offer. These findings are in keeping with prior research (Abdalla, 2006; AlMansoori, 2010; Alotaib, 2013; Alshehri and Drew, 2010; Dawes, 2009; Grimsley et al., 2007; Zhang et al., 2005). Specifically, AlMansoori (2010) and Alshehri and Drew (2010) view different channels and e-Government readiness as interrelated in Saudi Arabia. In many government organisations, multiple departments are part of the service delivery and they manage their services between themselves (as confirmed during the interviews). As departments always have a considerable degree of self-government, agreements and contracts can provide some support; however, co-operation is a solution.

However, together with a positive assessment of user access levels given by respondents in the interviews, the statistical analysis of questionnaire findings showed that e-Service provision was at a very low level in Saudi Arabian public sector organizations. When investigating e-Services, descriptive statistical results

(Figure 5-7) show that organisations do not offer any G2C, G2G, G2B or G2E e-Services. At 14%, 24%, 37% and 40% respectively, the organisations have a low level of e-Government readiness. These findings support prior research on the barriers to e-Government programmes' implementation stemming from poor user access opportunities (Ebrahim and Irani, 2005, IDA, 2004; Homburg and Bekkers, 2002; Guo and Lu, 2005; West, 2004). The results indicated that more efforts should be considered in providing e-Services particularly G2B and G2E which rank high percentages.

SEM applied for the refinement of the conceptual model for OEGR level assessment has shown no direct link between user access and OEGR. One possible explanation is that when a particular user access becomes compatible with the organisation's current work system, and the organisation believes it would benefit from this access, its complexity becomes a less important issue. Quantitative findings also revealed that G2B is not significant; this may be due to a lack of awareness of private sector advantages that can play an important role in improving the OEGR (Alshehri and Drew, 2010). These should be considered in future research in Saudi Arabia. Organisations which do not offer suitable e-Services and multi delivery channels have difficulties in dealing with their stakeholders and have low e-Government readiness, such as long queues of people waiting to complete their procedures (as confirmed during interviews). In addition, top management confirmed the significance for OEGR to provide G2C, G2G, G2B and G2E e-Services to their stakeholders.

Interview analysis nevertheless confirmed that G2C, G2G, G2B and G2E need to have a multi delivery channels such as payment through the SADAD system, including Web sites, ATMs, WAPs, call centres and kiosks (Ebrahim and Irani, 2005; IDA, 2004). The interviewees claimed that user access is one of the key dimensions according to which the two-way communication with customers and citizens can be established. E-Government may succeed only in case its services are demanded by people. Therefore, user access is an essential alternative construct for measuring the effectiveness of e-Government programme. In addition, the survey results confirmed that only ATMs, WAPs, and call centres are important, thus focusing on the technical side of the issue. Other channels are ignored, which is consistent with the findings of Alsobhi et al. (2009) that little attention has been paid

to usability, accessibility and the availability of e-Services from an e-Government user's perspective in Saudi Arabia.

As confirmed by interviewees, many government organisations co-ordinate only at the application level. This can gain more focus by mapping all delivery channels to the same application and through synchronising multiple application systems. This can be done in real time so that the information is integrated over all channels. However, many public organisations still work batch wise, as a result causing delays in synchronisation. In the public sector an integrated approach needs a major change in work flow, as clarified in the Processes Section 6.2.1.5.

6.3.2 Impact of e-Government Programme on OEGR

H3: Organisational integrity with a national e-Government programme should be included in an OEGR assessment of an organisation.

The impact of Yesser on OEGR proved to be supported, thus verifying hypothesis H3 by both interviews and statistical analyses of the designed model. Both interviewees and questionnaire participants confirmed that availability, GSN, and GSB are essential for improving OEGR. These findings resonate with claims of Almarabeh and Abuali (2010) who state that availability, GSN, and GSB to exchange connectivity and e-Services with Yesser are crucial factors necessary for shared activities and assets. However, these features' necessity is in conflict with the real-life inefficiency of the Yesser and related services, as pointed out by the interviewees.

The literature has established the role of technology in advancing knowledge-sharing and co-ordination between government organisations, and particularly among the different team members (Ebrahim and Irani, 2005; ICEGD, 2002; Layne and Lee, 2001; OECD, 2003; State Services Commission, 2006; The Department's e-Government Framework, 2010; World Bank, 2005; Yesser, 2005; 2013). The programme was based on theories such as e-Government vision, mission, standards and framework (Yesser, 2013). On the other hand, many top managers in the public sector confirm that the e-Services provided by Yesser and its integrity between other e-Government projects are lacking. They felt this delays OEGR, and the integration of different independent agencies and networks within the public sector is missing. It

is possible that a Yesser with more power, authority and qualified staff can lead in this role.

Such discrepant findings of the qualitative and quantitative portion of research suggest that ideally, e-Government programme are the core of the OEGR, since they are actually its outcome and purpose. However, despite the widely acknowledged importance of viable and functioning e-Programme and services on the way to increasing OEGR, few of these are achieved in reality, especially in developing countries ensuring little coordination and integration among these services. Hence, there is a need to develop and connect to the SSO of the national portal (as revealed from the qualitative and quantitative results). Top managers felt that organisations should develop their ICT infrastructure to successfully integrate different government agencies through Yesser (Sharifi and Zarei, 2004).

The quantitative results revealed that the GSN has a higher impact on OEGR (H3) by providing a secure communications network, particularly for e-Government transactions. This supports the finding that a national e-Government programme's perceived advantages and integrity are interrelated and related to OEGR (AlMansoori, 2010; Alshehri and Drew, 2010). Interview results also supported that suggestion, but many interviewees voiced concerns about slow data flows, lack of connectivity, and a failure of GSN to provide all promised services.

The GSB offered by Yesser is important as the middle platform for the integration of government e-Services and transactions (as revealed from the quantitative results). Many top managers confirmed the need for better integration in order to connect to a GSB that is better than what Yesser provided, to exchange information with other organisations which will improve organisational OEGR. This finding agrees with Alshehri and Drew (2010) who argue that more effort is required to integrate with Yesser.

Both interviewees and the quantitative analysis revealed that Yesser relies on Al Elm Security in order to provide e-Services via the Yesser portal. In reality, Al Elm assumes Yesser's role in co-ordinating the integrity between the Ministry of the Interior and other government organisations and in helping public organisations update data and provide e-Services. Al Elm has this power since it belongs to the Ministry of the Interior. Al Elm offers G2C e-Services such as civil affairs, traffic

and labour importation (in the form of queries and making appointments). In addition, Al Elm offers G2G e-Services to the Ministry of Health (health insurance validity for residents), Labour Office, Ministry of Commerce, and the Retirement Authority. Furthermore, Al Elm offers G2B services such as the Muqeem passport system for entry visa and other e-Services including public query, eligibility for Hajj, eligibility for visa, insurance validity for residents, query exit/re-entry visa, and the Tamm system for traffic offences and transferring cars. This causes a clash in responsibilities between Yesser and Al Elm.

6.3.3 Impact of Portals on OEGR

H4: An assessment of the effects of an organisation's portal quality on OEGR should include factors such as availability of portal, layered structure, and SOA.

The portal architecture and OEGR have proved to have a direct, stable, and positive linkage, thus verifying hypothesis H4 by both interviewees and survey respondents. An organisation with a good quality portal can incorporate different services on the Web site (Molla and Licker, 2001). Stakeholders find it easy to retrieve their data and scan documents (confirmed by quantitative results). The site can control data entry or send text messages reminding citizens to follow up their requirements. Interview results confirmed the results of prior studies on the importance of having a high quality portal to offer e-Services (Accenture, 2004; Alotaib, 2013; Deloitte Research, 2000; DeLone and McLean, 2003; Dörr et al., 2013; Maheshwari et al., 2009; UNDPEPA/ASPA, 2002). Many interviewees stated that the efficiency of provided structure and the introduction of SOA increased user participation and availability of services. Similarly positive results were achieved by means of analysing the relationship between portals and OEGR statistically; the SEM refinement of the conceptual model revealed a high level of impact and a strong relationship between the variables.

Both top management and questionnaire participants agreed that the availability factor of the portal dimension/construct is important to provide high quality SSO, availability, accessibility, content, layout, navigation, consistency, and updates. These elements reflect use and quality of portal availability. These findings confirmed the prior studies of Maciaszek (2004), Azab et al. (2009) and Dörr et al. (2013). Therefore, even despite the fact that opinions were mostly positive on this

research dimension, some interviewees pointed out the need to increase portal quality and availability in distant geographical regions, which is a serious problem in the Saudi Arabia, with some urban areas enjoying a high level of ICT development, and others suffering from a total lack thereof.

Qualitative and quantitative results confirmed the importance of organisations to have advanced and reputable operating systems and software applications installed in the back-end office in order to provide a high standard portal layered structure that allows organisations to offer quality e-Services. Both stages of research confirmed that a SOA approach supports ICT with service delivery objectives and allows different agencies to reprocess developed assets, by developing single and multiple transactions, multiple databases, and integrity between the agencies. This agrees with prior studies (Behara et al., 2009; Oracle, 2010). The existence of a proficient Web site has a strong effect on OEGR, since it increases connectivity and enhances the two-way communication modes between governments and their citizens. E-Services can be improved by also paying attention to usage analysis and receiving feedback through Twitter and Facebook to evaluate the Web site.

6.3.4 Impact of Processes on OEGR

H5: Processes should include important factors such as: support processes, process automation and data and information flow in an OEGR assessment.

The impact of processes on OEGR was easily observed at both stages of research, thus verifying hypothesis H5. This result confirms the literature review findings stating that enhancements in internal integrations of government might not be realised if they fail to include a model like BPR (Alotaib, 2013; Lee, 2010b; Molla and Licker, 2001). One of the interviewees claimed that his/her organization did not apply any BPR system, which was undoubtedly manifested in its OEGR level. Therefore, the need to attract efficient processes and process innovation systems into e-Government transfer is evident across public sector organizations.

Reviewing the effect of business processes on OEGR (H5) by the survey questionnaire confirmed the processes' positive and direct impact. Many organisations changed work flows of business processes to prevent mistakes and redundancy of data. Also, the quantitative results show that fully, partially, and not

automated e-Services (for organisations having a 1–25 range of e-Services) are at 1, 30 and 69 per cent respectively. In line with the literature, the automation of services requires more effort to achieve strategic goals in providing a reasonable percentage of automated services directed to OEGR (Macasio, 2009b; Lee, 2010b). Implementing high quality Web-based applications and databases led to re-engineered processes to ease procedures and workflows, documents steamline eventually providing a high level of automated systems. This supports prior studies (Moodley, 2003; Lee, 2010b; Ebrahim et al., 2006; Dörr et al., 2013).

Top management confirmed that many business processes were re-engineered to ease processes carried out by citizens and other stakeholders (Azab et al., 2009; Behara et al., 2009; Lee, 2010b). However, they also pointed out (which agrees with statistical findings) that the evolution and update of processes is far from finished, and much more has to be done to make the ICT-related processes efficient and updated. There is an agreement of both qualitative and quantitative results of importance of implementing ICT applications such as core business, ERP, EAI, CRM and Web-based applications; this also confirmed the literature review. It is possible that enhanced, optimized processes may help counter the high levels of bureaucracy typical for public sector organizations, which is a necessary change taking into account the inability of certain staff members to assist citizens because of the ineffective and slow processes of data flow, lack of accuracy, timeliness, convenience, software applications, and quality of data. This is consistent with prior studies (Azab et al., 2009; Bazerman, 2010; Mumick et al., 1997) and the quantitative results.

6.3.5 Impact of ICT Infrastructure on OEGR

H6: Assessing ICT infrastructure effect on OEGR should comprise several factors such as the quality of: hardware, software, connectivity, security measures, and operations provided by the ICT department in the organisation.

The impact of ICT infrastructure on OEGR was confirmed to be high due to the value of technology, which is noticeable to the top management, thus proving hypothesis H6. This is in line with prior studies that e-Government could never be realised without implementing ICT (Dörr et al., 2013; IBM, 2011; World Bank, 2006). All interviewees confirmed the findings in the literature that ICT

infrastructure is critical to support information systems and applications that are essential for OEGR (Ebrahim et al., 2006; IBM, 2011; World Bank, 2006). Having high availability of hardware, software, and a network means having a high ICT infrastructure to boost e-Government readiness. When the survey questionnaire investigated network coverage, results showed that 81% of government organisations have over 80 desktops per 100 employees, while the coverage of LANs and WANs is high at 81 and 78 per cent respectively. The ease of access to a communication network is also high at 80%. The percentage of employees who have Internet access and e-Mail fell between 61 and 69, while employee's access to PCs at home was a relatively low 45%. In addition, qualitative and qualitative results revealed that connectivity is still poor in rural areas so this affects negatively integrations between organisations and their branches as well as e-Services provided to citizens in that areas. This confirms the significance of connectivity on OEGR.

The focus on ICT as a key dimension of OEGR evaluation is reasonable because ICT is generally the backbone of e-Government implementation. Without ICT and equipment empowering it, there would be no e-Government programme; therefore, it is reasonable for public sector agencies to pay specific attention to the provision of sound ICT facilities. The results revealed the need to improve organisations' ICT security systems and have better policies, awareness and security solutions tools. This finding agrees with Conklin et al. (2004), Pfleeger and Pfleeger (2003) and Li and Suomi (2009) who suggest that ICT security solutions are vital in improving an organisation's e-Readiness. The quantitative results confirmed the literature review on the importance for set processes to provide day to day work, backup, redundancy, and upgrades of systems (Patrizio et al., 2004; Pfleeger and Pfleeger, 2003).

Both quantitative and qualitative results of this study suggest that the OEGR level of a public sector organization can be effectively increased if this organization invests into better hardware, ICT software, and security systems. Strong and efficient ICT infrastructures are likely to speed up and simplify the majority of organizational operations, such as statistical compilations and service provision, which is a generally positive trend in reforming the activities of public sector entities. The qualitative and quantitative results showed that organisations with a high level of ICT infrastructure have a better level of OEGR, which is reasonable because automation and ICT proficiency are always connected with higher productivity and

enhanced performance (Cohen, 2004; Snellen, 2007). The availability of such an efficient infrastructure also has a large effect on e-Government performance.

6.3.6 Impact of Human Resources on OEGR

H7: An OEGR assessment should take into account different aspects related to the employees, such as e-Government awareness, employees ICT skills, and training and development.

The significant impact of human resources on OEGR was confirmed by both top management and participants in the questionnaire, proving hypothesis H8. This is well aligned to prior studies (APEC, 2008; Azab et al., 2009; Center for International Development - Harvard University and IBM, 2007; Molla and Licker, 2001; Rahman, 2007; World Bank, 2005; Yesser, 2013) underlining the key impact of people operating software and hardware for the achievement of OEGR purposes. This is due to the fact that if policy makers, managers, or employees are unaware of the advantages of e-Government, they will not have the incentive to transition to e-Services (Al-Omari and Al-Omari, 2006; Katib, 2001). A low level of awareness about the need for ICT use and e-Government implementation causes delays in the process, which is likely to cause inefficient fund allocation and the overall stagnation of policy implementation. Moreover, interviewees stressed the positive impact of top managers' commitment to the change on the employees' willingness to participate in the transfer (APEC, 2008; Azab et al., 2009; Bakry, 2004; Delone and McLean, 2003). Hence, specific efforts should be made to increase awareness among staff, as well as train staff on ICT, hardware-software use, and e-Government fundamentals to empower them and make them a part of the change process.

Employees of the governmental organizations are the key agents implementing the transfer to e-Government through their daily actions. Therefore, the basic precondition of success is to help them understand what is needed from them, and what personal contribution they can make to the transfer towards a knowledge-based society working with ICT at ease (Stephen et al., 2006; APEC, 2008). Both top management and questionnaire participants confirmed that having a high level of ICT skills leads to a high level of technical support that can play a significant role in helping the entire ICT community achieve OEGR. However, finding qualified staff is very hard in Saudi Arabia, which implies the need to establish high-quality training

course and facilities for employees of governmental organizations to facilitate their transition to ICT proficiency.

Top management and questionnaire respondents confirmed the lack of ICT-qualified employees in the public sector. Both qualitative and quantitative results also confirmed the importance of providing suitable training courses for employees to advance an organisation's e-Readiness (The Department's e-Government Framework, 2010; Molla and Licker, 2001; World Bank, 2005; Zaied et al., 2007). The quantitative results showed that ICT skills, technical experience, expertise, number of ICT jobs and number of qualified ICT employees and end users' computer skills in government organisations ranged from 44 to 52 per cent. More effort is required to improve their skills. ICT security training was a bit low at 49%. Training to keep ICT skill sets current averaged 69%, in contrast with the low average of training in advancing employees' abilities to utilise e-Services. The lack of ICT-qualified employees is one of the main barriers towards improving OEGR.

6.4 Integrated Model for OEGR Assessment in Saudi Arabian Public Sector Organizations

Triangulation analysis was employed to obtain the final model that best explained the data (Garson, 2011). All factors elicited from the literature review were found to be highly relevant for the OEGR assessment, as the qualitative interview analysis has shown. However, statistical quantitative analysis verified only twelve of the thirteen hypotheses, urging the researcher to revise the suspected relationships within the final variant of the OEGR assessment model. Twelve of the standardised path coefficients were significant, ranging from 0.29 to 0.78. This indicates that employees' feedback towards the research constructs was highly positive. In contrast, the model construct with a non-significant path (user access to OEGR) was the quantitative model (see below, Figure 6-1: Revised model for Saudi Arabia).

The present change in the model is made only due to the initial testing thereof, on the present study's sample, and its relevance for OEGR may not be fully discarded only on the basis of one study. Such a weak relationship may be due to misunderstanding the user access questions or because the same perception towards the model's constructs was not expressed by the employees during informal conversations with them. Perhaps user access is compatible with e-Government's internal environment,

and as the organisation becomes confident that its use has improved OEGR outcomes, the factor's overwhelming processes and procedures are seen as less problematic.

Most employees were satisfied with most of the factors under each construct, but the ideal positive contribution these factors can provide for OEGR was often counterbalanced with the real-life estimates of these factors' implementation in the Saudi Arabian public sector organizations. It is vital to keep in mind that the analysis in this study did not aim at analysing the current OEGR in these organizations, but identified the ways in which included factors can possibly affect OEGR in theory. Consequently, proper discretion has to be exercised when applying the model in real-life assessments, since the identified factors promise a positive improvement of OEGR only in case they are properly implemented, which is still troublesome on many points in Saudi Arabia.

Alongside with revising the model on disjoining the user access factor with OEGR, the researcher also specified some additional operational variables for assessment of OEGR with this study's model specifically in Saudi Arabia. The major reason for these variables' addition is that qualitative analysis revealed certain challenges for OEGR experienced specifically by Saudi Arabian organizations in the public sector. Hence, a more precise assessment may be done only in case these challenges are properly taken into account.

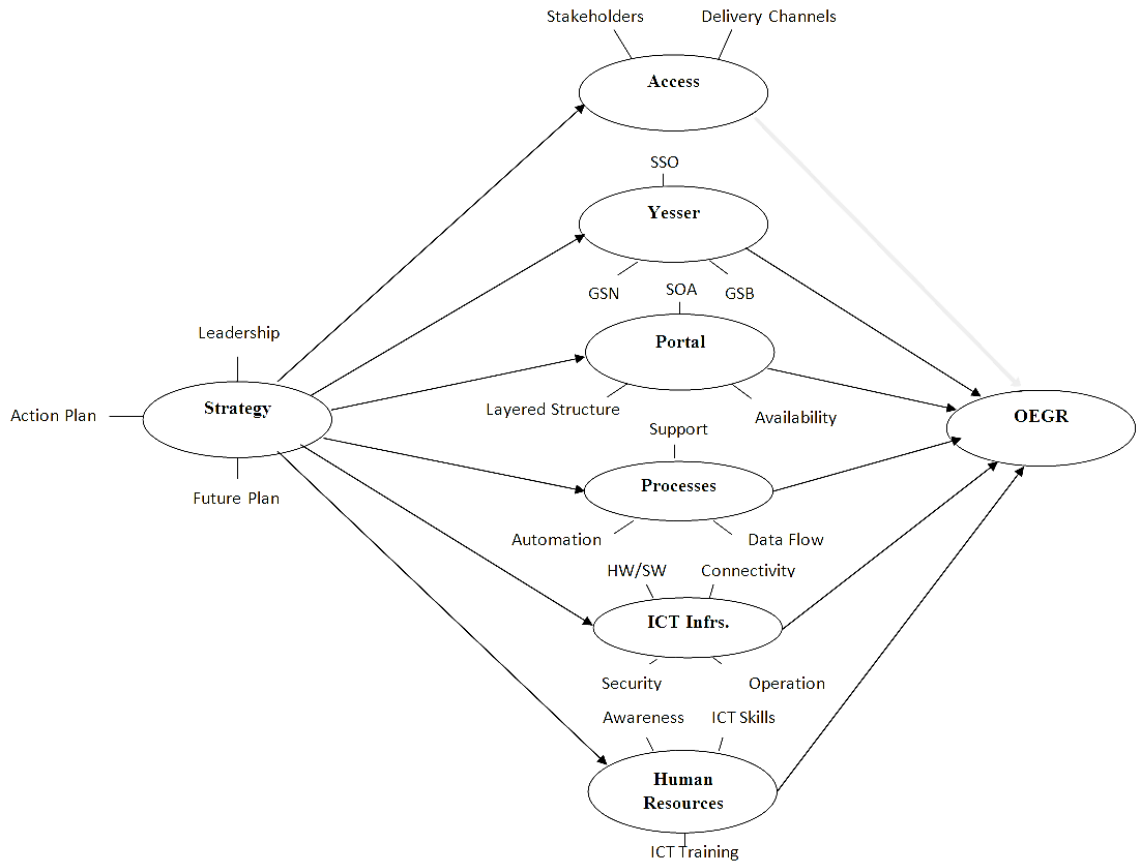


Figure 6-1: Revised model for Saudi Arabia

As one can see from Figure 6-1, the present integrated model has certain changes as compared to the model designed in upon the results of chapter 2 and 4. The changes made with reference to the unique Saudi situation are as follows:

1. The concept of strategy was found out to be much more multi-dimensional than initially supposed. A professional e-Government strategy should have a direct impact on user access, national e-Government programme, portal, processes, ICT infrastructure and human resources.
2. The factor of e-Government programs was found to be more diverse than initially integration was included under GSN and GSB factors in the model.
3. The factor of ICT Infrastructure was also found to be associated with hardware and software availability and connectivity in distant geographical locations, which turned out to be a topical and urgent problem for Saudi Arabia.
4. HR factor was also found associated with availability of ICT professionals and incentives to attract and retain qualified personnel (competitive salaries) variables included under ICT skills and training and development factors.

User Access has disjoined with the OEGR because of the proven lack of impact on it. However, its connection with Strategy was retained, mainly because many interviewees agreed that strategy mattered much in the formation of sound and effective user access channels on the way towards OEGR. Qualitative analysis of interviews has revealed that both stakeholders and delivery channels are effectively utilized in Saudi Arabia, and play key importance in the formation of the user access quality in this country. Interviewees claimed that user access possesses strategic importance in the organization of G2G, G2C, and G2B e-Service provision, which are mainly guided by the e-Government strategy. The importance of user access in OEGR research was also supported by the findings of APEC (2008), Al-Nuaim (2011), Ebrahim and Irani (2005), Brannen (2001), and many other researchers. Therefore, it seems necessary to maintain user access as a part of the OEGR assessment model at least as a strategy-related factor of influence shaping a certain aspect of e-Government services' formation and provision.

It is also essential to keep in mind that people using services of e-Government shape demand for it, and user access plays a key role in the formation of that demand. In case services are limited, slow, and use poor data flows, the interest of customers is likely to experience a gradual decrease, which will make the overall e-Government effort ineffective. The Saudi Arabian government has been investing heavily into the establishment of high-quality, effective user access channels, which was Al-Elaiwi (2006), Bawazir (2006), Kostopoulos (2006), Webster (2002), and other researchers. Intense effort was directed at computerizing the Saudi nation, equipping private and public bodies with computers and ICT infrastructure, and making the Internet a regular part of the Saudi population's life.

It is essential to understand that this study is the first one of such a kind in the field of testing this particular OEGR model, since it was developed in the process of conducting the present research. Consequently, the fact that the present sample denied the role of user access in OEGR does not prove its low importance; further replications of this study with other samples may show a more pronounced connection between user access and OEGR. Moreover, there is a cultural challenge that may produce a certain impact on the user access and user interest in e-Government services. Saudis are mostly a conservative nomadic nation adopting the

innovative technologies of different kinds with caution and reluctance. Therefore, the user access factor is strategically important and cannot be fully avoided in the OEGR assessment model.

Strategy. As it has already been noted in the present chapter's analysis, strategy is a meta-dimensional producing its pronounced impact on OEGR itself, and on each factor affecting OEGR studied in this model. However, the initial literature review of Strategy as a dimensional affecting OEGR has proven to be incomplete. An e-Government strategy directly affects OEGR, and it indirectly affects it through the other six dimensions: user access, national e-Government programme, portal, processes, ICT infrastructure and human resources. This led to the six hypotheses H8a-H8f.

E-Government Programme. The set of e-Government programme of any country is tooled to ensure availability of digital data for all agencies and institutions that may require it for working with citizens and providing them with high-quality services. The strategic role of e-Government programs is also to raise awareness about the potential benefits of e-Services among both the employees of public sector organizations and citizens (Yesser, 2005, 2013; OECD, 2003; Alshehri and Drew, 2010). Efficiency of e-Government programs is traditionally measured with the help of such constructs as SSO, and the particular usability and effectiveness of specific programs (in this case, these are GSN, Yesser, and GSB).

Nevertheless, respondents with whom the interviews were conducted repeatedly named a variety of problems that impaired efficient functioning of e-Government programs in Saudi Arabia. In terms of Yesser operation, interviewees pointed out the slow speed of its implementation, independent applications and networks of each Saudi ministry, one-way interaction with Yesser that public sector organizations currently have, and a lack of Yesser's participation in strategy formation for a transition to e-Government. Availability of services was assessed moderately, while the work of the GSN was criticized for delays in connection and limited service provision. The operation of GSB was also criticized, mainly because of the limited scope of provided services. This delay of implementation is due to clashes in roles and responsibilities between Yesser and Al Elm, so this variable included under Availability factor in e-Government programme.

The present evidence elicited from the interviews is in line with prior literature findings related to the need for a strong technical and ICT basis for the introduction and provision of e-Government services to the population. The e-Government initiative may succeed only in case there are people who can successfully operate the established e-Services and e-Programs, while absence of integration and reciprocal communication among technical facilities brings about the overall failure of e-services to fulfil their overall purpose and functions (Chappell, 2004; Almarabeh and Abuali, 2010). Hence, in the light of these findings, the researcher has decided to add integrity variable between public organisations and Yesser for the sake of assessing not only the theoretical, but also the practical quality and success of e-Government initiatives' implementation.

ICT Infrastructure. The importance of establishing a sound and well-operated ICT infrastructure is beyond any doubt in the discussion of e-Government initiatives' implementation. Without workable ICT, e-Government programs will have no sources and connectivity for functioning, and neither the public service staff nor the citizens will have access to them. Moreover, if the ICT infrastructure is dysfunctional within a certain country, various public sector agencies and citizens are likely to have different quality of access to e-Services, which will ensure data flow disruptions, service inefficiency, and problems with data storage and retrieval (Cohen, 2004; Andersen and Henriksen, 2005; APEC, 2008; EIU, 2001). The traditional components of ICT infrastructure assessment include hardware and software, connectivity, security, and operation. Nevertheless, interviews revealed a specific problem that Saudi Arabian ICT infrastructure has faced – the inability to create efficient levels of connectivity in distant geographical regions. Therefore, this challenge should be efficiently revealed in the OEGR assessment model designed specifically for the Saudi Arabian public sector organizations.

Human Resources. The interview analysis has revealed that human resources are the major problem on the way towards establishing effective e-Government services in Saudi Arabia. A great number of researchers underlined the extreme strategic importance of human resources for implementation of any organizational change. Moreover, HR is the key assessment dimension in the organizational e-Government readiness research (APEC, 2008; DeLone and McLean, 2003; Molla and Licker, 2003; State Services Commission, 2006). However, research also indicates the major

problem with awareness among public sector organizations' staff and the low level of their skills that hinder e-Government implementation (Azab et al., 2009; Zaied et al., 2007; Al-Omari and Al-Omari, 2006).

Empirical and theoretical research findings have shown that a transition to e-government should be accompanied with HR update as well, with the provision of relevant technical skills for the employees of public sector organizations, training and development for the HR, and empowerment of employees by giving them necessary skills instead of hiring outsourced professionals. In addition, interviewees claimed that the lack of ICT professionals in the public sector is primarily predetermined by low salaries and more competitive earnings provided by private sector organizations. In connection with these findings, the researcher has decided to complement the HR factor in the OEGR model with such variables as Availability of ICT professionals and Incentives to attract and retain qualified personnel.

6.5 Summary

This chapter discussed the findings of the study by comparing the qualitative data collected from interviews with that gathered from the questionnaire. This chapter also compared the overall OEGR model of Saudi Arabia. Results drawn from the literature showed that all research hypotheses were confirmed except the path of user access to OEGR in the quantitative results. Finally, this led to the development of a final model for assessing the OEGR of public organisations in Saudi Arabia.

The final chapter will revisit the objectives and questions of the research. It will also summarise the complete research project and provide recommendations for organisations and decision makers. Finally, it will discuss the main strengths, limitations and future research directions.

Chapter 7: Conclusion

7.1. Overview

This chapter concludes the study. It revisits the research aim and objectives and the research questions. It then explains the key findings and the theoretical contribution of the study. The chapter then offers recommendations for Saudi Arabian organisations and policy makers. It discusses the research strengths, limitations, and finally suggests directions for future research.

7.2. Conclusion

The need for governments to transfer to ICT-mediated communication and service provision to their citizens is indisputable nowadays, taking into account the global transition to a knowledge-intensive society. Such ICT-mediated communication is quicker and more convenient, which may make the public sector organizations more engaging the citizens, increase the awareness of the latter regarding certain opportunities they have, as well as increase the quality of provided services.

All these factors shape the need for establishing strong conditions conducive for the establishment of e-Government facilities in each country including governance, accountability and efficiency of governmental activities. Another persuasive argument for the increased attention to e-Government is the potential of significant financial savings and increased revenues for governmental agencies. Alongside with the enhanced public participation and easier access to services, e-Government becomes a pleasing and attractive target for all public sector agencies in most countries.

Nevertheless, ICT development and promotion face certain challenges in developing countries. One of such examples is Saudi Arabia, a developing country with a tremendous development potential that nevertheless lacks substantial resources such as awareness and commitment of staff, essential ICT training, and technical connectivity facilities in certain distant rural areas. Moreover, Saudi Arabians are conservative and do not adopt new solutions and technologies quickly; therefore, the Saudi administration also has to increase the awareness of e-Government benefits to its citizens in the transition to e-Government.

The new ICTs introduced across the globe have provided enhanced opportunities for the governments to increase their operational efficiency, effectiveness of service provision, and to reduce the costs of services. However, such systems do not always work properly, and require effective measurement tools that would consider various factors affecting e-Government success. The common reason for such programs' inefficiency is a lack of technical provision of software and hardware, inefficient and dysfunctional portals and connectivity channels, absence of Internet access in certain distant and rural geographical areas, and poor digital literacy and training of personnel in governmental organizations crippling and delaying the system's implementation. Such dysfunctions and barriers have to be identified and addressed by comprehensive assessment models developed specifically for e-Readiness and e-Government evaluations.

The majority of traditional e-Government readiness tools have focused on the external, macro-factors that consider the context in which the public and private sector organizations function. Such models possess certain research and empirical significance because they help to gain an idea of the overall environment in which organizations operate and transfer towards e-Government services. However, many developing countries like Saudi Arabia investing heavily into e-Government development do not observe the expected results and returns. Such a situation may be explained by the overarching impact of internal factors, the organization itself, shaping barriers to e-Government programs' implementation. For the sake of identifying the extent of readiness for e-Government, which was termed Organizational e-Government Readiness (OEGR) in this work, the conceptual model including internal organizational factors was developed for conducting assessments in the struggling public sector organizations on the way towards e-Government.

The OEGR model proposed in this dissertation has been developed on the basis of the preliminary literature review on assessments of e-Readiness and e-Government initiatives. As a result of literary analysis, the researcher has elicited seven key factors that have to be considered within the framework of internal OEGR: strategy, human resources, user access, e-Government programs, processes, portals, and ICT infrastructure. These factors influence organizational readiness. Absence or insufficiency of some of them leads to e-Government failure or at least a substantial delay in implementation.

Each of the factors analysed within the proposed OEGR model produces a unique, strong impact on the overall readiness, though strategy has a hierarchically dominant position over all other factors, presenting a meta-factor of OEGR. Therefore, a specific focus should be made on the development of a strong, well-formulated, and wisely designed strategy for e-Government implementation, and to ensure commitment to its implementation among all levels of organizational management. A strategic direction appears to be a backbone of the whole integration process ensuring success of e-Government services and initiatives in the long run.

Qualitative analysis of data from interviews with public sector employees associated with e-Government implementation supported all factors initially included by the researcher into the OEGR model. Nevertheless, it also revealed certain challenges and problems that Saudi Arabia specifically faces on the way to e-Government. For instance, the factors of strategy, user access, and portals found only positive remarks and feedback, with the majority of interviewees confident in their efficiency and workability. However, the factor of e-Government programs faced much criticism because Yesser, the Saudi Arabian e-Government system, was blamed for not fulfilling the given promises, not providing the expected services, not ensuring integration among public sector agencies, and for slow implementation. Delays were reported in connecting with GSN and GSB, which limited service provision and created negative experiences with the use of e-Government programs in Saudi Arabia. The problems for factors of human resources, processes, and ICT infrastructure were identical – absence of highly qualified employees to operate new ICT equipment and promote, enhance, and speed up the implementation of e-Government programs in Saudi Arabia.

However, despite certain specific revelations during the qualitative analysis, the researcher still found support for all seven factors' direct relationship with the OEGR of any public sector organization, which provided a sound basis for the inclusion of all those factors into the model for subsequent quantitative testing. Another valuable finding suggested by the qualitative analysis of phase one showed that strategy is a meta-variable occupying a higher place in the hierarchy of the selected factors' impact on OEGR. Strategy was associated with all other six factors, and was found to determine their influence on OEGR. Therefore, the conceptual model of OEGR assessment was refined to reflect the overarching impact of strategy on all OEGR-

shaping factors. Moreover, the details provided by respondents of the qualitative part enabled the researcher to operationalize variables within each of the factors for their precise empirical measurement.

Those operationalized variables were further tested in the quantitative statistical analysis part with the help of exploratory and confirmatory factor analysis, and further on SEM. The findings of the quantitative analysis suggest that strategy is indeed positively correlated with all factors affecting the OEGR level, and OEGR directly. However, one of six factors, namely user access, was found to be poorly associated with OEGR assessment. Such a finding implies that user access is more of an external variable related to the customers' access to e-Government services, and it can rarely be affected from the inside of governmental agencies organizing the transition. Citizens' access may be poor due to their lack of digital literacy skills, residing in geographically distant and poorly equipped regions, as well as a personal unwillingness to involve in the use of governmental e-Services. Therefore, it is suggested that user access is excluded from the model of assessing OEGR proposed in this study because of its low level of influence on the overall OEGR of any particular public sector organization.

7.3 Revisiting the Research Aim and Objectives

It is useful to revisit the research aim and objectives before concluding the main findings of the research. The aim of this research was to provide an integrated model for assessing organisational readiness of e-Government that represents the association of relative components in a developed and a developing country's public sector and particularly in Saudi Arabia. The present aim was achieved in Chapter 6, discussion, by means of integrating the findings of qualitative and quantitative phases of this research and adding some contextual factors characterizing the transition to e-Government in Saudi Arabia in particular. Such factors included, for instance, a need for a specific focus on the training and staffing of governmental organizations because of a pronounced lack of qualified ICT professionals, educating the governmental officials and Saudi citizens about the usefulness and process of e-services for increase of participation, and providing enhanced equipment and connectivity in distant geographical locations for the sake of ensuring that e-Government services are available in the whole territory of the KSA. Finally, the

integrated model for OEGR assessment for Saudi Arabia also has an additional variable of integration among agencies assessment, since many accusations of one-way communication and lack of integration were voiced by Saudi Arabian ICT professionals interviewed for this research.

The first narrow objective of this study was to determine the critical factors and variables for OEGR that assist in measuring each construct. The present task was accomplished first by means of conducting a thorough literature review during which the factors were elicited (Chapter 2), and analysing the interview answers of respondents of phase one of this research (Chapter 4). The interviews with ICT professionals and specialists concerned with e-Government in Saudi Arabia showed which aspects were significant for presence of each of the identified factors, such as, for instance, support processes, process automation, and data and information flow for the factor of "Processes", and leadership, action plan, and development plans for the factor of "Strategy". The second objective was to identify internal factors that affect the formation of OEGR in the public sector organizations. This task was also accomplished by means of gathering initial information through literature review and analysis, and then through verifying those initial suppositions by means of qualitative interview analysis.

The third objective of this study was to determine the role of strategy in the formation of the OEGR and its impact on other factors included into the proposed OEGR assessment model. The present objective was successfully attained by means of an in-depth analysis of interviews, which helped refine the conceptual model suggested in this thesis. The supposition about the overarching impact of the strategy factor on all other OEGR-shaping factors was later verified statistically in the quantitative analysis portion of this study, which made the objective fully accomplished and the role of strategy – proven.

The fourth objective of this study was to develop a suitable research methodology for empirical research of governmental organizations in Saudi Arabia in the form of an e-Government framework to assess OEGR in public sector organizations in Saudi Arabia. The present methodology was fully formulated at the end of chapter 5, quantitative analysis of the model's relationships, with all factors except for the user access proving to have a direct and undisputed impact on the OEGR of public sector

organizations. The model is generally fit for the analysis of both developing and developed countries' OEGR, with some specific items fitting the individual context of Saudi Arabia added in chapter 6, discussion of results.

The fifth objective of this thesis was to carry out the empirical qualitative and quantitative assessment of the OEGR measurement model factors' propriety and strength of links. This objective was accomplished in chapters 4 and 5, first by conducting an in-depth interview analysis to verify the relevance of all seven elicited factors affecting the OEGR. The final stage of this objective's accomplishment was completed in chapter 5, when all links were statistically tested and proven, giving a resulting model with strategy as a meta-factor affecting the five factors of portals, ICT infrastructure, human resources, e-government programs, and processes.

Finally, the sixth objective of this order was to propose an integrated model for assessing organizational readiness of e-Government specifically for developing countries' public sector organizations. The present task was accomplished in chapters 5 and 6 of this thesis. Chapter 5 yielded a final version of the model in which the meta-role of strategy was acknowledged, and a poor association between OEGR and user access was identified. Therefore, the final version of the model was presented, with proper regard to the newly established strength and nature of relationships between concepts. In chapter 6, some specific features of the Saudi Arabian context of e-Government services' integration were added to make the model specifically suited to the Saudi Arabian realities of OEGR establishment.

7.4 Answering the Research Question

In order to achieve the research objectives a research question was developed. The question posed at the beginning of the thesis was:

> ***What are the key factors influencing organisational e-Government readiness (OEGR) within the Public sector in Saudi Arabia?***

The model shown in Figure 6-1 answers this question. As illustrated, there are a number of factors in each of the seven constructs to measure their effect on OEGR. The model emphasised the effect of these constructs on OEGR, and emphasised the effect of strategy on the other six constructs. Quantitative analysis of the data presented information about which factors had the highest weights in each construct.

Unfortunately, the impact of the User Access factor was too weak to be included into the final model for OEGR assessment, which makes it a redundant component of the model, and yields a model of the following structure: the strategy of a governmental agency for OEGR implementation produces an overarching, meta-impact on the five factors of ICT infrastructure, processes, human resources, portals, and e-Government programs, while those five factors and again the strategy factor produce their varied but proven impact on the OEGR of that agency.

The major benefit of this study is that the integrated model developed by means of conducting this multi-stage research is suitable not only for Saudi Arabia (though it considers its public sector's e-Readiness specifics), but also for many other developing countries struggling on the way to achieve a higher level of OEGR. The general model formulated in chapters 2 and 5 is applicable to both developed and developing countries, but the integrated model formulated in chapter 6 is more suitable for developing countries experiencing some specific problems such as a lack of qualified staff, geographical disparities in the ICT infrastructure, software, and hardware provision, and an absence of commitment and motivation towards OEGR achievement. Therefore, this model may be used by both researchers (in their applied research assessing real-life public sector organizations) and by officials (to aid their decision-making processes and improve OEGR by identifying and eliminating the organization's weaknesses and gaps in relation to e-Readiness).

7.5 Summary of Thesis Findings

E-Government promises a host of benefits such as improved transparency, convenience, stakeholder relationships, and cost efficiencies. This has moved government organisations toward allocating significant resources for its development. Yet e-Government projects cannot be implemented without understanding the context in which e-Government manages. As a result, it is essential to carry out research to assess OEGR.

The literature reviewed in this study revealed that only a few studies pay attention to a comprehensive assessment of OEGR in Saudi Arabia. The reason behind focusing on governmental Web sites is the ease in evaluating them. The literature revealed that researchers primarily use basic criteria to measure Web sites. Therefore, top management is persuaded to concentrate on front office services such as a Web site

as it satisfies stakeholders and survey institutes. Without having a proficient back office, organisations will not be able to offer e-Services. In addition, the literature revealed an obvious gap in investigating OEGR at an organisation level.

The study reviewed previous literature to drive the research into the context of approaches already accomplished. Consequently, the study ensured objectivity via building the hypotheses from related literature in IS and e-Commerce, e-Readiness, and e-Government success models. A proposed model was developed comprising the effects of seven constructs. The effect of strategy on these constructs was investigated. The qualitative findings confirmed the significance of each construct in affecting OEGR and the relationships between strategy and the other six constructs. Quantitative findings revealed that strategy, Yesser, portal, processes, ICT infrastructure, and human resources had a positive impact on OEGR. There was no direct link between user access and OEGR. This highlights the need for further investigation to promote e-Government within each public organisation, and to set a complete e-Government user access encompassing all the components highlighted in the model. This should be considered in work that may be conducted in Saudi Arabia.

The results highlighted the significance of leadership in an e-Government strategy to ensure top management support and advance e-Government use in diverse areas in public sector organisations. Findings revealed that one of the main factors that delay the transformation to e-Government in Saudi Arabia is the lack of integration of ICT and business processes between public organisations and Yesser. Finally, the study revealed that a lack of qualified employees is a main factor delaying OEGR in Saudi Arabia.

7.6 Theoretical Implications of Thesis Findings

Primarily, the research makes a significant theoretical contribution as it developed a comprehensive model for assessing organizational e-government readiness in the public sector. Indeed, this model offers valuable insight into OEGR measurement, particularly on a micro level. The results support prior research that reveals the relationship between organisational factors and discovers the role of an e-Government readiness characteristic in an organisation’s context that can be put into practice. The research contributes to back office effectiveness. Overall, the

research assists decision makers in the public sector to employ assessment of OEGR. Finally, the research provides a systematic approach for e-Government adoption and transformation by highlight the role of strategic style in OEGR. It resonates with earlier studies that strategy is an important construct of OEGR in developing countries, including Saudi Arabia.

The findings and approach of this study have increased the existing body of knowledge in the area of information systems and e-Commerce in general, and in e-Readiness and e-Government readiness in particular, addressing the gap identified by Al-NUaim (2011), Andersen and Henriksen (2005), Cohen (2004), Grounlund (2005), Kahen (1996), and others. As it was noted earlier in this dissertation, such researchers as Hood (1998), Kraemer and King (2006), Norris and Lloyd (2006), among others, claimed the need for establishing a firmer link between organizational strategy, user access, e-Government, implementation process, and information systems, as well as other OEGR components identified in prior research. This task was finally accomplished both qualitatively and statistically in this dissertation, and the SEM technique of quantitative data analysis even enabled the researcher to quantify the strength of relationships between each of the model's components.

As a result of this extensive work, the empirical model, which resulted from accurate assessment and validation, can be used as a framework for organisations planning to adopt an appropriate environment for an e-Government project. The model provides many implications that could help advance strategies to improve e-Government diffusion and transformation. First, it enables and simplified further research on e-Government in Saudi Arabia, which is an urgent need of the modern Saudi scholarly community, as noted by Alshehri and Drew (2010) and Azab et al. (2010). This model is a ready-made, statistically validated tool that can be taken as a quick inventory for data collection and analysis on any public sector organization in Saudi Arabia. Moreover, its standardized form creates a possibility for effective and information-rich inter-organizational comparisons, thus increasing the overall understanding of the current progress and future directions of building OEGR in Saudi Arabia.

7.7 Practical Implications of Thesis Findings

E-Government may be a strange and unclear initiative in Saudi Arabia, especially taking into account the conservative Saudi culture and ICT backwardness, both in technological provision and in people's digital literacy, in certain geographical regions of the country (Abdalla, 2006). Nevertheless, the pace of change is quick in the 21st century, and achievement of OEGR in the Saudi public sector has become a vital necessity of modernity. Introduction of effective e-Government in Saudi Arabia promises to simplify the process of information exchange, service provision, and information flow among countless stakeholders of the public sector organizations. Moreover, OEGR is important as it will help overcome resistance to change and improve e-Government transformation.

The study results revealed a number of areas where changes could be made. Quantitative analysis revealed that the factor most affecting strategy is leadership, which takes into account all Internet services as one of the key visions of e-Government. Other important factors are identification of challenges, objectives, and presidential support. Quantitative findings considered the existence of an action plan (stakeholders' role and timeframe) and future development plans (delivery channels, integrity, ICT architecture, structure plan) as the main factors affecting the strategy construct. Qualitative analysis revealed that the lack of e-Government strategy in organisations led to the weak co-ordination between ICT management at different levels of responsibility. Qualitative analysis confirmed that user access channels are necessary to provide e-Services to citizens, other government organisations and employees. E-Government applications in Saudi Arabia must also consider the integration with organisations to have compatibility. It should provide and guarantee continuous support from Yesser because it is the main factor in its success. Quantitative findings also considered the availability of a GSN and GSB with responsibility to co-ordinate them with other public organisation as the most important factors in the Yesser construct.

Following the call of Accenture (2007) and Azab et al. (2009) to improve the back office effectiveness of e-Government services, the present study has uncovered many technically specific aspects important for achieving OEGR. Concerning Web site availability, usability, layout, navigation and consistency, information and existence

of SSO, compatibility has the highest weight. For the layered structure operating systems, software and connectivity are the most important factors. SOA transactions and compatibility between ICT systems were also found essential, helping an organisation integrate applications and reduce different types of applications, databases, and platforms.

Quantitative analysis revealed that performing regular assessment of stakeholders' feedback and determining accuracy and streamlining of business processes have a high effect. Selecting the proper ICT applications will improve the development of OEGR in Saudi Arabia. Hence, in the light of these findings, the practical implication this dissertation offers for public sector organizations is to apply extra effort to implement BPR, and to explore means to change ineffective business processes by considering the cultural and bureaucratic challenges that delay this transformation.

The main factors for ICT infrastructure are accessibility, usefulness, compatibility between departments and other agencies, and standards of hardware and software systems. These findings suggest that in practice, more effort should be directed towards improving the communication between the ICT support staff and employees to notify employees of scheduled system downtime, and of the status of continuing projects. E-Government initiatives should be taken to improve the PCs and VOIP. Improvement in ICT quality should also be taken into account as well as determining ways to persuade employees to use ICT by offering extra training and support. In addition, encouragement to use facilities such as Intranet and e-Mail must be supported since it improves chances for growth.

The awareness of e-Government by employees and the impact on performance and flexibility are key factors in the human resources construct, which requires reviewing the suitability of the training to the needs and responsibilities of employees. Another issue to consider is organisation characteristics such as support for the OEGR implementation, motivation to learn from best practices of other countries and other organizations, incentives to increase digital literacy skills, etc. The advantage of OEGR is that it can be copied; nevertheless, its implementation by other organisations is complex due to each organisation having its own characteristic (Miia

et al., 2006). Thus, one approach is for the organisation to adjust the e-Government project to fit internal factors (Bodas Freitas, 2008; Koskela and Vrijhoef, 2000).

This study produces significant approaches for decision makers in this field. By taking into account opinions of top management and ICT specialists about e-Government projects at their organisations, this study offers insights and an approach to policy makers who need to evaluate OEGR. In addition, it has revealed the significance of an in-depth organisational e-Government strategy covering several factors as detailed in the developed model. Consideration of such a strategy in any government organisation was confirmed to be significant. Leaders should produce strategy awareness in each public organisation. The strategy should have clear action plans. Methods are required to implement diverse delivery channels to accept citizens, other government departments, private firms and employees accessing e-Services.

The gap between ICT in Saudi Arabia and advanced countries is considerable. Therefore, the Saudi government should provide Yesser with power, skilled human resources, awareness, legislation and sufficient funds for development. This will enhance organisations' participation, along with e-Readiness productivity and the entire country's e-Government project. Co-ordination is necessary within the public sector to ensure compatibility in connecting to the GSN and GSB. Individual public organisations should be involved in early preparation of e-Government strategy plans. Table 7-1 presents a summary of managerial implications arising from this study.

Table 7-1: Summary of managerial implications

Key Factor	Managerial Implications
Strategy	Leaders should create awareness of the strategy in each government organisation. Steps should be taken to ensure that the strategy has clear plans.
User access	Mechanisms are needed to implement different delivery channels to allow multiple stakeholders including citizens, other government departments, private firms and employees to access e-Services.

Key Factor	Managerial Implications
Yesser	Re-engineer Yesser with proficient human resources of development system, awareness, legislation and sufficient funds for development plans. Co-ordination is essential with government organisations to ensure compatibility in connecting to GSN and GSB. Respective government organisations should be involved in early phases of government sector strategy plans.
Portal	Integrating Web site portal activities with internal processes should be among the top priorities in any e-Government strategy. The portal should be service oriented with available and well-structured services to ensure effective access to stakeholders.
Processes	Emphasis should be placed on digitising information to improve data management. Business processes should also be re-engineered to automate work processes.
ICT infrastructure	Policy makers should aware that despite the many plans to enhance the country's ICT infrastructure, this study revealed that it is still deficient in rural areas. Also integration between organisations and branches is not satisfactory which has affected OEGR. Therefore, a focus on connectivity is essential.
Human resources	Involving employees throughout the different stages of consultation should be encouraged to leverage their experience and foster commitment to initiative and less resistance to change. More technical help and training should be provided to employees to increase OEGR. It's essential to reassess promotion, motivations and salaries of their professions in order to attract them to managerial positions.

7.8 Strengths and Limitations of the Research

The present study has both strengths and limitations that have to be considered when assessing the validity, reliability, and the overall scholarly value of this study. The first essential strength of this study is its sources. The model was derived from a set of constructs and characteristics different from preceding thorough and detailed conceptual and empirical research. Another strength of the study is its novelty, since the implemented operationalization of measurements for some of the OEGR constructs applied in this study is new to the literature. Empirical research in Saudi Arabia was developed through a widespread process of literature review, interviews, observation, and pre-test questionnaire. Therefore, the present study expands the already-existing modes of empirical research by means of designing a two-phase research endeavour and covering both qualitative and quantitative samples of data.

It is also necessary to keep in mind the particular strength of this study in the covered different organisation types and sizes. Since the study aimed at reaching

representatives of the public sector institutions in Saudi Arabia, covering more than 50 institutions in a nationwide sample seems a very strong start of the research in the defined field. In addition, the study involved several levels of participants such as CIO, e-Government committee members, and ICT development managers, thus minimising bias and ensuring the comprehensiveness of obtained data. Receiving objective qualitative accounts of the progress towards OEGR in the public sector organization would be impossible in case respondents of different levels were not involved.

To improve the exploratory and confirmatory power of the model, a SEM data analysis was conducted to identify and confirm the most significant factors within each model construct to ensure the relation between them and the factors. Moreover, data triangulation from phases one and two of the study is also a significant strength of this thesis, mainly because there is much criticism of both qualitative and quantitative research methods when applied separately. Thus, a present study combining qualitative and quantitative inquiry methods in a single research effort enables cross-checking of data and the creation of a strong basis for inferences verified both statistically and by interview analysis.

However, in line with certain strengths, this study also possesses certain limitations that need to be addressed. The main limitation is the small sample size from each organisation. This was beyond the control of the researcher since this study focused on top management and specialists, a comparatively small group in Saudi Arabian government. Moreover, a limitation of the sample is a relatively low response rate which hardly reached 50% of respondents. However, the qualitative sample of 14 respondents was sufficient for a qualitative inquiry, and triangulation of qualitative and quantitative data increased the validity of obtained findings.

Another limitation is the possibility that participant feedback might be biased to avoid criticism. It is part of Saudi Arabian culture that employees are unwilling to give negative responses to surveys, particularly about their work environment, even when they are aware of the anonymity of their responses. Secondly, participants had different levels of knowledge and experience. Also, the questionnaire's length could have resulted in some participants not answering such a large number of questions. In some cases confidentiality or bureaucratic reasons eliminated data obtained from

interviews. Finally, the limitation of this study may be the fact that OEGR's quantitative model may fail to uncover certain institution-specific features, and a small set of open-ended qualitative questions should be added to the model to show what specifics of OEGR each institution has.

To overcome these limitations, the researcher provided the interviewees with the research outline and advantages of the research at both organization and country level at least five days before the interview. The researcher also supplied official documents that guarantee confidentiality of information to the potential respondents. Moreover, meetings with respondents for face-to-face interviews were conducted in secure private places to avoid the confidentiality breaches.

7.9 Future Research Directions

Though this study has provided a range of feasible empirical findings in terms of OEGR assessment, it is necessary to recognize that this study is still a pioneering endeavour in this field, and further research has to be conducted to validate the present thesis's findings. As noted by Alghamdi et al. (2011) who conducted a similar study, the present study only paves the way for future quantitative empirical research for framework's testing and development. In line with this study's essential role of a significant conceptual step in the identification of relevant factors from an organizational perspective in terms of ICT-specific OEGR assessment, it is only the first study of such a kind, and more empirical tests for the model are required in the near future for ensuring and guaranteeing its validity in the long run.

The present model is the first step in standardized, empirical assessment of OEGR in Saudi Arabia. Thus, for the increase of its validity and reliability, it would be useful to conduct a longitudinal evaluation study on the same country. Such an assessment should be funded by the government whose prime interest should be in increasing OEGR, identifying barriers to it, and finding out the effectiveness of interventions and campaigns directed at increasing OEGR in the public sector organization. Hence, about 5 years of duration (or even more) would suffice for such a model to be empirically tested and for it to bring feasible value by informing decision-making and improving the policies directed at OEGR. The ability to carry out periodic evaluations would offer important insights into the progress of e-Government, and

would highlight its transformation over time. It would then be easier to guide e-Government's path in public organisations.

Further research is necessary for identifying the model's applicability in a variety of contexts. Indeed, the public sector of Saudi Arabia is diverse, and different types of organizations may measure and treat their OEGR in different ways. Therefore, such different studies would definitely help generalise the research findings to create a generic OEGR assessment model that could be applied to any work environment. This would be achieved by carrying out the same study in other countries to test the developed model. In addition, future research could adopt the developed model to conduct a comparative analysis of countries working in similar circumstances, particularly in the Arab and Muslim world, to observe if a comparable finding can be accomplished.

The study was limited to organisational and technological issues at the country level and the organisational context for e-Government at the organisational level in Saudi Arabia. Additional research should investigate the effect of Islamic law on other matters, such as organisation culture and leadership style. As claimed by Al-Omari and Al-Omari (2006), the legal context in which the transition to e-Government takes place is crucial in determining its outcomes and extent of success. Therefore, it is essential to conduct future studies to integrate the model into the legal context of Saudi Arabia and check for compliance. Many interviewees claimed that legal structures of the Saudi Arabia at present do not favour the e-transition, which implies the need for a wider legal and policy change to foster higher OEGR. Thus, such research findings would advance insights into such matters on organisational e-Government readiness and identify what factors are related to it.

Though the present study's quantitative analysis failed to identify the link between OEGR and user access qualitative accounts repeatedly stated that the relationship of these components of the model is close and direct. The reason for which the model failed to detect that connection may be found in the small sample of the study; hence, to identify that link or to verify its absence, this study should be replicated with different data samples and respondent samples. Using the same method with a distinct data set is likely to provide highly valuable, objective, and statistically precise outcomes that will show whether there is any impact that user access may

exert on the OEGR level in public sector organizations in Saudi Arabia. Moreover, future studies using the same research method may add other e-Government characteristics from the diffusion of e-Government theory, such as citizens' readiness, to explore possible relationships among them and discover which characteristics affect the implementation of e-Government.

Finally, it is suggested that further research be carried out at the micro level of e-Government. This is often ignored, particularly in developing countries. It is essential to consider the opinion of the employees in the organisations under exploration. Here, the cultural perspective may become an efficient variable of the model, in terms of the impact of the national Saudi culture on the proneness to adopt e-Government initiatives and the development of ICT skills. The cultural perspective may also be taken from the organizational culture point of view, distinguishing the organizational cultures of public and private sector entities (Kovacic, 2005). The present ideas were also proven by Rahman (2010) who proved in his research study that different OEGR levels in different countries are partly explained by the difference in national and organizational culture affecting the adoption of, and transition to, e-services of the government. Such future research studies are potentially valuable in terms of individualizing the OEGR model and making it specifically suited to the Saudi Arabian public sector context.

7.10 Summary

This research was conducted to fulfil the need for more empirical studies on the characteristics associated with OEGR in Saudi Arabia, particularly from a public sector perspective. The findings of this study provide a resource for those researchers seeking to enquire further into OEGR, as well as provide important approaches into the operational environment of Saudi Arabian government organisations. By highlighting the key factors in each construct, policy makers can assign them their appropriate priorities. The model and recommendations drawn from this thesis could facilitate greater awareness of previously unconsidered issues when planning new e-Government projects. This could promote the value of and acceptance by those affected by those decisions, and provides opportunities in understanding the main factors to assist in achieving success of these projects.

To achieve the aims of the study, the researcher developed a research model comprising seven constructs, namely: 1) strategy; 2) user access; 3) Yesser; 4) portal; 5) processes; 6) ICT infrastructure; and 7) human resources. There were a number of factors or measuring constructs under each dimension. The research model and hypotheses were assessed using a series of quantitative techniques, specifically, exploratory factor analysis, confirmatory factor analysis, and structural equation modelling. These techniques were conducted on data obtained from a questionnaire survey of 50 Saudi Arabian government organisations.

The study offers an insight into OEGR, particularly on a micro level. Such a perspective of e-Government has been hitherto ignored in the literature. Moreover, the study did not rely solely on the literature in developing an OEGR model, but conducted an empirical research to improve understanding its context. Applying in-depth exploration and examination of government organisations in a developing country is also a significant contribution, because few studies have covered OEGR. Thus, the findings of this study have enlarged the existing body of knowledge in the area of e-Readiness and e-Government readiness specifically, and information systems and e-Commerce generally.

The study provides recommendations for organisations and decision makers. The results revealed the significance of leadership in an e-Government strategy to advance OEGR. The lack of integration of ICT and business processes between government organisations, and between Yesser and public organisations, revealed one of the main factors that delay the transformation to e-Government in Saudi Arabia. The study revealed that one of these delaying factors is the lack of qualified employees in the Saudi government sector.

Indeed, this study makes an important contribution of a model for assessing organizational e-Government readiness in the public sector in Saudi Arabia.

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Appendices

Dr. Robert Goodwin
Senior Lecturer in School of Computer Science, Engineering and Mathematics
Room (358), Information Science & Technology Building

GPO Box 2100
Adelaide SA 5001

Tel: (+61 8) 8201 3113
Fax: (+61 8) 8201 2904
Email: Robert.goodwin@flinders.edu.au
http://csem.flinders.edu.au/
CRICOS Provider No. 00114A

Appendix 1: **INFORMATION SHEET** (Interview)

Title: 'E-Government Framework for Assessing Organisational E-Readiness in Developing Countries: A Case Study of Saudi Arabia'

Investigators:

Mr Ibrahim Alghamdi
School of Computer Science, Engineering and Mathematics
Flinders University, Australia
Ph: (+61 8) 8201 3113
Email: algh0044@flinders.edu.au

Description of the study:

This study is part of the project entitled 'E-Government Framework for Assessing Organisational E-Readiness in Developing Countries: A Case Study of Saudi Arabia'. This project will investigate organisational and technological requirements that will be necessary for the e-Readiness to resolve the delay of e-Government in public sector organisations. This project is supported by Flinders University School of Computer Science, Engineering and Mathematics department.

Purpose of the study:

This project aims to define organisational and technological requirements that will be necessary for the e-Readiness to resolve the delay of e-Government in public sector organisations in developing countries and particularly in Saudi Arabia. This aim will be achieved in this study through developing an integrated e-Government framework for assessing the e-Readiness of government public sectors. This study will attempt to answer the question: What are the main internal factors in the assessment of e-Government organisational e-Readiness in developing countries and particularly in Saudi Arabia and how do they lead to successful organisational e-Government readiness?

What will I be asked to do?

You are invited to attend a one-on-one interview with a PhD student who will ask you a few questions the main internal factors in the assessment of e-Government organisational e-Readiness in developing countries and particularly in Saudi Arabia and how do they lead to successful organisational e-Government readiness. The interview will take about one hour. The interview will be recorded using a digital voice recorder to help with looking at the results. Once recorded, the interview will be transcribed (typed-up) and

stored as a computer file and then destroyed once the results have been finalised. This is voluntary.

What benefit will I gain from being involved in this study?
The sharing of your experiences will improve the planning and delivery of future programs. We are very keen to deliver a service and resources which are as useful as possible to people. The results of the study will help all government organisations to assess their e-Government readiness by using the suggested framework and help the top manager and IT directors/managers to cover the limitations.

Will I be identifiable by being involved in this study?
We do not need your name and you will be anonymous. Once the interview has been typed-up and saved as a file, the voice file will then be destroyed. Any identifying information will be removed and the typed-up file stored on a password protected computer that only the Investigator (Mr Ibrahim Alghamdi) will have access to. Your comments will not be linked directly to you.

Are there any risks or discomforts if I am involved?
Other group members may be able to identify your contributions even though they will not be directly attributed to you.
The investigator anticipates few risks from your involvement in this study. If you have any concerns regarding anticipated or actual risks or discomforts, please raise them with the investigator.

How do I agree to participate?
Participation is voluntary. You may answer 'no comment' or refuse to answer any questions and you are free to withdraw at any time without effect or consequences. A consent form accompanies this information sheet. If you agree to participate please read and sign the form.

How will I receive feedback?
Outcomes from the project will be summarised and given to you by the investigator if you would like to see them.

Thank you for taking the time to read this information sheet and we hope that you will accept our invitation to be involved.

School of Computer Science, Engineering and Mathematics - University of Flinders, Australia*This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number :* **5338***). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on (+61 8) 8201 3116, by fax on (+61 8) 8201 2035 or by email human.researchethics@flinders.edu.au.*

Dr. Robert Goodwin
Senior Lecturer in School of Computer Science, Engineering and Mathematics
Room (358), Information Science & Technology Building

GPO Box 2100
Adelaide SA 5001

Tel: (+61 8) 8201 3113
Fax: (+61 8) 8201 2904
Email: Robert.goodwin@flinders.edu.au
http://csem.flinders.edu.au/
CRICOS Provider No. 00114A

Appendix 2

CONSENT FORM FOR PARTICIPATION IN RESEARCH

(by interview)

I .....

being over the age of 18 years hereby consent to participate as requested in the Letter of Introduction for the research project on E-Government Framework for Assessing Organisational E-Readiness in Developing Countries: A Case Study of Saudi Arabia.

1. I have read the information provided.
2. Details of procedures and any risks have been explained to my satisfaction.
3. I agree to audio recording of my information and participation.
4. I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
5. I understand that:
   - I may not directly benefit from taking part in this research.
   - I am free to withdraw from the project at any time and am free to decline to answer particular questions.
   - While the information gained in this study will be published as explained, I will not be identified, and individual information will remain confidential.
   - I may ask that the recording be stopped at any time, and that I may withdraw at any time from the session or the research without disadvantage.
6. I have had the opportunity to discuss taking part in this research with a family member or friend.

Participant's signature……Date……...

I certify that I have explained the study to the volunteer and consider that she/he understands what is involved and freely consents to participation.

Researcher's name…….……..

Researcher's signature……..Date…….

NB: Two signed copies should be obtained. The copy retained by the researcher may then be used for authorisation of Items 8 and 9, as appropriate.

Dr. Robert Goodwin
Senior Lecturer in School of Computer Science, Engineering and Mathematics
Room (358), Information Science & Technology Building
GPO Box 2100
Adelaide SA 5001
Tel: (+61 8) 8201 3113
Fax: (+61 8) 8201 2904
Email: Robert.goodwin@flinders.edu.au
http://csem.flinders.edu.au/

Appendix 3: LETTER OF INTRODUCTION (Interview)

Dear Sir/Madam,

This letter is to introduce **Mr. Ibrahim Alghamdi** who is a government official in the Real Estate Development Fund in Saudi Arabia and currently a PhD student in the School of Computer Science, Engineering and Mathematics at Flinders University in Australia.

He is undertaking research leading to the production of a thesis or other publications on the subject of "E-Government Framework for Assessing Organisational E-Readiness in Developing Countries: A Case Study of Saudi Arabia".
He would be most grateful if you would volunteer to assist in this project, by allowing him to meet you to complete this interview questions which covers certain aspects of this topic. This interview aims to investigate organisational and technological requirements that will be necessary for the adoption of e-Government to resolve the delay of e-Readiness in public sector organisations.

If you are interested you will be requested to answer a 5 pages interview questions. This interview will not take more than one hour of your time to complete it. A summary of the results will be sent by email to interested respondents.

Be assured that any information provided will be treated in the strictest confidence and none of the participants will be individually identifiable in the resulting thesis, report or other publications. You are, of course, entirely free to discontinue your participation at any time or to decline to answer particular questions.
Any enquiries you may have concerning this project should be directed to me at the address given above or by telephone on (+61 8) 8201 3113, by fax on (+61 8) 8201 2904 or by email to (Robert.goodwin@flinders.edu.au).
Thank you for your attention and assistance.

Yours sincerely
Dr. Robert Goodwin
Senior Lecturer

School of Computer Science, Engineering and Mathematics - University of Flinders, Australia *This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number : **5338**). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on (+61 8) 8201 3116, by fax on (+61 8) 8201 2035 or by email human.researchethics@flinders.edu.au.*

Appendix 4: Questions to Officials from the Government Sector

Your details

Name: .....

Position: .....

Experience (year): .....

Organisation: .....

Organisation's website: .....

Tel./Fax.: .....

Mobile: .....

Email: .....

City: .....

Basic Information:

s.	Item	Answer
1	How many employees in your organisation?	
2	How many Government to Citizens (G2C) e-Services does your organisation offer?	
3	How many Government to Government (G2G) e-Services does your organisation offer?	
4	How many Government to Business (G2B) e-Services does your organisation offer?	
5	How many Government to Employees (G2E) e-Services does your organisation offer?	
6	How many branches does your organisation have?	

E-Government Organisational Strategy:

1- Does your organisation have an e-Government committee as required by Saudi Council of ministries decision no. 8189/MB in 19-6-1426 H/23-7-2005 G?

2- Does your organisation have a vision or strategy to develop e-Government Initiatives in the near or distant future? If yes, what? If no, why?

3- Are there Effective legislation and law(s) pertaining to e-Government established in Saudi Arabia to govern electronic (online) activities? If yes, please clarify. If not, how would you deal with any adverse electronic (online) incidents?

4- Does your organisation have an action plan (work plan/operation) based on the ICT strategy to transform to e-Government services for implementing suggested projects and measure their performance?

5- Does your organisation have a steering committee to follow up the e-Government ICT strategy? If yes, How? If no, why?

6- Does your organisation have a future development plan to follow up the e-Government ICT strategy? If yes, How? If no, why?

7- Is the e-Government strategy aligned with the organisation's business strategy?

8. Were your organisation have a dedicated budget for e-Government strategy?

9. Does your change management department/section activities with the users well coordinated and affective?

10. How are resources allocated to, or within, the organisation for the development of e-Government?

11- Does your organisation announce new e-Services? If yes, How? If no, why?

User Access:

1- Does your organisation offer G2C, G2B, G2G, and G2E e-Services? Which ones? If no, why?

2- What are your e-Services delivery channels?

3- Is there a mechanism by which the public can provide feedback on online services and influence the continued development of the Agency's e-Government offering?

4. Are citizens able to access online documents related to issues currently being decided? If yes, provide examples with URL.

5. Are citizens able to communicate electronically with the Agency's documents' cycle and officials? If yes, provide examples with URL.

E-Government Program "Yesser":

1- What is your assessment and opinion of the national e-Government program named "Yesser"?

2- Does your organisation exchange information with "Yesser" and/or any other government or private agencies?

3- Does your organisation offer e-Services via the e-Government program "Yesser" portal? If yes, what is the proportion of total services?

ICT Architecture (website):

1- Does your organisation offer e-Services via your website portal? If yes, what is the proportion of total services?

2- Do you see the availability and accessibility of e-Government transactions as a barrier to any new ICT project in your organisation?

3- In general, describe what best characterizes the provision of the organisation's government e-Services:

A	No electronic services.	
B	Only information available on the website.	
C	One way interaction possible.	
D	Two-way interaction possible.	
E	Complete transaction possible within single agency.	
F	Complete transaction across multiple agencies.	

4- In general, how do you see the quality of your website regarding the availability, accessibility, content, e-Services, update, and connection speed?

Processes

1- Does your organisation use specific tools (Ex. Business Processes Re-engineering (BPR)) to re-engineer, manage, and improve the organisation procedures to match users requirements? If yes, what? If no, why?

2- What major ICT applications project(s) have you implemented in your organisation? Ex. Core business, ERP.

3- Please rate the organisation's average internal capacity to pursue the following information management activities:

Information Activity		Very Poor						Very High
A	Produce information.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	Gather information.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C	Digitize Information.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
D	Process information.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
E	Analyze information .	**1**	**2**	**3**	**4**	**5**	**6**	**7**
F	Distribute information.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
G	Give public access to information.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
H	Archive information.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

ICT Infrastructure:

1- A lack of ICT infrastructure is one of the major barriers to the growth of government organisations' capabilities to provide e-Services and transactions. Do you see this as a barrier to transform e-Government in your organisation?

2- What major ICT infrastructure project(s) have you implemented recently in your organisation?

3- Is there intranet connectivity and digital interaction between the central and local governments?

4- Does your organisation have an ICT security solution and policy?

5- Does your ICT department have day to day work plan?

6- Does your organisation have e-Services help desk working 24/7?

7- Please rate the organisation's average internal capacity to pursue the following:

IT Infrastructure		Very Poor						Very High
A	Quality of software applications.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	Quality of connectivity (WAN & LAN.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C	Quality of ICT security.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
D	Quality of hardware.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
E	Quality of technical support							

Human Resources:

1- Does your organisation have enough qualified ICT staff? Do you see this as a barrier to any new ICT project in your organisation?

2- Do you consider that only employees with good education and awareness about ICT skills will be using any IT systems as a barrier to any new ICT project in your organisation?

3- What is the level of awareness of the benefits of e-Government in the organisation in the following group?

		Very Poor Awareness						Very High Awareness
A	Policy makers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	Senior managers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C	Middle managers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
D	End users.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

4- How do you plan to deal with computer-illiterate employees? What is their option in this case?

5- Do you believe education and training are the sole solutions for the uptake of any system particularly in your organisation and Saudi Arabia? If yes, how? If no, why? What other solutions are planned?

6- Was a Service Management department with end-to-end responsibility for service delivery was identified?

7- Was a Service Level agreement such as customer service satisfaction implemented?

8- Was ICT Assistance, such as a help desk, provided to that meet customer needs?

E-Government Overview:

1- How do you see e-Government's potential for your organisation?

2- What is your assessment of the progress of e-Government readiness particularly in your organisation and in Saudi Arabia?

3- In your opinion, what are the major barriers you expect to affect the e-Readiness of government organisation in Saudi Arabia?

And what are the solutions that might be adopted in this case?

4- Why is it that some government organisations are more ready than others in the adoption and diffusion of e-Government in Saudi Arabia?

5- What is your assessment of what has been done so far in the area of e-Government particularly in your organisation and Saudi Arabia ? Are we moving slowly? Why is that?

6- Where do you see this organisation and e-Government readiness in Saudi Arabia 5 years from now?

7- Do you think the e-Government initiative and projects budget can be a major obstacle to transform to e-Government? If yes, how do you think it can be solved?

8- What barriers have you faced or you expect to face in the implementation / uptake of any ICT project you have undertaken?

9- Do you see ICT project management as a barrier to any new ICT project in your organisation?

10- Please rank the following factors in terms of their importance on e-Government readiness in the organisation:

	Strategy
	User Access
	The Agency participate in the national e-Government portal "Yesser"
	ICT Architecture (Organisation's Website)
	Processes
	ICT Infrastructure
	Human Resources

Appendix 5: Interviews

Interview One

Interviewee: Chief Information Officer (CIO)

Strategy: An e-Government committee has been created for the head office in Riyadh and the two industrial cities in Jubail and Yanbu as required by Saudi Council of ministries decision. The organisation's vision is plan, promote, develop and manage petrochemicals and energy intensive industrial cities through successful customer focus and partnerships with investors, employees, communities and other stakeholders. *"The aim of e-Government strategy (cooperate and ICT) is to find the key motives that guide to the implementation of e-Government at the sector were to fight corruption and bureaucracy by providing a separation between investors requesting services from the region and employees delivering them.*". In addition, the organisation aimed to facilitate service delivery for investors by saving time, money, and effort. *"The action plan was part of the national e-Government strategy and for modernising the public sector through the utilize of ICT. Strategy was predictable to play an important role in providing additional control and accountability on employees and stakeholders.".*

"The e-Government future plan strategy is important to re-Engineer business processes in each department to ease services offered and to avoid any duplication of work, thus reforming them over all departments. The next step is to apply sufficient policies, ICT infrastructure, selecting right people, designing attractive portal and providing different access channels to ensure the implementation of the e-Government project all over the sector."

The organisation has dedicated fund for e-Government plans which provided from Ministry of Finance. There is no change management because of implementation of collaborates strategy. New e-Services only announces via the organisation website.

User access: *"All e-Services offer on the website, mobile and through "SADAD" (BPAY, ATMs, telephone).*" The organisation offers around twenty G2B services in serving investors and to improve the quality of services such as investors, and

contractors' services. The organisation offers around forty G2E e-Services via ERP and other applications. G2C e-Services around ten such as applying for approval to practices careers, query about lands. The organisation offers about five G2G e-Services such as payment through "SADAD" system includes ATMs, BPAY and telephone. Clearly, organisations which do not offer appropriate e-Services and multi delivery channels have difficulties in dealing with their stakeholders eventually have low e-Government readiness. For instance, long queues of people waiting to complete their procedures. All the public can provide feedback on online services but the participation is low. Users are not able to access documents online only can access announcement.

"Yesser": The e-Government national program "Yesser" has plans and sufficient fund from the government. *"There is a delay in implementing their plans because of low ICT infrastructure readiness of many government organisations. Also, there is no exchanging information between* the organisation *and "Yesser" due to lack of coordination from "Yesser" so that affected e-Government services offered negatively.*". The organisation only has some links on Saudi National Portal.

Portal: *"The organisation offers only around %20 of e-Services via the website portal of total services, we hope this percentage increase soon."* The availability and accessibility of e-Government transactions via the portal is not a obstacle for any ICT projects at RCJY. The description of provision of the organisation's government e-Services is one way interaction possible. The quality of the organisation 's website regarding the availability, accessibility, and connection speed is excellent however content, e-Services, and update are not satisfactory.

Business processes: *"The organisation has already applied Business Processes Re-engineering (BPR) when implementing the collaborates strategy and ERP. The main ICT applications projects have been implemented at the organisation are ERP, GIS ECM and core business in order to enhance e-Services offered."* The organisation's average (out of 7) of internal capacity to pursue the following information management activities: Produce information = 6, Gather information = 4, Digitize Information = 5, Process information = 5, Analyze information = 6, Distribute information = 4, Public access to information = 5, and Archive information = 5.

ICT infrastructure: "*ICT infrastructure at the organisation is advanced and up-to-date so that help the organisation to provide e-Services.*" Also, currently the organisation are implementing new projects to develop the ICT infrastructure of the organisation 's Technical Institute, connectivity of fibre optics, developing new ICT infrastructure for a new building, the organisation 's colleges projects and the Internet. The organisation applied ICT security solutions and policies that affective. "*IT operating and maintenance department is important to monitor hardware and software systems and respond to users' needs.*". The organisation's average (out of 7) of internal capacity to pursue the following: Quality of software applications = 4, Quality of connectivity (WAN & LAN) = 5, Quality of ICT security = 6, Quality of hardware = 7, and Quality of technical support = 5.
"ICT Security is very vital for e-Government organisational readiness and should be viewed as a main priority. E-Government systems hold crucial information about the adopting organisation and its clients, and therefore should be protected. Any security breach in such systems would not only damage the organisation's systems, but its image and credibility."

Human resources: Sometimes there are problems with the outsourcing company that provides technical support and staff training, primarily delaying service provision, or offering insufficient training. *"One of the major factors affecting organisation e-Readiness is difficulties in keeping qualified technical IT staff due to the high demand of their expertise in private sectors that offer superior rewarding packages than those provided by the government organisations.". " The organisation offers training courses, and license certificates for all employees need to improve their IT skills.*". *"The organisation created user and technical support department long time ago however users satisfaction department have created recently in Jubail and Yanbu.*". "The policy makers have high level of awareness of the benefits of e-Government however the department and sections managers have less awareness. Also, the awareness of users is low and should be considered to avoid delay in transforming to e-Government.".

As for the priority of the seven dimensions affecting e-Government readiness at the organisation, the most important factor is strategy, followed by human resources,

ICT architecture (portal), "Yesser", ICT infrastructure, processes, and finally user access.

E-Government Overview

Although the organisation produces high quality information, there is still a need to apply further effort to digitise it. Also, the applications that exists at the organisation's requires improvements compared to the quality of the hardware existed. The status of e-Government at the organisation in general is considered in a satisfactory position, and will improve gradually with time. The progress of implementing e-Government in is satisfactory in Saudi Arabia.

The major barrier that affect the e-Readiness of government sector is the high resistance from government organisation against the e-Government initiative in order to resolve this it's important to optimize the goals to achieve satisfactory.

Some government organisations are more ready than others in the adoption and diffusion of e-Government in Saudi Arabia due to four issues:

- Readiness of ICT infrastructure.
- Type of work .
- Business culture.
- Community mid set.

Interview Two

Interviewee: Head of the Internet and E-Services

Strategy: The Mayor Assistant of the area believes that IT impact contributes to the success of the investment sector in Saudi Arabia. The Urban Planning General Directorate is endeavouring, in accordance with the directions of the Mayor, to provide the best service to the citizens in a civilized manner that keep pace with the requirements of the modern time.

"The e-Government strategy and action plan of the organisation are based mostly on providing an additional and easy channel of communication for citizens and other stakeholders by saving time, money, and effort that help also in accessing their relative information and measuring the services *performance*."
Although this strategy is aligned to a large degree with the business strategy of the organisation, there is still opportunity for improvement so that e-Government would be completely supporting, and affecting at the same time, the strategy and objectives of the organisation.

Regarding the resources needed for e-Government implementation, funds do not cause a problem since it is provided from Ministry of Finance aiming to implement and developing e-Government projects. Evaluation of the required funds always takes place based on specific priorities. For the human resources, e-Government tasks are divided into divisions, and every division is accountable for its responsibility to control on performance. *"The ICT department at the organisation adopts a active policy concerning its employees with a goal to select the right staff to implement ICT infrastructure, and to improve the quality of e-Services."*
The action plan implemented by Project Management Office (PMO) which responsible to execute the e-Government projects. *"The e-Services committee formed to monitor and control all e-Government projects."* There is a change control department to help and ease the implementation of new IT projects. New e-Services announces via Municipality website and newspapers.

User access: Around four thousand and three hundred and forty (4,340) employees work at the organisation included all sixty 60 branches. *"The organisation offers around ninety three (93) e-Services as follows via website, ATMs, BPAY, telephone,*

call centre, and sms." Around thirty five (35) G2C e-Services most of them queries such as building certificates, issuing different kind of certificates, following processing etc. Twenty three (23) G2B e-Services all of them provided through "SADAD" that includes ATMs, BPAY and telephone. The organisation offers also around Twenty three (23) G2E e-Services via ERP and training systems. The organisation offers about twelve (12) G2G e-Services also through "SADAD", call centre, sms, email and direct support are available for public to represent their feedback. Currently users are not able to access documents online due to security issues.

"Yesser": Yesser is a good idea endeavouring to achieve their e-Government goals that announced. As Yesser mentioned their rules only informative and to coordinate between public sectors and recently they offer fund. *"The organisation connecting with Government Security Network (GSN) and Government Service Bus which are offered by Yesser". These connections allow the organisation to provide two important e-Services which are query about citizens identity and Labour Ministry query services."* However, the e-Services provided through "Yesser" are limited and required long procedures. The organisation offers all e-Services via their own website portal, only an URL link is available on Saudi National Portal.

Portal: *"The organisation is aware of importance of availability of advanced portal to be able to offer e-Services. Thus, recently the organisation developed a special portal for providing e-Services. This portal contains most of the organisation's e-Services.*". The availability and accessibility of e-Government transactions is not a barrier for any ICT projects at the organisation. The best characterises of provision of the organisation's government e-Services is one way full transactions possible. "*The quality of the Municipality 's website regarding the availability, accessibility, connection speed, update, content and e-Services is excellent.".*

Business processes: *"Some business processes were changed using BPR tool and employees were happy to use the new processes because they recognized the value of ICT in saving them time and effort"*. For example, the system eliminated redundancy and inaccuracy of the data about financiers by entering each financier's record once, and storing all this data at the server of the central administration of the organisation,

which is accessible by all departments. Internal Internet accounts are available for most of organisation employees. *"The main ICT applications projects have been implemented at the organisation are core business, ERP (in-house development), and a new e-Services website portal.*" The organisation's average (out of 7) of internal capacity to pursue the following information management activities are high: Produce information = 6, Gather information = 6, Digitize Information = 6, Process information = 6, Analyze information = 6, Distribute information = 5, Public access to information = 5, and Archive information = 5.

ICT infrastructure: *"Although the organisation hardware, software and connectivity is highly developed there is a problem in connecting to some specific small towns and villages through Internet Service Providers (ISPs) which is affected the organisation e-Readiness.".* Currently the organisation is implementing a new project to connect all villages to the computer information centre at Riyadh. The organisation was implemented IT security solutions and polices by allocating consultants from Prince Mogren Chair of Information Security at King Saud University. Operation and maintenance are available to ensure quality of hardware and software. the organisation's average (out of 7) of internal capacity is satisfactory however hardware and technical support are high as following: Quality of software applications = 5, Quality of connectivity (WAN & LAN) = 4, Quality of ICT security = 5, Quality of hardware = 7, and Quality of technical support = 7.

Human resources: "*It was difficult to find qualified people to be involved in the e-Government projects in public sector so the organisation allocated outsourcing employees through contracts with ICT private sector implementers.*" *"Although many of the employees have positive attitude towards the e-Government services, there is still a need for awareness initiatives to be undertaken to further promote the value of e-Government among civil servants and middle managers.".* The organisation offers training courses internally and workshops as well for the employees. In addition, there is e-Services department responsible to provide end-to-end services. Also. IT department has been developed an e-Services help desk application internally to respond to user's requirements.

As for the importance of the seven dimensions in affecting e-Government readiness, strategy ranks first as a corner stone in the success of any project, followed by the

right processes. Next, human resources involved in the project, followed by the ICT infrastructure dimension. ICT architecture (portal) are the fifth factor, followed by "Yesser", and finally the user access which is only considered a tool that assists in realising e-Government goals and objectives.

E-Government Overview

"The roadmap to e-Government implementation in Saudi Arabia has been developed, but the execution is slow."

"Driving forces are essential in the development of ICT sector in Saudi Arabia. Government organisations won't improve their infrastructure if there is no driving force such as adopting e-Government strategy. This is why they have to work in parallel. We only started to develop e-legislations when we were forced to [i.e. adopting e-applications also requires e-legislation]."

The main factors expect to affect the e-Readiness and make some government organisations are more ready than others in the adoption and diffusion of e-Government organisations in Saudi Arabia are:

- Verities type of services provided
- Verities number of services provided
- leadership support
- solid planning

Many barriers were faced in the adoption of online services as follows:

- absence of communication between government organisations
- the e-Government national strategy is not clear
- absence of e-laws and regulations
- ICT projects difficulties.

Interview Three

Interviewee: Country Manager of IT Projects

Strategy: "*The head of e-Government committee is the minister.*" The main IT vision in Saudi Arabia is not only about e-Government but rather about achieving a digital society that includes legislation and e-citizens or e-society as a whole. In this regards, the major focus must be on accomplishing an electronic- enabled awareness and knowledge in which e-Government would be a part of this overall goal. The major purpose behind allowing for IT in public organisations is reducing distance and time by using the Internet.

"The e-Government strategy have been developed based on the plan of transforming to e-Services." The services that have the most impacts on citizens and other stakeholders presented first in order to achieve positive impression. Another criteria to which services will be selected to be offered to the general public is how ICT-effective and fast implemented they are. *"This needs high level of strategy that leads ICT readiness of organisations in different areas such as infrastructure, HR, re-engineering procedures, coordinating with "Yesser" and offering right delivery channels."* After that services will be included depends on each business case. Additional e-Services will be offered gradually according to how users' awareness, capabilities and needs progresses. *"The e-Services committee is responsible for implementing e-Government projects.*" Concerning the resources needed for e-Government implementation, funds do not constitute a problem since it is provided from the ministry its self. Unfortunately there is no change management department available so far . New e-Services announces via the organisation website, newspapers, facebook and twitter .

"Despite the current obstacles to e-Government in Saudi Arabia and the low level of e-Readiness in many public sectors, we still need to go ahead with the project to increase awareness of e-Government and to start making plans and strategies for ICT development. This will increase organisation's readiness by preparing them to be e-ready well in advance, and will also make government gradually accept the idea of being ready 24/7."

User access: *"Because of importance of user access, the organisation offer different of delivery channels which are website, BPAY, ATMs and telephone.*" Around four

thousand and five hundred (4,500) employees work at the organisation included all forty 40 branches. The organisation offers around one hundred and eighty (180) e-Services as follows. Around eighty (80) G2C e-Services such as applying for exemption of their real estate fund or irrigations fund. Twenty (20) G2B services in serving companies in registration. The organisation offers also around Twenty 20 G2E e-Services via ERP and emails. The organisation offers about sixty (60) G2G e-Services such as e-payment government organisations orders. "SADAD" was established by the organisation in order to ease e-payment (ATMs, BPAY and telephone) for all stakeholders and monitor by the organisation. All the public can provide feedback on online services. Users are not able to access documents online only can access announcement.

"The organisation provided the services online and announced it publicly. The organisation *responsibility ends here. The users have to decide themselves on how to use. It's totally up to users, the services are online and we still have the other physical channels available in case they decided not to use the online ones."*

"Yesser": There are advantages of the e-Government national program "Yesser" however still need a lot of work in order be able to resolve many issues such as lack of qualified human resources, complicated procedures, and delay in ordering fund. *"Also, there is a delay in connecting with Government Security Network (GSN) and Government Service Bus which are offered by "Yesser" despite the services provided through them are limited and that affected our e-Government readiness negatively."* Thus, these led to only an URL link belong to the organisation is available on Saudi National Portal. "*Only few organisations were connected to the GSN and GSB because of both lack of organisations e-Readiness in ICT infrastructure and lack of systems compatibility."*

Portal: *"One of the important factor to offer e-Services is website portal so* the organisation *offers all e-Services on the website portal. Assessing e-Government progress is applied on monthly basis over all ICT related fields such as, quality of the website and ways to improve it and to add more online services, foster Intranet applications, increase automation of internal processes and digitisation of different*

types of information, increase awareness of employees about e-Government value and encourage them to rely more on ICT in their work."
The availability and accessibility of e-Government transactions is not a barrier for any ICT projects at the organisation. The best characterises of provision of the the organisation's government e-Services is one way interaction possible. There is always a continuous monitoring of the usage of the website in the two languages provided: Arabic and English. the organisation was developed a new website portal two months ago however still the e-Services offered are not satisfactory, the need more development. the organisation was created a new department to monitor and update the website regularly. The quality of the organisation 's website regarding the availability, accessibility, connection speed and update is excellent however content and e-Services are not satisfactory.

Business processes: *"In addition to allocating the needed resources, e-Government implementation also required a change, and occasionally a total re-engineering of some business processes that can assist in facilitating web-based standard of procedures for stakeholders.*" for instance, a great part of the information accessible at the Ministry was stored electronically; essential information to stakeholders is available and updated regularly on the organisation's website as mentioned above. In addition, most of the internal communication between employees now takes place over the Ministry's Intranet. However there is a plan to re-Engineer all the ministry procedures. *"The main ICT applications projects have been implemented at the organisation are core business, ERP (ORACLE), ECM, and developing a new website portal. The organisation is relatively in a more advanced situation in terms of quality of information management.*" *In addition to allocating the needed resources, e-Government implementation also required a work flow change, collaborative integration and occasionally a total re-engineering of some business processes that can assist in facilitating a Web-based standard of procedures for stakeholders*. The organisation's average (out of 7) of internal capacity to pursue the following information management activities: Produce information = 5, Gather information = 6, Digitize Information = 4, Process information = 5, Analyze information = 6, Distribute information = 6, Public access to information = 6, and Archive information = 7.

ICT infrastructure: The hardware, software and connectivity at MOF is advanced and up-to-date. Currently the organisation are implementing new projects to develop the ICT infrastructure and connecting all branches. The organisation was implemented IT security solutions but polices didn't apply on employees. Operation and maintenance only operate during working hours. The organisation is relatively in a more advanced situation in terms of quality of hardware and connectivity. The organisation's average (out of 7) of internal capacity to pursue the following: Quality of software applications = 6, Quality of connectivity (WAN & LAN) = 7, Quality of ICT security = 5, Quality of hardware = 7, and Quality of technical support = 5.

Human resources: *"The major barrier that delay e-Government development and implementation is human resources."*. It is very difficult to change the culture of employees such that they can adapt with new working techniques that required computer skills. Furthermore, finding qualified staff to be involved in the projects is another challenge. As for the human resources, e-Government tasks are divided into units, and every unit is fully accountable for its responsibility to impose monitoring and control on performance. The IT department at the organisation adopts a dynamic policy regarding its human resources with an objective to choose the right employees to implement the ICT strategy. Also, there are barriers because of difficulties in keeping qualified technical IT staff due to the high demand of their expertise in private sectors that offer superior rewarding packages than those provided by the government organisations. *"The organisation have its own Training Centre offers courses such as ICDL is a UNESCO approved program that aims to enhance people's knowledge and awareness of IT."*. It will be slowly introduced to government employees and later on, it will be a must for any form of employment. The organisation established help desk to assist employees and other stakeholders. The policy makers have high level of awareness of the benefits of e-Government than the department and sections managers and users.

Strategy is considered the most important dimension e-Government readiness success, followed by the ICT infrastructure dimension. human resources then ranks third before "Yesser" dimension that comes as the fourth factor. Then processes, user access and finally ICT architecture (portal).

E-Government Overview

The main challenge to the development of e-Government in Saudi Arabia is the lack of ICT infrastructure, human resources, top management support. It is advisable "Yesser" should have the power to force government organisations to adapt e-Government also its important to force the Ministry of Civil Service to upgrade the IT employee salary and other benefits. Although the organisation offers good quality information, there is still a need to apply further effort to be ready, the ministry readiness only between %30-40. The progress of implementing e-Government is slow in Saudi Arabia. Some government organisations are more ready than others in the adoption and diffusion of e-Government in Saudi Arabia due to three factors: 1) lack of top management support 2) lack of fund 3) resistance to change.

Interview Four

Interviewee: Data Processing Manager

Strategy: The organisation was established on 1950. The mission of the organisation is briefly to administer and collect zakat on commercial goods from Saudi individuals and companies and from individuals and companies of GCC states subject to the same treatment like Saudis, and to administer and collect tax from non-Saudi individuals doing business in the Kingdom, resident Saudi companies on shares of non-Saudi partners, and non-resident companies doing business in the Kingdom through a permanent establishment or deriving income from a source in the Kingdom.

"From the organisation leaders prospective, IT is seen as the most important facilitator and contributor to the organisation's success."The organisation is seeking suitable technologies for its operation, but it is still considered to be lagging in terms of implementing up-to-date systems and applications. Currently, the organisation is renewing the old e-Government strategy to achieve objectives that most of them not accomplished so far such as using advanced tax application connected to "SADAD" to issue the organisation certificates, e-payment, e-filing etc. Unfortunately the organisation's IT department takes a long time around one or two years to examine and investigate the potential of applications and systems before adopting them. *"The organisation should enforce IT laws and legislations. The current laws do not go in depth to cover online activities. The task of making rules, laws and legislations in general is beyond the organisation's responsibilities."*

The action plan is still under preparation. *"The e-Services committee was recently created and responsible for implementing e-Government projects. The organisation is adapting e-Government future development plans but "..... the organisation is adapting important e-Government future development plans but unfortunately it is not clear.*" *it is not clear.*" It is also to have a future plan to build a high quality of portal as it is assessed regularly by Ministry of Communication and Information Technology (MCIT): *"OEGR assessment of portal is undertaken regularly within MCIT."* Funds do not constitute a problem since it is provided from the department itself and "Yesser". There is no change management department available. New e-Services announce via website and newspapers.

User access: The organisation has ten branches and around one thousand and one hundred (1,100) employees. *"All e-Services offer on the website and through BPAY and ATMs to ease accessibility.*" The organisation offers only eleven (11) e-Services as follows. Around five (5) G2C e-Services such as e-payment ("SADAD"), recruitment and update organisations details. Five (5) G2B e-Services in serving companies in paying through "SADAD". DZIT does not offer any G2E e-Services. The organisation offers only one (1) G2G e-Services such as provide organisations with certificates. Public can provide feedback only by email. Users are not able to access documents online.

"Yesser": *"The idea of establishing the e-Government national program "Yesser" is excellent but the implementation is slow so that affected organisations readiness progress."*. "Yesser" is good in providing theories but practically is bad. There is a delay in ordering fund from "Yesser" because of bureaucracy. Also, "Yesser" should has power in order to force government sector to move faster towards e-Government. *" The organisation has connected to Government Security Network (GSN) and Government Service Bus (GSB) which are offered by "Yesser" however the benefits is low due to limited services offered from them and lack of compatibility and coordination.*" Only an URL link is available on Saudi National Portal.

Portal: The organisation offers few e-Services on the website portal. The availability and accessibility of the website is not satisfactory. The best characterises of provision of the organisation's government e-Services is one way interaction possible. The usage of the website in the two languages provided: Arabic and English (only informative). The organisation was developed a new website portal two months ago however still the e-Services offered are not satisfactory, it required more development. *"The quality of the organisation's website is not satisfactory regarding connection speed and update, content, and e-Services."*.

Business processes: *"The organisation did not apply any re-engineering business processes tool so that delay the progress of the organisation e-Government readiness.* " *The main ICT applications projects have been implemented at the organisation are core business (ready made application) and ERP (under implementation)."* The organisation's average (out of 7) of internal capacity to

pursue the following information management activities: Produce information = 5, Gather information = 4, Digitize Information = 5, Process information = 6, Analyze information = 5, Distribute information = 3, Public access to information = 4, and Archive information = 1.

ICT infrastructure: The hardware, software and connectivity at the organisation are a barrier due to moving to a new building, so that caused a delay in implementing some ICT infrastructure projects. *"Currently the organisation is implementing new projects to develop the ICT infrastructure such as building a new data centre, LAN and WAN and high speed connection with all branches.*". The IT security solutions is still need more advanced hardware, software and keep them up-to-date however polices did not exist. *"Operation and user technical support is playing an important role to respond and resolve users issues only operate during working hours.*". The organisation are not satisfactory is relatively in a low readiness situation in terms of quality of hardware and connectivity. The organisation's average (out of 7) of internal capacity to pursue the following: Quality of software applications = 3, Quality of connectivity (WAN & LAN) = 3, Quality of ICT security = 4, Quality of hardware = 3, and Quality of technical support = 4.

Human resources: *"Lack of ICT managers who have a bachelor and above and qualified ICT staff in some public organisations cause a delay in e-Government readiness".* Top managers don't pay enough attention in adapting e-Government. The organisation need to hire qualified staff in order to be able to implement e-Government projects. The organisation arranged several training courses such as ICDL for the end users that seeks to improve employee's knowledge and awareness of IT.
"The organisation has established user technical support to help employees and other stakeholders.". The policy makers have better level of awareness of the benefits of e-Government than the department and sections managers and users. ICT infrastructure is considered the most important dimension of e-Government readiness success, followed by the ICT architecture (portal) dimension. Strategy then ranks third before processes dimension that comes as the fourth factor. Then "Yesser" dimension, human resources and finally user access.

E-Government Overview

The organisation e-Government readiness is not more than %30. The progress of adapting e-Government at the organisation is slow and at Saudi Arabia as well. The main factor expect to affect the e-Readiness and make some government organisations are more ready than others in the adoption and diffusion of e-Government organisations in Saudi Arabia is existing of good IT department. Many barriers affect the adoption of e-Government as follows:

- the wide geography of Saudi Arabia
- lack of ICT infrastructure in some areas
- the national e-Government adoption strategy is not clear
- the Interior Ministry was ignoring "Yesser" and established "ALALM" company for information security doing similar objectives and
- lack of "Yesser" power.

Interview Five

Interviewee: Information Technology Manager

Strategy: The organisation used to be managed by different bodies with different rules, regulations and tariffs, for each port. In 1976, the Saudi Government decided to create the organisation, which was directly linked to the Prime Minister. The aim was to improve and develop all Saudi Ports and to run them in the most advanced and effective ways, in a unified manner.

The government intends to become the driver that will influence the public sector to be e-enabled and IT oriented, especially when the government adopts new technologies and forces the public sector to utilize electronic means of communication and interaction. *"Due to the importance of strategy, the organisation prepared e-Government strategy. This is the first year will be phased in progressively and are expected to take 5 years for full implementation."*. The organisation adopted IT polices an rules internally that presented by the Ministry of Communication and Technology and Communication and Technology Authority but in reality nothing applied.

Due to lack of qualified staff, the organisation intends to sign a contract with King Saud University to manage the implementation of the twenty projects that revealed from the e-Government strategy. Unfortunately there is no action plan prepared so far. *"The e-Services committee was recently created including all branches.*" It is responsible for implementing e-Government projects and operating the ports. There is a delay of Funds provided by the Ministry of Finance and 'Yesser". There is no change management department exist. New e-Services announce via website, newspapers and brochures.

User access: The organisation has nine branches and around three thousand and seven hundred thirty six (3,736) employees. The authority offers only ten (10) e-Services as follows. Three (3) G2C e-Services which are two queries and importing cars form. Three (3) G2B e-Services issuing regular reports. The authority offer also three (3) G2E e-Services which are accessing salary, balance of leaves and issuing identification letters. Finally, the authority offers only one (1) G2G e-Service which

is "Saudi Edari" implemented to exchange documentation between the organisation, Ministry of Finance and Custom Department. All e-Services offer on the website. There is a dedicated page on the website that give opportunity to public to provide feedback. Users are not able to access documents online.

"Yesser": "Yesser" is playing only informative roles and this not enough to be succeed. "Also, there are many factors the led "Yesser" to be failed so far in achieving the required tasks which are lack of power, lack of qualified people and complicated procedures.". The organisation exchanges information with "Yesser" by email and CDs. *"The GSB offered by "Yesser" is not satisfactory and not able to provide the public sectors requirements to offer e-Services so that effect sharing information with other public sectors. The organisation is not seeking to connect to GSN because the benefits is low so that affected sharing information with other organisations.*". The organisation is not offering any e-Services on Saudi National Portal.

Portal: The organisation offers few e-Services on the website portal most of them are queries. The best characterises of provision of the organisation's government e-Services is one way interaction possible. The usage of the website in the two languages provided: Arabic and English (only informative). *The quality of* the organisation*'s website is not satisfactory regarding the availability, accessibility, connection speed, update, content, and e-Services. So, this indicated that the organisation e-Government readiness is low."*.

Business processes: *"The organisation did not apply any re-engineering business processes tool so that affected negatively the e-Government readiness."*. The main ICT applications projects have been implemented at the authority are core business, invoicing systems, marine inspection, ERP (local) and statistics system.It is very costly to demolish such huge systems.
"*The solution is to develop all governments sharing applications at "Yesser" and have middleware systems that can talk both ways, and to ask developing companies or IT department to link the "Yesser" developed systems to organisations.*"

The organisation's average (out of 7) of internal capacity to pursue the following information management activities: Produce information = 4, Gather information = 4, Digitize Information = 4, Process information = 4, Analyze information = 6, Distribute information = 6, Public access to information = 7, and Archive information = 6.

ICT infrastructure: The hardware and software are advanced. *"However, the external connectivity is a main barrier due to lack of ability of the communication companies. So that caused a delay in implementing some ICT infrastructure projects.*". The LAN is good, in general connectivity at the organisation is not satisfactory. There is Internet connectivity internally and externally. The IT security solution hardware and software is good however there is an absence of polices and rules. Operation, maintenance and technical support are provided to users to handle their needs. The organisation's average (out of 7) of internal capacity to pursue the following: Quality of software applications = 6, Quality of connectivity (WAN & LAN) internal = 6, external = 2, Quality of ICT security = 4, Quality of hardware = 6, and Quality of technical support = 6.

Human resources: *"There are qualified IT people but they are not enough to operate all activities required so the led to a delay in e-Government adoption and diffusion."* Top managers are aware of the benefits of e-Government and recently forcing the sector towards e-Services.

There are plans to introduce computer labs and ICDL and IC3 courses within the authority. There is also an intention to set ICDL and/or IC3 as a minimum requirement for any form of employment in the authority.

The organisation has established user technical support unit but unfortunately there is no clear responsibilities. But, a Service Level agreement such as customer service satisfaction is not available so far. The policy makers have high level of awareness of the benefits of e-Government than the department and sections managers and users.

The strategy is considered the most important dimension of e-Government readiness success, followed by the human resources, ICT infrastructure. ICT architecture

(portal) dimension then ranks fourth before processes dimension that comes as the fifth factor. Then user access and finally "Yesser" dimension.

E-Government Overview

There is a shortage in the organisation of e-Government readiness. The progress of adapting e-Government at the authority after starting the new e-Government projects is good however over all the country is slow.

The main factor expect to affect the e-Readiness and make some government organisations are more ready than others in the adoption and diffusion of e-Government organisations in Saudi Arabia are:

- leadership
- continuous project monitoring and control
- utilizing the best technologies possible according to available financial
- resources
- strong willingness to change from traditional work channels to more
- progressive, modern and technically safe methods.

Many barriers were faced in the adoption of online services as follows:

- lack of good ICT infrastructure
- lack of qualified people
- citizens' unawareness of technology and low level of IT literacy
- e-Government is not yet a priority among the other government ministries
- insufficient technical support from the private sector (implementers)
- the private sector's incapacity and unwillingness to participate in e-Government.

Interview Six

Interviewee: General Supervisor of IT Application

Strategy: The Minister is responsible for the execution of the government policy. *"Providing services online and adopting up-to-date technologies within the organisation are supported by the minister and senior officials.*".

In this respect, *"The leaders at the organisation faced many challenges before going online such as preparing comprehensive strategy that ensuring improving ICT infrastructure, business processes, people, security and automation of documents. Last few years, its website offers a range of e-Services particularly to students inside and outside Saudi Arabia. It was initially an information website but many online services were added recently.*"
"The action plan concerned with modernising the organisation through the allocation of budget, timeframe, and the use of ICT applications.". It is only assessed by regular reports received from all Saudi Arabia Cultural Mission (core business). There is no e-Government or e-Services steering committee instead each project monitored and managed separately. The organisation applied sufficient policies to ensure the implementation of the e-Government project all over the sector. The organisation have dedicated fund for its five years e-Government plan which provided from Ministry of Finance and "Yesser". *Human resources hired by Ministry of Civil Service and projects outsourcing to ensure the quality of e-Services.* There is no change management. New e-Services announce via website, conferences, TV, newspapers and expos.

User access: *"Recently many e-Services developed for students specially who are studying overseas such submitting application forms online for all services needed, tracking work flows and scanning required documents."* Also, other e-Services added later including video library, statistics, instructions on how to accomplish various tasks with the organisation. Students can also obtain phone and email contacts for inquiries.

For citizens the organisation offers applying for scholarship services to improve the quality of services provided. Many e-Services offer to employees through self services. For other government departments and private sectors only education

commission members' services and statistics. Students can provide feedback on online services by annual questionnaire. Students are able to access, add and delete their documents online.

"Yesser": The e-Government national program "Yesser" has plans and sufficient fund from the government. However, the performance of implementing their plans is not satisfactory. There is no exchanging information between the organisation and "Yesser". The organisation only connected to GSN and a link of e-Services on Saudi National Portal.
"Nowadays, each ministry has independent applications and networks. Each ministry works and develops its own ICT infrastructure independently. These systems should be reassessed and interconnected in order to gain a complete e-Government. This would be achieved by connecting to the "Yesser" properly."

Portal: *"Because of importance of developing website portal, the organisation offers around % 90 of e-Services via the website portal of total services."* . The description of provision of the organisation's government e-Services is two-way interaction possible. *"The quality of the organisation's website regarding the availability, accessibility, and connection speed, content, e-Services, and update is excellent, that led the organisation to win the best portal prize in Saudi Arabia and be one of few organisations accomplished e-Government readiness."*

Business processes: *"The organisation used Business Processes Improving (BPI) during implementing the e-Government strategy.The main ICT applications projects have implemented in the organisation: core business, electronic information systematic, ERP and ECM.*" Data and information flow is important to achieve good content, accurate and shared data, timelines and convenience. Data and information flow can be achieved by applying information management tools such as: databases, data warehouses, SMS, Web site, or e-Mail. The organisation's average (out of 7) of internal capacity to pursue the following information management activities is high level: Produce information = 6, Gather information = 6, Digitize Information = 6, Process information = 7, Analyze information = 7, Distribute information = 7, Public access to information = 7, and Archive information = 7.

ICT infrastructure: "*ICT infrastructure at the organisation is advanced and up-to-date including hardware, software, back up and connectivity, so that assists the organisation to present e-Services.".* Currently the organisation is implementing new projects to develop the ICT infrastructure. In addition, developing new ICT infrastructure and data centre for a new building of the ministry. The Internet excellent but sometimes the organisation faces difficulties because of disconnect of the sea Internet cable (last year occurred four times). The organisation applied ICT security solutions and policies eventually received ISO 2007-9001 standard certificate. *"Technical help desk is vital to fix technical issues such as PCs, printers, networks and applications.".* The organisation's average (out of 7) of internal capacity to pursue the following is high level: Quality of software applications = 6, Quality of connectivity (WAN & LAN) = 6, Quality of ICT security = 6, Quality of hardware = 7, and Quality of technical support = 6.

Human resources: *"Senior managers support e-Government adoption and particularly that led to accomplish a good level of organisation e-Readiness.*". Human resources is not an issue at the organisation due to dealing with outsourcing companies that provide qualified staff. The organisation offers training courses, and license certificates for all employees in order to improve their IT skills. There is a e-Services department for each project. Also, there is a technical support department to assist users. The policy makers, the department, sections managers and users have high level of awareness of the benefits of e-Government.

As for the priority of the seven dimensions affecting e-Government readiness at the organisation, the most important factor is strategy, followed by human resources, ICT infrastructure, processes, user access, ICT architecture (portal), and finally "Yesser".

E-Government Overview

Although the organisation has achieved high quality e-Services still require to apply additional effort to automate all services. The status of e-Government at the organisation over all is around % 90 ready. The progress of implementing e-Government in Saudi Arabia is improving.
Some government organisations are more ready than others in the adoption and diffusion of e-Government in Saudi Arabia due to four issues:

- bureaucracy

- resistance to change
- awareness
- readiness of ICT infrastructure
- Funds
- IT implementers.

Interview Seven

Interviewee: Dean, Doyenne of E-Services

Strategy: An e-Government committee has been created as required by Saudi Council of ministries decision no. 8189/MB in 19-6-1426 H/23-7-2005 G. The University's vision and goal is to enable students, residents and other stakeholders to access the University services easily and saving their time, money, and effort. the University's strategy is created to:

- create a system for the provision of information outside the University,
- ensure that expands beyond official working hours,
- offer some techniques that are appropriate to all students and discover ways for electronic progress,
- implementing e-Government at the University was to review and adjust in each department to avoid any redundancy or duplication of work over all internal departments,
- develop policies and regulations relevant to the e-Services trends between stakeholders but still restricted,
- motivate end users to use e-Services.

"Leadership is important to identify and to achieve the strategy goals the organisation should be e-ready by allocating qualified people, restructuring business workflows, building suitable databases and applications of all public organisations at Yesser, building ICT infrastructure, developing a right website portal and easing accessibility."

"The action plan implemented based on the ICT strategy to transform to e-Government services for implementing suggested projects and measure their performance via identifying KPIs." The e-Services committee follow up the e-Government ICT strategy. There is no future development plan however the strategy reviewed to operate parallel with business strategy, this could affect the strategy in the long term. Regarding funds resource, it's not constitutes a problem since the University receives funds for e-Government plans provided from Ministry of Finance. Although change management is important Out Reached Department can do some relative works that facilitate implementing changes. the University announce new e-Services via newspapers, KSU website, TV and radio, media channels inside the University.

User access: "*It is important to provide multi types of delivery channels for all stakeholders such as website, e-payment methods and mobile.*"The University offer G2E e-Services such as queries about salary, vacations, request to attend conferences etc via the internal website portal. G2C e-Services such as students' electronic enrolment, accommodation, lecture enrolment etc via the website portal. G2G offer some e-Service only with "Yesser" and Ministry of Civil Service. G2B some services in helping students to find suitable careers in private sector. All the public can provide feedback on online services and influence the continued development of the University's e-Government offering in each application also via special website portal. Only some documents can user access online such as announcement, new decisions. Users can do queries through workflows but can't update.

"Yesser": The idea of foundation of e-Government national program "Yesser" is good but there is a delay in their plans due to lack of power specially to force small organisations toward e-Government. "Yesser" should activate their roles by providing consultations to government organisations. "Yesser" got SR3.0000.000.000 (AUD 800.000.000) fund from Ministry of Finance when its established in 2005, however they didn't use them in proper way so far. The University only have some links on Saudi National Portal.
"There is a smooth progress in the e-Government organisational readiness field in Saudi Arabia and the future is promising, but it is not the organisations responsibility only to work on this. There is also a strong need to give "Yesser" proper authority to look after this project and enforce public sector to be ready to connect to GSB and GSB via suitable SSO portal."

Portal: *"Because portal is important for organisations to offer e-Services,* the University *offers around %60 e-Services via the website portal of total services.*" The availability of e-Government transactions via the portal sometimes be a barrier to new research projects at the University. The best characterizes the provision of the University's government e-Services is complete transaction possible within single agency. *"The quality of the University's website regarding the availability, accessibility, content, e-Services, update, and connection speed is very good so that led to provide good quality of e-Services.".*

Business processes: *"The University didn't apply Business Processes Re-engineering (BPR) only as alternative use adjusting and documenting the procedures. The University should consider this in the near future in order to ease implementing of e-Services. The major ICT applications projects have implemented in the University: ERP, enrolment system, Maxeem System for maintenance, users e-Services, and project management (under construction), this help the University a lot in improving the scale of e-Government readiness lately.*" The organisation's average (out of 7) internal capacity to pursue the following information management activities: Produce information = 6, Gather information = 4, Digitize Information = 4, Process information = 3, Analyze information = 3, Distribute information = 3, Public access to information = 4, and Archive information = 4.

ICT infrastructure: *"ICT infrastructure is not one of the major barriers to the growth of KSUs' capabilities to provide e-Services and transactions, this due to advanced hardware, software and connectivity already applied.". "There are also new project to expand the ICT infrastructure, reformate and modernize the data centre, implementing integrated communication systems including VoIP to reduce cost of call. There is intranet connectivity and digital interaction between all departments* and ability to access specific applications from home over IP-VPN*".* The University have ICT security solutions and policies but the user's awareness is not satisfactory. Operation and maintenance department is working between 7am – 4pm to ensure the quality of services provided. The University's average (out of 7) internal capacity to pursue the following: Quality of software applications = 5, Quality of connectivity (WAN & LAN) = 6, Quality of ICT security = 6, Quality of hardware = 7, and Quality of technical support = 6.

Human resources: *"The main challenges facing e-Government implementation are the culture and skills of employees. There is a lack of numbers of qualified employees due to the old and limited recruitment system which provided by Ministry of Civil Service that cause a high turn over to the private sector.". "The University provides multi training courses, user guides, user and technical support by user support department.*". The level of awareness of the benefits of e-Government in the University for the policy makers and students is excellent however the department and section managers need more attention.

As for the priority of the seven dimensions affecting e-Government readiness at the University, the most important factor is strategy, followed by human resources, processes, user access, ICT infrastructure, ICT architecture (portal), and finally "Yesser".

E-Government Overview

The University has carry out some advancement in e-Government but is still not completely ready. The success of e-Government implementation depends on the participations of top management, citizens, employees, and other government departments. Also, motivate employees through granting them incentives based on their achievements is highly recommended. This can be monitored electronically by designing applications particularly for this purpose. The progress of implementing e-Government in the University is fast but in Saudi Arabia is medium. The major barriers you expect to affect the e-Readiness of government organisation in Saudi Arabia are:

- lack of exchanging information between organisations.
- lack of cyber law.
- government procurement system is old.
- delay of receiving funds.
- lack of good ICT implementers.

Some government organisations are more ready than others in the adoption and diffusion of e-Government in Saudi Arabia due to three factors:

- leadership.
- organisational culture .
- availability of fund.

Interview Eight

Interviewee: General Manager of Information Technology

Strategy: *"The organisation bases its work on modern strategies and advanced postal services, to keep pace with developments in the postal market and the postal industry.*"Chairman's message to serve this institution and its customers, based on a philosophy of development driven by its underlying human element, which is the main element in the entire postal process and the element seen first by public clients. *"The leaders identified the vision starting from the strategic changes witnessed by the organisation regarding services*" as well as social and economical philosophies, the organisation relies, as a civilized, hi-tech corporation, with a deep-rooted history and technical ambition, on the human component that are the foundation of postal operation and modern postal technology. Also, to promote and support the e-Government program and create new work opportunities for our citizens, while reinforcing the foundation of trust that supports them.

The organisation receives e-Services project funds from Ministry of Finance. Evaluation of the required funds always take place based on specific priorities. *"The president of the e-Government committee is the chairman."*. For the human resources, the organisation can hire employees via both Ministry of Civil Service and direct contract called "Operation system" that help to select qualified people. The organisation adopted and applied policies and legislation and rules that control and monitor the stakeholders relationships and e-Services offered during implementing the strategy.

Project Management Office (PMO) is responsible to execute the action plan of e-Government projects. Although there is no change management department available business development and IT department are playing the same roles. New e-Services announces via the organisation website, "Yesser" and newspapers.

User access: Around ten thousands (10,000) employees work at the organisation included around six hundred 600 branches inside and outside Saudi Arabia. The organisation offers around thirteen (30) e-Services as follows. Around ten (10) G2C e-Services such as tracking system, registration renewal "WASEL", mail online gate. Six (6) G2B e-Services such address validations for banks communications companies. The organisation offers also around ten (10) G2E e-Services via ERP self

services (all employees can retrieve their all information). The organisation offers four (4) G2G e-Services through "ALELM" security Information Company that belong to the Interior Ministry Company two-way connected. *"The organisation delivery channels are website, IVR, mobile, ATMs and Kiosks.".* Website, Facebook and Twitter are available for public to provide their feedback. There is no documents system could allow users to access documents online.

"Yesser": "*The performance of "Yesser" is not satisfactory they did not even cover %40-50 from their promises. This due to lack of qualified people and good e-Government framework to assess government organisations readiness properly.*". The organisation is connecting to Government Security Network (GSN) and Government *"Government Service Bus (GSB) which are established and managed by "Yesser". However, Saudi Post receives low benefits because of limitation of services provided by "Yesser". There is a need of "Yesser" to improve their services offered in order to benefits from other organisations services."*. The organisation offers all e-Services via its own delivery channels mentioned above, only an URL link is available on Saudi National Portal.

Portal: *"The organisation's portal provides most of the organisation e-Services.*" The availability and accessibility of e-Government transactions is not a barrier for any ICT projects at the organisation due to type of mail work. The best characterises of provision of the organisation's government e-Services is two-way interaction possible. *"The quality of the organisation's website regarding the connection speed, update, content and e-Services is good that helps to offer a good quality of e-Services.".*

Business processes: *"The department of Quality and Assurance helped in several business processes were changed even they did not use any BPR tool. This changes in businesses workflow eased the organisation moving towards e-Services quickly".* Internal Internet accounts are available for most of organisation employees. *The main ICT applications projects have been implemented at the organisation are core business (Post all), Oracle ERP, CRM, car tracking system, post mobile addresses validation.* Data and information flow is important to achieve good content, accurate and shared data, timelines and convenience. Data and information flow can be

achieved by applying information management tools such as: databases, data warehouses, SMS, Web site, or e-Mail. The organisation's average (out of 7) of internal capacity to pursue the following information management activities are high: Produce information = 5, Gather information = 6, Digitize Information = 6, Process information = 5, Analyze information = 4, Distribute information = 4, Public access to information = 6, and Archive information = 2.

ICT infrastructure: The organisation hardware, software and connectivity is advanced. *"The new ICT infrastructure projects at the organisation are LAN and WAN (530 offices), renewing all servers, developing a new Backup system and e-mall to ensure our organisation e-Readiness.". "Hardware and software at the organisation is advanced and up-to-date. We use reputable operating systems such as Linux, Unix, Windows Server, and employ compatible hardware and software standards to ensure usefulness, flexibility and reliability. Local/ national/ international levels will improve organisational e-Government readiness"*. The organisation was implemented IT security solutions and polices and already received ISO 2007:9001 certificate. Employees have email accounts over all branches. Operating system department is available only during working hours. The organisation's average (out of 7) of internal capacity is high level as following: Quality of software applications = 5, Quality of connectivity (WAN & LAN) = 6, Quality of ICT security = 6, Quality of hardware = 7, and Quality of technical support = 6.

Human resources: Although the organisation got advantages of hiring through two options as mentioned before which are Ministry of Civil Service and direct contracts (operation system) still there is a shortage in qualified people. In this respect, "*The organisation resolves the matter of lack of qualified people by hiring temporary outsourcings in order to be able implement the e-Government strategy.".* Since 2006 the organisation training sector are providing training course for basic IT skills in their three training centres in Riyadh, Jeddah and Dammam city. Also, the training sector offers ICDL certificates. Also. IT department provides support for their new e-Services developed due to absence of user support department. Users satisfaction and technical support departments have been created in order to ensure a achieve customers and employees satisfaction. The policy makers and department managers

have high level of awareness of the benefits of e-Government compared to the sections managers and users who have low level.

As for the importance of the seven dimensions in affecting e-Government readiness, strategy ranks first as a power in the success of any project, followed by the good ICT infrastructure dimension. Next, the right processes, followed by human resources involved in the project. ICT architecture (portal) are the fifth factor, followed by "Yesser", and finally the user access.

E-Government Overview

Although the organisation has accomplished some of the strategy objectives and the process is modest a lot of works required to prepared clear business polices and employees need professional internal polices to work with. The implementation of e-Government project in Saudi Arabia is slow.

The main factors expect to affect the e-Readiness and make some government organisations are more ready than others in the adoption and diffusion of e-Government organisations in Saudi Arabia are:

- leadership
- management barriers
- awareness of the organisation
- having good IT implementers.

Many barriers were faced in the adoption of e-Government as follows:

- lack of leadership
- resistance from decision makers
- delay of fund
- lack of qualified people
- lack of good IT implementers in Saudi Arabia
- lack of "Yesser" rolls.

Interview Nine

Interviewee: Information Technology Manager

Strategy: The future vision of the Kingdom of Saudi Arabia regarding tourism sector, is based on the following themes: the Kingdom of Saudi Arabia, as the land of Islam, seeks for variable and distinguished tourism development, with social, cultural, environmental and economic benefits in the framework of its Islamic values and genuine traditional hospitality. In this respect, *"The organisation aimed to facilitate e-Service delivery for tourists by saving them time, money, and effort. This e-Government strategy vision is supporting by the president of the organisation* .". The action plan was part of the e-Government strategy and managed by Planning and Monitoring Department for developing the public sector through the use of IT. It was expected to play an important role in easing the services and adding more control and accountability on employees and stakeholders.

"The e-Government strategy and action plan of the organisation are based mainly on providing an extra and easy channel of communication for tourists to promote tourism in Saudi Arabia. " Although this strategy is aligned to a large extent with the business strategy of the organisation (around 45%) due to combining antiquities and SCT few years ago which required additional development. There is still room for improvement so that e-Government would be fully supporting, and affecting at the same time, the strategy and objectives of the organisation.

Concerning the resources needed for e-Government implementation, funds do not comprise a problem since it is supplied from Ministry of Finance and sometimes "Yesser". There is no future plans written or developed also there is no change management department but always there was a coordination with Business Development Department as alternatives. New e-Services announces via the organisation's website and newspaper.

User access: *"Due to the significance of providing suitable user access, the organisation has multi delivery channels which are website portal, mobile And "SADAD" (ATMs, BPAY, Bank, telephone).*". These channels allow to offer many e-Services to citizens (most of them inquiries) such as querying about tourism activities and publications. The organisation is exchanging information with only

"ALHAJ" Ministry. Also, the organisation offers e-Services for private sector such as issue hotels, travel agents licenses and payment through "SADAD" system. The organisation offers G2E e-Services via ERP such as salary, identification letter and leaves. All the public can provide feedback on online services via website, help page and live chat. Users are able to access documents online by SEEK search tool.

"Yesser": The e-Government national program "Yesser" roles is not effective based on how they represent them self. "Yesser" performance is slow and their roles and power are limited. "*GSN and GSB are not providing expected services that government organisations need so that affected our progress in providing e-Services.*". Also, "Yesser" did not provide clear plans for public sectors. *". "Yesser" should offer shared ready made applications that all government organisations use instead of each organisation implement its own, for example ERP. The organisation has one-way interaction with "Yesser" only for some queries.*". The organisation only have a link on Saudi National Portal.

Portal: *"The organisation offers around %85 of e-Services via the website portal of total services."*. The accessibility of e-Government transactions is an obstacle only with some e-Services needs to be linked to Interior Ministry. *"Organisation has advanced and reputed operating systems which are Linux installed in back-end log in order to provide a high standard portal layered structure."*. The best description of provision of the organisation's government e-Services is one way interaction possible. The quality of the organisation's website is excellent regarding the availability, accessibility, connection speed, content, e-Services and update.

Business processes: *"The organisation has already applied Business Processes Management (BPM) to avoid barriers and duplications of business work flows. The main ICT applications projects have implemented at the organisation are core business (Tours organizers, Travel and Tourism, Timeshare), Procurement Portal, ERP and Attendance System.*". The organisation's average (out of 7) of internal capacity to pursue the following information management activities is falling between 5 and 7 except analize information is low only 3: Produce information= 5, Gather information= 6, Digitize Information= 6, Process information =5, Analyze

information =3, Distribute information = 5, Public access to information = 5, and Archive information = 7.

ICT infrastructure: *"Hardware and software at the organisation are advanced and up-to-date so that assist to provide e-Services.*". The Disaster Recover (DR) system is not implemented so far but there is a plan to do so soon. There is also a new project to develop the ICT infrastructure such as connecting thirteen areas of travel offices. The Internet provided across the organisation even the branches but not with other government organisation. "*The organisation has advanced ICT security solutions and policies which are certified by ISO*.". The law and HR departments are responsible for the implementation of the polices. *"Operation section follows a check list of all tasks they should do daily, monthly and annual."*. The organisation's average (out of 7) of internal capacity is high level to pursue the following: Quality of software applications = 7, Quality of connectivity (WAN & LAN) = 6, Quality of ICT security = 7, Quality of hardware = 7, and Quality of technical support = 7.

Human resources: Although the organisation can hire employees direct still there is a lack of qualified people. All employees have the basic computer skills that due to restricted policies in hiring new staff. Also, the organisation offers training courses to improve employees IT ability. The organisation has department of services which is responsible to provide users need. E-Services help desk only work during working hours. The policy makers, department and sections managers, and users have high level of awareness of the benefits of e-Government.

As for the priority of the seven dimensions affecting e-Government readiness at the organisation, the most important factor is strategy, followed by processes, ICT Architecture (Portal), "Yesser", ICT infrastructure, then user access and finally human resources.

E-Government Overview

Although the organisation presents many e-Government services there is still a need to apply additional effort to automate the rest of services. The e-Government readiness at the organisation is considered as a very good position, and the shortages

will improve gradually with time. However, the progress of implementing e-Government in Saudi Arabia is under average and need more motivation.

The major barriers that affect the e-Readiness of government sector are:

- Lack of communication infrastructure
- Lack of users awareness
- Resistance to change from government organisations
- Ownership of information
- Lack of Information security
- Lack of good implementers
- Lack of qualified IT mangers
- Procedures barriers.

"Some government organisations are more ready than others in the readiness of e-Government in Saudi Arabia due to availability of qualified executive managers."

Interview Ten

Interviewee: Head of Electronic Services

Strategy: The organisation tries to employ every possible medium to serve the interests of individuals and the community to provide them with what it takes to bring about security, stability and growth.

The minister have decided to launch the portal to make it a communication channel with visitors and whoever seeks true information. This helps them know about security and services provided by the organisation and its relevant agencies to citizens, residents and visitors.

"Organisational e-Government strategy is important for any government organisation, many organisations do not follow other advanced organisation's IT attempts and e-initiatives but always questions people's readiness to use such systems. For example, a feasibility study was conducted a while ago on Internet services and it was seen unfeasible based upon demand. Nowadays, current indicators show that public sector should start thinking to introduce e-Services in the near future. Despite this, it is not seen to be of an urgent matter since e-Government organisational readiness rates is not high. The idea is to check on the proper timings to introduce the service and meet all its prerequisites including people, infrastructure, portal, delivery channels, connecting to "Yesser" and implementing suitable applications."

The portal is meant to mirror reality, and make data available for those interested in facts. It is made in a way that helps people build opinions and impressions about what is going on. It displays accurate knowledge that is away from false information and rumors, which do not bring about goodness to people.

Important directives and regulations are added to explain for citizens and residents procedures that must be followed at Government Administrations in order to finalize their issues easily and promptly. Hence, the organisation has established Electronic Murders Committee.

Funds do not constitute a problem since its provided from Ministry of Finance intending to implement e-Government projects. For the human resources, e-Government tasks are divided into divisions, and every division is accountable for its responsibility to control on performance.

"The e-Government steering committee formed to monitor and control all e-Government projects." Currently the organisation is implementing a new project called "Modeer" to transfer all manual services to automatic. There is a change control department to help and ease the implementation of new IT projects. New e-Services announces via the organisation website, TV, and newspapers. *"Although the e-Government organisational strategy and action plan is aligned to a good level with the business strategy of the organisation there is still need for enhancement so that e-Government readiness would be fully supporting, the strategy and objectives."*

User access: Around four thousand (4,000) employees work at the organisation included all thirteen branches. *"Delivery channels is one of the main factors for organisation e-Readiness to provide e-Services, the organisation offer website portal, SMS, kiosks, ATM's and call centre".* Most of e-Services are queries except e-payment through "SADAD". The organisation offers around twenty (20) e-Services as follows. G2C e-Services such public query for available funds and DMS information. G2G and G2B e-Services all provided through "ALELM" for information security. The organisation offers also G2E e-Services via ERP self services (internal portal). The public are able to represent their feedback on the portal. Currently users are not able to access documents online due to security issues.

"Yesser": "Yesser" is an aspirant program even it is applied partly. *"The organisation connecting to Government Security Network (GSN) and Government Service Bus which are offered by "Yesser". These connections allow 'Yesser" to provide important citizens identity e-Services which required by most of government organisations.*" Also, the organisation offers all e-Services via their own website portal, only URL links are available on Saudi National Portal. In addition, Yesser relies on ALELM security Information Company that belongs to the Interior Ministry using two-way connected in order to provide e-Services via the Yesser portal. In fact, ALELM takes a Yesser role in coordinating between Ministry of Interior and other relative government organisation and also in assisting public sectors to update old data and provide e-Services, this due to the ALELM power since its belong to Ministry of Interior.

Portal: The organisation*'s* portal contains around %30-40 of the organisations e-Services. The accessibility to e-Government transactions is not a barrier for any ICT projects at the organisation. The best characterises of provision of the organisation's government e-Services is complete transaction across multiple agencies. The quality of the organisation's website regarding the availability, accessibility, connection speed, update, content and e-Services is satisfactory.

Business processes: *"The organisation uses BPR tool to re-engineer, manage, and improve the organisation procedures to match users' requirements by application section and NIC."*. The organisation holds a database of information about citizens and residents of Saudi Arabia. The main goal is to record information pertaining to deaths, births, marriages and divorces in Saudi Arabia. It will provide statistical information and indicators about these events.
Also, the organisation is supplemented by a new smart ID card, which features biometric recognition. A small electronic microchip is embedded in the card, which will hold a copy of the holder's fingerprint. Each resident or citizen will be given a unique civil number. With the civil number, any authorized government unit can access the civil status information of that resident or citizen. This procedure is planned to incorporate strict confidentiality and security measures and standards. The smart ID card will mean people no longer need to carry copies of their IDs and passports for transactions with government units. Such information will be accessed directly from the organisation; one will only need to carry his ID card.
The Internet is available internally but only for arranging meetings. The main ICT applications projects have been implemented at the organisation are ERP and "Modeer" project mentioned before. The organisation's average (out of 7) of internal capacity to pursue the following information management activities are medium and high: Produce information = 4, Gather information = 5, Digitize Information = 6, Process information = 5, Analyze information = 5, Distribute information = 5, Public access to information = 6, and Archive information = 6.

ICT infrastructure: Although the organisation hardware, software and connectivity are highly developed there is a need in developing and upgrading them. *"Hence, the organisation is upgrading new projects which are a new LAN (5000 nodes), ICT communication and IT security (hardware, software, policy)."*. *"Day to day*

operation and maintenance are essential for any IT department to resolve daily issues.". The organisation's average (out of 7) of internal capacity is satisfactory however hardware and technical support are high as following: Quality of software applications = 5, Quality of connectivity (WAN & LAN) = 7, Quality of ICT security = 7, Quality of hardware = 7, and Quality of technical support = 7.

Human resources: "*The organisation has qualified people but still not enough be able to cover all required tasks."* For the main e-Government projects the organisation uses ICT private sector implementers. "*The organisation offers training courses internally, via NIC, workshops and conferences. These improve the employees' awareness to be undertaken to additional promote the value of e-Government among civil servants and middle managers"*. In addition, there is e-Services department responsible to provide end-to-end services by following the organisation's work procedures guide. "*E-Services help desk is available via the call centre 24/7 and offers a dedicated assistant call number which is 777"*.
As for the importance of the seven dimensions in affecting e-Government readiness, ICT infrastructure dimension ranks first as a corner stone in the success of any project, followed by ICT infrastructure (portal). Next, strategy then user access, followed by the right processes. Then, having qualified human resources and finally "Yesser".

E-Government Overview

Technology advances smoothly in Saudi Arabia and people used to do things manually not long ago that they are doing now electronically. Adoption and technology acceptance progressed at good pace during past few years.
The main factors expect to affect the e-Readiness and make some government organisations are more ready than others in the adoption and diffusion of e-Government organisations in Saudi Arabia are:

- availability of qualified leaders
- availability of funds
- the organisation's experience.

Many barriers were faced in the adoption of online services as follows:

- lack of human resources
- providing IT training regularly
- keeping qualified people.

Interview Eleven

Interviewee: Information Technology Manager

Strategy: The organisation was established strategy to:

- create a mechanism for the provision of information outside the organisation
- premises that extends beyond official working hours
- provide several techniques that are suitable to all citizens and find ways for
- electronic progress
- disseminate awareness of e-Services among employees and citizens
- develop rules and regulations pertinent to the e-Services trends
- encourage and motivate users to use e-Services.

"*The strategy did not achieved many of the objectives and goals due to lack of motivated leadership and qualified employees.*" Funds do not constitute a problem since they supplied from Ministry of Finance."

The action plan is still under preparation. The e-Services committee was created but it is not affected. The organisation is adapting e-Government future development plans but it is not clear for all departments. There is no change management department due to lack of good management . New e-Services announce via website and brochures.

User access: The organisation has twenty five branches and around six hundred sixty (660) employees. *"All e-Services offer on the website, mobile and through "SADAD" (BPAY, ATMs, Banks, telephone).".* The organisation offers twelve (12) e-Services as follows. Only five (5) G2C e-Services which are submitting new application forms of fund via website and the rest via "SADAD" e-payment. Also the organisation offers two (2) G2B e-Services connected to banks directly. The organisation offers around five (5) G2E e-Services by the organisation self services such as retrieving personal details and training courses. The organisation does not offer any G2G e-Services. Public can provide feedback only by email. Users are not able to access documents online.

"User access is one of the important factors should be considered for the government organisations to be ready to provide e-Government services."

"Yesser": "Yesser" started contacting the organisation only last two years. *""Yesser" should visit government organisations and offer their services and helps. In addition, the lack of "Yesser" power to force public sector to transform to e-Government should be considered.*". The organisation already connected to Government Security Network (GSN) and Government Service Bus which are offered by "Yesser" after long procedures. However, only one service offers through them. Only an URL link is available on Saudi National Portal.

Portal: Only two e-Services out of thirty offer on the website portal. The availability and accessibility of the website is not satisfactory. The usage of the website in only Arabic. "*Currently the organisation is developing a new website portal in order to be able to offer more e-Services.".* The best characterises of provision of the organisation's government e-Services is two-way interaction possible. The quality of the organisation's website is not satisfactory regarding the availability, accessibility, connection speed, update content, and e-Services.

Business processes: *"Unfortunately the organisation did not apply any re-engineering business processes (BPR) tool due to absence of it in the strategy, however some business work flows were changed to automate them.*" The main ICT applications projects have been implemented at the organisation are core business (fund system), CEM, e-payment via "SADAD", ORACLE ERP (under implementation) export and import documents system. The organisation's average (out of 7) of internal capacity to pursue the following information management activities: Produce information = 6, Gather information = 4, Digitize Information = 6, Process information = 5, Analyze information = 4, Distribute information = 6, Public access to information = 6, and Archive information = 3.

ICT infrastructure: "*The software at the organisation is important to achieve reliability of systems, easiness and accessibility. This advances implementing ICT infrastructure projects and speed up the organisation's e-Government readiness progresss"*. Currently the organisation is implementing new projects to develop the ICT infrastructure such as replacing old hardware, building a new data centre and

improving high speed connection with all twenty five branches. Although the organisation has implemented an IT security project there is still need continuous upgrade and update for both security appliance and software. IT security policy is written but did not apply because of lack of awareness from both managers and users.

"This is present also in the organisation as they fear security issues the most, a reason for taking long time to examine systems."

User technical support only operates during working hours. The organisation's average (out of 7) of internal capacity to pursue the following: Quality of software applications = 5, Quality of connectivity (WAN & LAN) internally = 3 and externally = 3, Quality of ICT security = 4, Quality of hardware = 6, and Quality of technical support = 4.

Human resources: "*Lack of qualified ICT staff is one of the main issues that led to a delay in e-Government organisational readiness.". Top managers do not have authority to motivate in adapt e-Government that caused another challenge in e-Readiness.".* The organisation arranged several training courses such as ICDL and IC3 at special training institutes in order to improve user's IT skills and knowledge. Only technical support available for employees. Although the policy makers have better level of awareness of the benefits of e-Government than the department and sections managers and users still can be considered low.
Strategy is considered the most important dimension of e-Government readiness success, followed by the ICT infrastructure dimension. Human resources ranks third before "Yesser" dimension that comes as the fourth factor. Then ICT architecture (portal) dimension and finally user access.

E-Government Overview

E-Government readiness at *the organisation* is between %30-40. The progress of adapting e-Government at the organisation is slow and at Saudi Arabia too.
The main factor expect to affect the e-Readiness and make some government organisations are more ready than others in the adoption and diffusion of e-Government organisations in Saudi Arabia as follows:

- availability of qualified leaders
- availability of qualified IT managers.

Many barriers affect the adoption of e-Government as follows:

- lack of IT e-Government experience
- lack of qualified people
- security barriers in accessing important information at Ministry of Interior
- lack of project management knowledge
- lack of good IT projects implementers.

Interview Twelve

Interviewee: Assistant Manager of IT Development

Strategy: "*The organisation is providing services online and adopting up-to-date technologies within the organisation are supported by senior officials.*". The organisation has been automating transactions since the 1980s.

The organisation understands that awareness is very crucial to IT adoption, requiring time and resources. The organisation's ultimate aim is to transfer transactions from face-to-face to the website. The president of the organisation says, with the support it receives from the leadership of the country, is planning to provide advanced e-Services to all beneficiaries of the services of the organisation to enable them take advantage of these services.

The organisation faced many security concerns in the strategy before going online. Its website, offers a range of services to both locals and expatriates. In this respect, *"The organisation associated with "ALELM" company with responsibility for restricted information security and rules. This information required by most of government organisations."*. It was initially an information website but many online services were added later including instructions on how to accomplish various tasks with the organisation, FAQ, tracking the status of visas, and checking on traffic violations.

In some government organisations workplaces, employees suffered incapable of assisting citizens (for instance, when they follow up their documents progress or to submit new application forms) this because of the ineffective and slow processes of data flow, lack of accuracy and quality of data.

"The e-Government strategy has an action plan with all important KPIs.". The General Department of Planning and Development is responsible for implementing e-Government projects. Concerning the resources needed for e-Government implementation, funds do not constitute a problem since it is provided from the ministry of Finance. The strategy included human resources provided by special agreement with Ministry of Civil Service and outsourcing as well. Each project has its own change management methodology.

"The organisation prepares ambitious future plans to upgrade the level of performance in different services. Such five year plans include the creation of the infrastructure for the e-Government, which already has provided some of its services to citizens and residents at some of the security sectors and other government bodies.". The organisation has conducted many marketing campaigns to increase awareness of its website and the services offered. On many occasions the organisation has advertised in national newspapers, one week conferences about the new e-Services.

User access: Around one thousand and two hundred (1,200) employees work at the organisation included all branches. *"The organisation has recognized the important of e-Services delivery channels so it offers the follows: website portal, via "SADAD" e-payment (ATMs, BPAY, Banks, telephone), Kiosks and mobile.*". The organisation offers many e-Services but most of them are queries as follows. The organisation offers G2C e-Services such as Ministry of Interior "Diwan", civil affairs, traffic and labour importation (most of these services are query and making appointments). The organisation offers G2G e-Services to such as Ministry of Health (health insurance validity for residents), Labour Office, Ministry of Commerce and Retirement Authority. Also, the organisation offers G2B services such passport "NETHAM MOGEEM" system for entry visa and other e-Services including (public query "Hajj", eligibility, insurance validity for residents, query exit/re-entry visa) and "TAM" system for traffic violation and transferring cars. The organisation offers also G2E e-Services via ERP and emails.. All the public can provide feedback on online services. Users are not able to access documents online only can access announcement.

"Yesser": The e-Government national program "Yesser" did not produced expected services that might help and encourage e-Government organisations readiness particularly they received an excellent budget since 2005. *""Yesser" does not provide either coordination with public sectors to ensure compatibility of connecting to GSN and GSB, technical help nor training, so that affect integration and exchanging information with other government organisations.*". Also, "Yesser" should resolve some issues such as lack of qualified human resources, delay in ordering fund, reforming hiring system and easing complicated procedures. The organisation has

connected to Government Security Network (GSN) and Government Service Bus which are offered by "Yesser" through "ALELM" company. Only e-Service links are available on Saudi National Portal. Yesser relies on ALELM security Information Company that belongs to the Interior Ministry using two-way connected in order to provide e-Services via the Yesser portal. Actually, ALELM takes a Yesser role in coordinating between Ministry of Interior and other relative government organisation and also in assisting public sectors to update old data and provide e-Services, this due to the ALELM power since its belong to Ministry of Interior.

Portal: *"Although the organisation offers a considerable number of e-Services on the website portal most of them are query and e-payment via "SADAD". These e-Services represent only %25 of all services that should be offered."* Also, most of the services need modification is not available due to security concerns. The accessibility of e-Government transactions is a barrier for any ICT projects at the organisation because of security issues as mentioned before. The best characterises of provision of the organisation's government e-Services is one way interaction possible. "*The website portal uses a high level of software technology from reputed vendors which is Microsoft SharePoint (MOSS) with BizTalk that provides that provides stronger back-end office of portal layers."*.
"Because the organisation *has many different platforms, we implemented Oracle SOA tool to ease the integration for both databases and portal."*. There is always a continuous monitoring of the usage of the website in the two languages provided: Arabic and English. The quality of the organisation's website regarding the availability, connection speed, update, content and e-Services is good.

Business processes: *"Changes in business work flows are essential to succeed in implementing e-Government projects. In this respect, occasionally a total of some business processes have been re-engineering since the strategy was kicked off. Also, these changes assist in facilitating procedures.*". Most of the internal communication between employees takes place over the Ministry's Mainframe. *"The main ICT applications projects had implemented at the organisation were core business: civil affairs systems ("MGEEM", SHOMOS", "TAM", Appointment system), passports, traffic, training system, Visa system, and ERP (ORACLE).*". The organisation is relatively in a more advanced situation in terms of quality of information system. The

organisation's average (out of 7) of internal capacity to pursue the following information management activities is modest: Produce information = 6, Gather information = 6, Digitize Information = 3, Process information = 4, Analyze information = 4, Distribute information = 5, Public access to information = 4, and Archive information = 5.

ICT infrastructure: "*The hardware and software at the organisation are advanced and up-to-date. However, there are some difficulties in connecting to some areas also in upgrading slow speed of leased and IP-VPN lines.*". The big number of hardware and software led to a lack of coordination. All nine branches are connecting through Mainframe. *"The organisation had implemented IT security solutions and polices based on ISO.". "The Backup and DR systems are upgrade and updated regularly due to teir importance.".* The organisation is relatively in a more advanced situation in terms of quality of hardware and connectivity. The organisation's average (out of 7) of internal capacity to pursue the following: Quality of software applications = 5, Quality of connectivity (WAN & LAN) = 6, Quality of ICT security = 7, Quality of hardware = 7, and Quality of technical support = 5.

Human resources: The organisation has enough qualified people because of special hiring agreement and outsourcing. *"The IT department at the organisation adopts a dynamic policy regarding its human resources with an objective to choose the right employees to implement the e-Government strategy.*". The Department of E-Services Application is responsible for deliver all e-Services. Also, the Department of Quality Assurance and review is responsible for visiting sites, distributing survey questionnaires and satisfying users. *"The organisation has its own Training Centre offers variety of IT courses that aims to enhance people's knowledge and awareness of IT*.".

"The organisation established help desk working 24/7 (40 employees) to assist employees and other stakeholders.". The policy makers, department and sections managers have high level of awareness of the benefits of e-Government than users.

As for the importance of the seven dimensions in affecting e-Government readiness, strategy ranks first as a power in the success of any project, followed by enough qualified human resources involved in the project. Next, the good ICT infrastructure

dimension, followed by high quality of ICT architecture (portal). The right processes are the fifth dimension, followed by the user access, and finally "Yesser" which is only considered a tool that helps in achieving e-Government goals.

E-Government Overview

The roadmap to e-Government implementation in Saudi Arabia has been developed, but the execution is slow. Driving forces are essential in the development of ICT sector in Saudi Arabia. The organisation only started to develop e-legislations when the organisation were forced to [i.e. adopting e-applications also requires e-legislation].

The main factor expect to affect the e-Readiness and make some government organisations are more ready than others in the adoption and diffusion of e-Government organisations in Saudi Arabia are:

- leadership support
- utilizing outsource
- solid planning
- continuous project monitoring and control
- utilizing the best technologies possible according to available financial resources
- strong willingness to change from traditional work channels to more progressive, modern and technically safe methods.

Many barriers were faced by the organisation in the adoption of online services as follows:

- lack of qualified people
- absence of e-laws and regulations
- lack of good IT implementers
- lack of project management and Project Management Office (PMO)
- insufficient technical support from the private sector.

Interview Thirteen

Interviewee: Head of IT Development and Application

Strategy: The organisation was established after numerous studies and research conducted by a number of governmental agencies, to get the appropriate strategies for establishing the organisation under the Royal Decree on 2007 with a capital of 1.5 billion riyals (AUS500 million). The organisation is fully-owned by the Public Investment Fund (Ministry of Finance). The vision to be the trusted, state of the art, healthcare supply chain management company… to meet customer's expectations and together set new standards for healthcare services in Saudi Arabia. The organisation offers its electronic services to provide the suppliers with the required information and the necessary flexibility to deal with the companies.
Regarding the resources needed for ICT including e-Government implementation, funds do not constitute a problem since it is provided from Ministry of Finance.

"The organisation has adopted an active policy concerning its employees with a goal to select the right people to implement the ICT strategy."

The action plan is based on business to government including all health organisations. *"The e-Services committee consists of members from the organisation and representatives from government health sectors.*" There is a change management department to resolve the barriers that facing in dealing with other government organisations particularly those are not ready yet. New e-Services announces via website and expos.

User access: The organisation offers around many e-Services as follows. E-Services offers to government sectors including all health procurement required. Also, the organisation offers health transportation and procurement e-Services provided to private sectors. The organisation offers self services to employees via ERP (SAP). the organisation does not offer any e-Services to citizens because the type of business not required to do so. The website portal and direct support from public relation department are available for public to represent their feedback. Currently only employees are able to access hier documents online.

"Yesser": The e-Government strategy which adopted by "Yesser" is not clear so that led to high resistance by government organisations. *""Yesser" should play an*

affective role by involving them self in adoption and diffusion of e-Government projects across government sector." Also, "Yesser" should have power to force government sectors to strategies and help them to implement proposed projects. The organisation is connecting to neither Government Security Network (GSN) nor Government Service Bus which are offered by "Yesser". The organisation offers all e-Services via their own website portal.

Portal: *"The organisation portal contains all the organisation's e-Services offered even it covers only %30 of all e-Services should be offered. This due to lack of other e-Government organisations readiness that need to be connected to."*. The best characterises of provision of the organisation's government e-Services is two-way interaction possible. The quality of the organisation 's website regarding the availability, accessibility, connection speed, update, content and is good (about %75).

Business processes: *"Since the organisation just established few years ago, it was easy to implement best practise solutions and advanced applications.*". The main ICT applications projects have been implemented at the organisation are core business (Supplier Relation Management –SRM), ERP (SAP), CRM, EDI,we-based application, EAI, enterprise portal and e-recruitment. The organisation's average (out of 7) of internal capacity to pursue the following information management activities are high: Produce information = 6, Gather information = 6, Digitize Information = 5, Process information = 7, Analyze information = 6, Distribute information = 6, Public access to information = 7, and Archive information = 6.

ICT infrastructure: all hardware, software and connectivity is highly developed Some ICT infrastructure projects have been implemented since the organisation established which are data centre, network, VM ware and security (including internal policy).

"The only problem I see with e-Government is security. Online laws and legislations are not complete even worldwide because it's hard to detect who committed the crime as there are many ways to hide one's identity and location. Technology advances in both ways, in security and in hacking also."

E-Services help desk is available through the call centre. The organisation has an operation section as well. The organisation's average (out of 7) of internal capacity is satisfactory however hardware and technical support are high as following: Quality of software applications = 5, Quality of connectivity (WAN & LAN) = 6, Quality of ICT security = 6, Quality of hardware = 7, and Quality of technical support = 7.

Human resources: Although all of the employees have IT skills there is shortage in the number qualified people. The organisation offers training courses internally for all new applications implemented. Also, there are electronic guide to explain how applications work. IT department has been developed a help desk internally.
The policy makers, department managers, section managers and users have a good level of awareness of the benefits of e-Government so that ease the implementation of IT projects.

As for the importance of the seven dimensions in affecting e-Government readiness, strategy ranks first as a corner stone in the success of any project, followed by good ICT infrastructure. Next, the right processes, followed by the ICT architecture (portal). Human resources involved in the project are the fifth factor, followed by the user access, and finally "Yesser".

E-Government Overview

It will take time for e-Government in particular to be grasped and used widely in Saudi Arabia. The organisation is expected to be %001 ready for e-Government after five years. However, the e-Government readiness progress over Saudi Arabia is slow only few sectors are attempting to achieve a good level of it.

The main factors expect to affect the e-Readiness and make some government organisations are more ready than others in the adoption and diffusion of e-Government organisations in Saudi Arabia are:

- Lack of leaders and decision makers support
- Lack of fund
- Lack of qualified people
- how big organisation size is
- how much interaction with citizens.

Many barriers were faced in the adoption of online services as follows:

- ICT communication barriers some areas
- bureaucracy
- lack of qualified staff
- lack of good IT implementers
- lack of PMO role at organisation and country level.

Interview Fourteen

Interviewee: Information Technology Manager

Strategy: The organisation, by way of its objectives, policies and projects included in this strategy, seeks to accomplish a promising future vision; namely, delivering best-quality integrated and comprehensive healthcare services.

"The organisation has set a strategy, taking into consideration all the elements that would achieve the future vision in line with the development accomplished in health services sector around the world. In addition, the strategy is consistent with the roles played by the organisation; the assigned authority to provide health e-Services to the citizens, in addition to its responsibility of oversight and supervision of private sector facilities, as well as the development of legislation, rules and regulations for the provision of healthcare e-Services to the citizens and residents of the Kingdom of Saudi Arabia."

The organisation has created a e-Government steering committee but it is not effective.*"The organisation has created a five years strategy in order to adopt and diffuse e-Government initiative, it was a high delay in preparing it. The strategy only before two years started to put plans. This delay effects the progress of e-Government organisational readiness in offering e-Services.".*

Due to lack of qualified staff, the strategy included hiring outsourcing people by third party agent (maintenance and operation project – self operation). Also, it included new ICT infrastructure projects to fast the organisation e-Readiness. The operation plan assesses the strategy project performance by timeframe and project manager. Funds do not cause a problem, provided by the Ministry of Finance. The assistant minister for planning and development is recently prepared a plan for change management across the organisation. New e-Services announce via website.

User access: The organisation has two thousand three hundred and fifty (2,350) hospitals and health centres, also around one hundred and twenty thousand (120,000) employees. The organisation is not offering G2C e-Services so far. However, the organisation offers only one G2G e-Services which is health insurance validity (query) by direct connection to Ministry of Interior. Seven (7) G2B e-Services offer

lately on the website such as searching medical certificates. The organisation offer also four (4) G2E e-Services for querying personal information. All e-Services are queries and offer on the website as the solely delivery channel. There is no chance for public to provide feedback. Users are not able to access documents online. *"The e-Services that have the most impacts on citizens and organisations will be introduced first to achieve positive first impression via multi ways such as website, ATM, call centre and mobile."*.

"Yesser": Regarding "Yesser" performance, based on the huge budget they got form the Ministry of Finance and easiness that provided by the government, unfortunately the performance is frustrated. *"The main reason that causes the low of performance is that "Yesser" waiting government organisations to ask them for help. The best way is to force organisations to move towards e-Government and assist them in preparing strategies and plans and connected to their sharing systems."*. Also, "Yesser" should help public sectors in hiring qualified people by forcing the Ministry of Civil Service to change the old hiring systems. The organisation is connected to "Yesser" for only getting some details to offer the medical certificate service. The GSB offered and GSN offered by "Yesser" is not effective due to the limited services and long procedures. The organisation is not offering any e-Services on Saudi National Portal.

Portal: The organisation lately developed a new website portal but all the e-Services offered are basic queries. The best characterises of provision of the organisation's government e-Services is no e-Services available. The usage of the website in the two languages provided: Arabic and English (only informative). "*The quality of* the organisation*'s website is not satisfactory regarding the availability, accessibility, connection speed, update, content, and e-Services that led to clear indication of the low readiness of e-Government."*.

Business processes: *"The organisation be aware of the advantages of BPR lately and has developed a plan for re-engineering business processes with streamline and portfolios and currently under implementation.". The main ICT application project has been implemented at the organisation is ERP. For core business, there is a plan to implement Health Information System (HIS).".*

The organisation's average (out of 7) of internal capacity is very low to pursue the following information management activities: Produce information = 3, Gather information = 2, Digitize Information = 2, Process information = 2, Analyze information = 2, Distribute information = 2, Public access to information = 2, and Archive information = 1.

ICT infrastructure: *"The lack of ICT infrastructure is one of the major barriers to the growth of the organisation capabilities to provide e-Services and transactions.*". There are three hundred hospitals and around two thousands health canter did offer proper e-Services due to the weak ICT infrastructure. The hardware quality is in average but not enough to provide high quality e-Services and the software as well. However, recently the external connectivity is getting better be using (Voice Over Network) VPN technology. There is a plan to develop and improve the LANs and WANs across the ministry. So that caused a delay in implementing some e-Government services. There is Internet connectivity internally but no official. The IT security solution is only applying firewalls, however there is an absence of polices and rules. User technical support only operate during working hours. The organisation's average (out of 7) of internal capacity is modest to pursue the following: Quality of software applications = 4, Quality of connectivity (WAN & LAN) = 4, Quality of ICT security = 3, Quality of hardware = 6, and Quality of technical support = 4.

Human resources: "*The lack of qualified IT people is effecting the organisation to operate all activities required so that caused a delay in e-Government adoption and diffusion."*.

Few years ago the organisation sent many employees to a special IT training institute to attend ICDL courses. Currently many employees be allowed to attend a list of IT training courses at Institute of Public Administration (IPA). Although completing IT training courses is not enough for employees if they did not involved in daily work and projects.

Recently the organisation has established user technical support department . But, a Service Level agreement such as customer service satisfaction is not available so far

due to an absent of e-Services. The policy makers, department and sections managers, and users have low level of awareness of the benefits of e-Government.

"We need to set roles and responsibilities and increase IT awareness in the organisation for long term benefits.".

The strategy is considered the most important dimension of e-Government readiness success, followed by the ICT infrastructure and human resources. Then processes dimension ranks fourth before ICT architecture (portal) that comes as the fifth factor. Then user access and finally "Yesser" dimension.

E-Government Overview

"There is a delay and lack of all seven factors mentioned at the organisation that led to low e-Government readiness.". Also, of the progress of e-Government readiness in Saudi Arabia is slow. For next five years the progress will getting better for both the organisation and Saudi Arabia but still will be not satisfactory, only few advanced government organisations will be %100 ready.

The main factor expect to affect the e-Readiness and make some government organisations are more ready than others in the adoption and diffusion of e-Government organisations in Saudi Arabia are:

- Availability of motivated leadership
- availability of qualified IT managers
- availability of fund.

Many barriers were faced in the adoption of online services as follows:

- Lack of clear national e-Government strategy from "Yesser"
- Lack of qualified people due to high demand on private sectors
- Limitation of IT training courses
- lack of good government project system that provided by Ministry of Finance.

Interview Fifteen

Interviewee: Business Development Manager – E-Services
(This interview covers the e-Readiness of e-Government for both "Yesser" and over all government organisations in Saudi Arabia)

Strategy: The Government of Saudi Arabia attaches high significance to the e-Government concept and the transformation process that leads to its realization. It strongly believes in the huge benefits such concept of e-Government entails for the national economy. Accordingly, the supreme Royal Decree number. 7/B/33181, dated 10/7/1424 (7/9/2003) included a directive to the Ministry of Communications and Information Technology to formulate a plan for providing government services and transactions electronically.

"Yesser" received SR3.0000.000.000 (AUD 800.000.000) fund from Ministry of Finance when its established in 2005. Transformation to an information society cannot be achieved without comprehensive collaboration and concerted efforts to realize the set objectives. Therefore, the Ministry of Communications and Information Technology (MCIT) established the e-Government Program in 2005 in conjunction with the Ministry of Finance and the Communication and Information Technology Commission (CITC).

"The Steering Committee is formed by the Supreme Supervisory Committee and headed by His Excellency the Governor of the Communications and Information Technology Commission." It includes the following members:

- Representatives of the Ministries of Finance, Communications and Information Technology, and the Communications and Information Technology Commission.
- The e-Government Program Director.
- The secretariat of this committee manages the e-Government Program.
    - Execution of strategic resolutions issued by the Supreem Supervisory Committee and development of the necessary directive programs to implement these resolutions.
    - Completion of preparatory tasks for the Supreem Supervisory Committee.
    - Reporting on necessary topics and recommendations to the Supreem Supervisory Committee for approval.
    - Direct supervision of the program's administrative tasks.
    - Preparation of detailed work plans.

- Prepare e-Government projects, submit them to the Supreem Supervisory Committee and follow up their implementation.
- Identify priorities and formulate policies, standards, frameworks and procedures for e-Government projects.
- Evaluation of the efforts exerted by government and private sector organisations relevant to the e-Government Program.

The first work plan the e-Government program executed over a five-year period through two parallel tracks. The first track is expected to continue for a maximum of two years, while the second track lasts for the full five-year. "*There are some succeed stories in the first work plan such as building Saudi National Portal, Government Security Network (GSN) and Government Service Bus (GSB)."* The second work plan started at end of 2010. Recently "Yesser" also fund ICT government organisation projects. *""Yesser" assesses organisations readiness but this does not reflect the real situations due to many issues such as lack of comprehensive framework also government organisations are always reluctant to reveal any negative attitude when responding to "Yesser" measurement surveys , and especially towards issues related to their work environment."*
""Yesser" has no power to force organisation to move toward e-Government initiative." There is no change management. "Yesser" announces new e-Services via e-Government national government organisations website, and sometimes brochures.

User access: The total of e-Services available on the Saudi national portal is around eight hundred (800) but the majority only queries. *"Unfortunately the integration between "Yesser" and other government organisations is low and not satisfactory.*" "Yesser" does not has delivery channels (only email) and relations with organisations only provide support sometimes. All the stakeholders can provide their feedback on "Yesser" website portal. Only some documents can stakeholders access online such as strategy, work plan and new decisions. *"The delivery channels and e-Services offer to the users over most of government organisations is under average and need more work to achieve user's expectations."*

Portal: "Yesser" does not offer any e-Services on "Yesser"'s website portal. *"The availability and accessibility of e-Government transactions via the portal is a barrier to most of organisations projects.*" The best characterizes the provision of the "Yesser"'s government e-Services is two-way interaction possible, however complete

transaction possible within single agency over all government organisations in Saudi Arabia. *"Yesser already applied IBM WebSphere Portal and SOA suite in order to integrate different IT platforms (application and database) and that included in the GSB.". "The quality of "Yesser"'s website regarding the availability, accessibility, content, e-Services, update, and connection speed is good even there is a lack of e-Services, however for most of government organisations is not satisfactory. This affected negatively the e-Government organisations readiness."*

Business processes: *""Yesser" applied Business Processes Re-engineering (BPR) tool on deferent levels. The main ICT applications projects have implemented in "Yesser" are the portal, GSN, GSB and digital certificates.*" The "Yesser"'s and over all organisation's average (out of 7) internal capacity to pursue the following information management activities is the same: Produce information = 4, Gather information = 5, Digitize Information = 3, Process information = 3, Analyze information = 2, Distribute information = 3, Public access to information = 4, and Archive information = 4.

ICT infrastructure: "*Since 'Yesser" has advanced IT technology, ICT infrastructure is not one of the major barriers to the growth of 'Yesser"'s capabilities to provide e-Services and transactions, however it is an obstacle for many government organisations to be ready for e-Government".* There is intranet connectivity and digital interaction between all departments. "Yesser" have a good ICT security solutions and policies however most of government organisations have but no regular updates and upgrades. *"Day to day operation and maintenance are essential for any IT department to resolve daily issues.".* "Yesser"'s average (out of 7) internal capacity to pursue the following is high: Quality of software applications = 5, Quality of connectivity (WAN & LAN) = 6, Quality of ICT security = 6, Quality of hardware = 7, and Quality of technical support = 6. But, for all government organisations is modest falling between 4 and 5.

Human resources: *"Human resources is the main barrier that hold back e-Government development and implementation.*". It is difficult to improve employees computer skills that could help them with new working technology. Also, finding qualified people to be involved in the project causes another problem. *"There is a*

lack of numbers of qualified employees due to the old and limited recruitment system which provided by Ministry of Civil Service that cause a high turn over to the private sector.". "*In this regard "Yesser" has been coordinated with Ministry of Civil Service to provide six months IT certified training courses the target is ninety thousand (90.000) employees in deferent government organisations."*. There is no help desk at "Yesser" because of very low demand but most government organisations have. *"The level of awareness of the benefits of e-Government in "Yesser" for the policy makers, department and section managers is excellent, however for the other government organisations is low so that has a high impact on their e-Readiness."*.

Regarding the seven dimensions affecting e-Government readiness, strategy ranks first, followed by ICT infrastructure, ICT architecture (portal), human resources, processes, "Yesser" and finally user access.

E-Government Overview

The progress of "Yesser" in helping implementing e-Government in Saudi Arabia is good also the progress of overall organisations is good but still require a lot of work in order to achieve the strategy vision and goals.

The major barriers expect to affect the e-Readiness and make some government organisations are more ready than others in the adoption and diffusion of e-Government organisations in Saudi Arabia are:

- Lack of e-Government understanding of decision makers.
- Lack of qualified people.
- Lack or re-engineering processes.
- Law of IT employee salary compared to the private sector.
- Lack of good ICT project implementers.

Dr. Robert Goodwin
Senior Lecturer in School of Computer Science, Engineering and Mathematics
Room (358), Information Science & Technology Building

GPO Box 2100
Adelaide SA 5001

Tel: (+61 8) 8201 3113
Fax: (+61 8) 8201 2904
Email:
Robert.goodwin@flinders.edu.au
http://csem.flinders.edu.au/

Appendix 6: Letter of Introduction (Questionnaire English version)

Dear Sir/Madam,

This letter is to introduce **Mr. Ibrahim Alghamdi** who is a government official in the Real Estate Development Fund in Saudi Arabia and currently a PhD student in the School of Computer Science, Engineering and Mathematics at Flinders University in Australia.

He is undertaking research leading to the production of a thesis or other publications on the subject of "E-Government Framework for Assessing Organisational E-Readiness in Developing Countries: A Case Study of Saudi Arabia".
He would be most grateful if you would volunteer to assist in this project, by completing this questionnaire which covers certain aspects of this topic. This questionnaire aims to investigate organisational and technological requirements that will be necessary for the adoption of e-Government to resolve the delay of e-Readiness in public sector organisations.

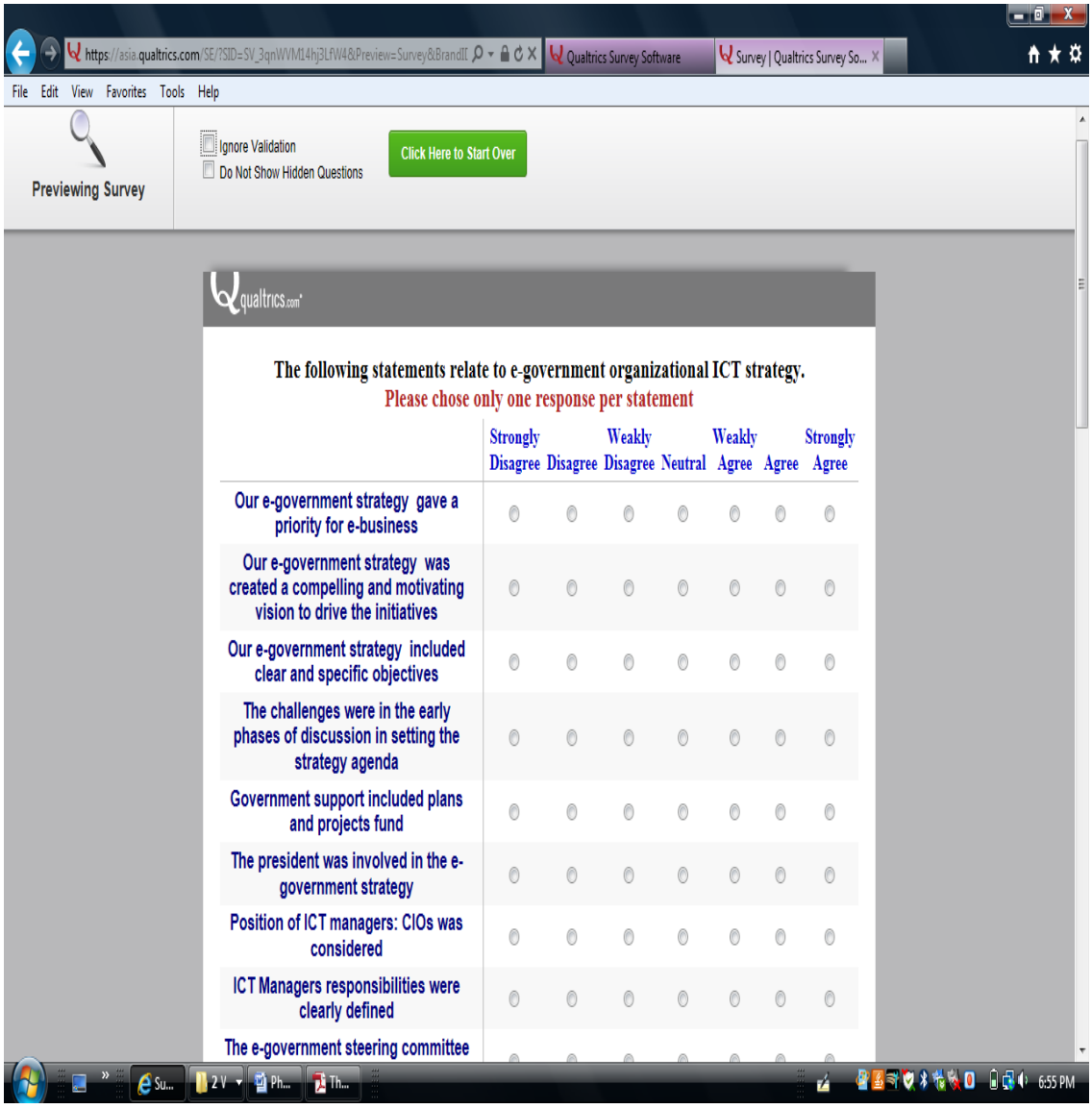
If you are interested you will be requested to complete an 11-page questionnaire. This questionnaire will not take more than one hour of your time to complete it. A summary of the results will be sent by email to interested respondents.

Be assured that any information provided will be treated in the strictest confidence and none of the participants will be individually identifiable in the resulting thesis, report or other publications. You are, of course, entirely free to discontinue your participation at any time or to decline to answer particular questions.
Any enquiries you may have concerning this project should be directed to me at the address given above or by telephone on (+61 8) 8201 3113, by fax on (+61 8) 8201 2904 or by email to (Robert.goodwin@flinders.edu.au).
Thank you for your attention and assistance.
Yours sincerely
Dr. Robert Goodwin
Senior Lecturer
School of Computer Science, Engineering and Mathematics - University of Flinders, Australia

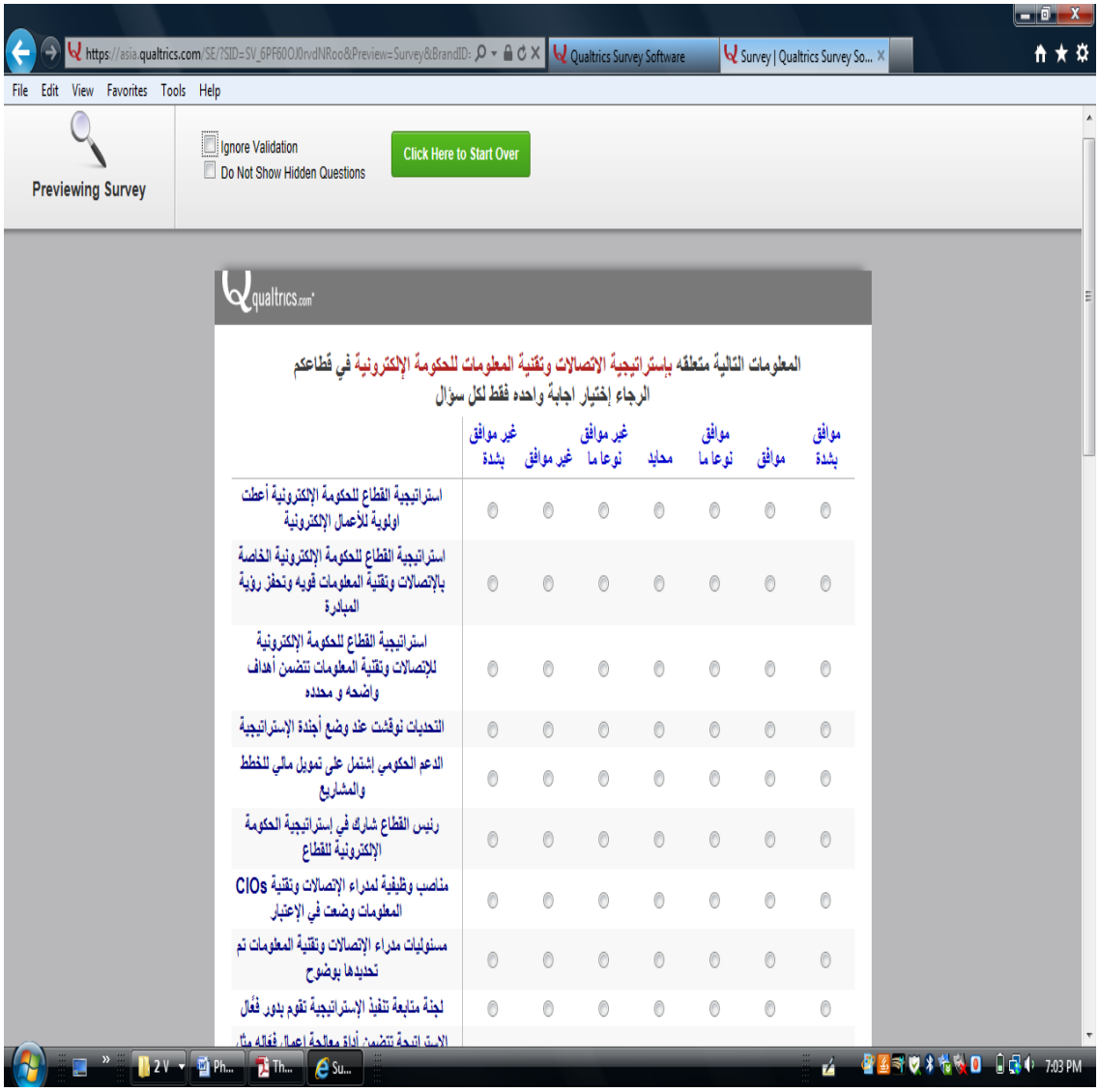
*This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number : **5338**). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on (+61 8) 8201 3116, by fax on (+61 8) 8201 2035 or by email human.researchethics@flinders.edu.au.*

Appendix 7: Online Questionnaire (English Version)

Note: For readability, only a screenshot of one of the pages will be included. The other pages of the questionnaire will be displayed in Word format rather than the online display. This is also justified given the inability to view the entire webpage at once as some of the content could only be viewed by scrolling.



Appendix 8: Online Questionnaire (Arabic Version)



Appendix 9: Questionnaire (English Version)

1- Background Information (please answer the following questions)

s.	Item	Answer
1	How many employees are in your organisation?	
2	How many manual and automatic services does your organisation offer?	
3	How many Governments to Citizens (G2C) e-Services does your organisation offer?	
4	How many Government to Government (G2G) e-Services does your organisation offer?	
5	How many Government to Business (G2B) e-Services does your organisation offer?	
6	How many Government to Employees (G2E) e-Services does your organisation offer?	
7	How many branches does your organisation have?	

The following statements relate to e-Government organisational readiness. Please circle **only one response per statement**.

1 = Very Unlikely 2 = Unlikely 3 = Weakly Unlikely 4 = Neutral
5 = Weakly Likely 6 = Likely 7 = Very Likely

	Very Unlikely						Very Likely
I felt that my organisation is ready for e-Government.	1	2	3	4	5	6	7

2- E-Government Organisational Strategy

The following statements relate to e-Government organisational ICT strategy. Please circle **only one response per statement**.

1 = Strongly Disagree 2 = Disagree 3 = Weakly Disagree 4 = Neutral
5 = Weakly Agree 6 = Agree 7 = Strongly Agree

		Strongly Disagree						Strongly Agree
A1	Our e-Government strategy gave a priority for e-business.	1	2	3	4	5	6	7
A2	Our e-Government strategy was created a compelling and motivating vision to drive the initiatives.	1	2	3	4	5	6	7
A3	Our e-Government strategy included clear and specific objectives.	1	2	3	4	5	6	7
A4	The challenges were in the early phases of discussion in setting the strategy agenda.	1	2	3	4	5	6	7
A5	The legislation was written down in detail.	1	2	3	4	5	6	7
A6	The president was involved in the e-Government strategy.	1	2	3	4	5	6	7
A7	The e-Government steering committee was effective.	1	2	3	4	5	6	7
A8	ICT specialists involvement were clearly defined.	1	2	3	4	5	6	7

B1	The strategy action plan mainly focused on the customers e-Services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B2	Managing resource allocation of e-Government throughout the organisation was considered.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B3	The strategy action plan involved accountability.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B4	The strategy action plan involved IT Policies and Procedures.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B5	The stakeholder's roles were clearly defined in the strategy action plan.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B6	The strategy included effective business process tools such as Business Processes Re-engineering (BPR) to improve and develop the organisation procedures to match user's requirements.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B7	The timeframe for implementing the strategy plan was well defined with milestones.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B8	The fund resources were one of the major parts of the action plan.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B9	The structure of the strategy action plan was well defined.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C1	The strategy included delivery channels plan for user access.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C2	The strategy ensured the integrity of organisations ICT systems with the e-Government program "Yesser".	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C3	The strategy involved ICT architecture which refers to the fundamental technological architecture of an e-Government portal.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C4	The strategy included effective suitable ICT applications/systems for e-Government.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C5	The strategy involved a plan to establish a suitable ICT infrastructure to support information systems and applications that are essential for e-Government.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C6	The strategy study included some important issues relative to human resources allocation to achieve the organisation's e-Government goals.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C7	The Media channels used to announce the new e-Services included TV, Radio, SMS and Newspapers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

3- User Access

The following statements relate to the user access to e-Services. Please circle **only one response per statement**.

Using the following scale, please indicate in your view the level of **e-Services which your organisation offers compared to the total of the same kind of services (Automatic and Manual)**. Please **circle one percentage** (%) figure. 0% indicates the lowest level of e-Services, and 100% the highest level.											
G2C e-Services as % of all **G2C** services (Automatic and Manual)	**0%**	**10%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**	**100%**
G2G e-Services as % of all **G2G** services (Automatic and Manual)	**0%**	**10%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**	**100%**
G2B e-Services as %											

of all **G2B** services (Automatic and Manual)	**0%**	**10%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**	**100%**
G2E e-Services as % of all **G2E** services (Automatic and Manual)	**0%**	**10%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**	**100%**

The following statements relate to users access (delivery channels). Please circle **only one response per statement**.

1 = Strongly Disagree 2 = Disagree 3 = Weakly Disagree 4 = Neutral
5 = Weakly Agree 6 = Agree 7 = Strongly Agree

		Strongly Disagree						**Strongly Agree**
A1	One of the most important delivery channels for e-Services we offered was the web site.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A2	Automated Teller Machines (ATMs) were common and effective delivery channels used by the organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A3	Our delivery channels for e-Services involved PCs and Laptops.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A4	Mobile phones (WAP) were effective delivery channels for e-Services offered by the organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A5	The organisation offered a call centre as a delivery channel for e-Services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A6	Kiosks offered as a delivery channel for e-Services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

4- E-Government Program "Yesser"

The following statements relate to the compatibility with the e-Services with the e-Government program "Yesser". Please circle **only one response per statement**.

1 = Strongly Disagree 2 = Disagree 3 = Weakly Disagree 4 = Neutral
5 = Weakly Agree 6 = Agree 7 = Strongly Agree

		Strongly Disagree						**Strongly Agree**
A1	Our organisation ICT systems are compatible with the e-Government program "Yesser" Single-Sign-On portal.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A2	Our organisation exchanges information with "Yesser" via email, CD, DVD, ...	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A3	There is a clash in roles and responsibilities between Yesser and ALALEM in helping providing e-Services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A4	Our organisation exchanges information with "Yesser" via a direct connectivity.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A5	Our organisation offers a sufficient number of e-Services through the "Yesser" portal > 50% of the organisation services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B1	The connectivity between the organisation systems and Government Service Network (GSN) offered by "Yesser" was completed successfully.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B2	No connectivity with GSN because of lack of coordination from Yesser.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C1	The connectivity between the organisation systems and							

	Government Service Bus (GSB) offered by "Yesser" was completed successfully.	**1 2 3 4 5 6 7**
C2	The GSB offers common e-Services (For example, identity management, e-payment core data exchange).	**1 2 3 4 5 6 7**
C3	No connectivity with GSB because of lack of coordination from Yesser.	**1 2 3 4 5 6 7**

5- Portal Architecture

The following statements relate to quality of ICT architecture of portal. Please circle **only one response per statement**.

1 = Strongly Disagree 2 = Disagree 3 = Weakly Disagree 4 = Neutral
5 = Weakly Agree 6 = Agree 7 = Strongly Agree

		Strongly Disagree						**Strongly Agree**
Regarding the organisation **Website quality**, please rate the following:								
A1	Using of Single-Sign-On (SSO).	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A2	Availability.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A3	Usability.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A4	Layout.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A5	Navigation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A6	Consistency.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A7	All information available on the Website.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B1	The communication standard used for the portal such as IP/VPN, Leased line, Frame relay is effective**.**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B2	The contents of our website portal are updated regularly.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B3	The proportion of **partially automated** services offered on the organisation portal are sufficient (> 60%) compared to all services (Automatic and Manual).	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B4	The proportion of **fully automated** services offered on the organisation portal are sufficient (> 60%) compared to all services (Automatic and Manual).	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B5	Our organisation selected suitable and reputed operating systems such as Linux, Unix, Windows Server to install on the portal servers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B6	Our website portal uses a high level of software technology from popular vendors such as Microsoft SharePoint (MOSS), Oracle Portal, WebSphere Portal (IBM) and has the potential to other entities.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B7	The connectivity speed for the portal is sufficient (> 4 Mbps)**.**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C1	The portal provided complete transaction within single organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C2	The portal provided two-way interaction.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C3	The portal provided complete transaction across multiple agencies.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C4	The portal able to deal with multiple kinds of databases.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C5	Organisation implemented Service Oriented Architecture (SOA) such as Oracle SOA Suit, Microsoft BizTalk to increase compatibility and reduce coding.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

6- Processes

The following statements relate to business processes and information systems. Please circle **only one response per statement**.

1 = Strongly Disagree 2 = Disagree 3 = Weakly Disagree 4 = Neutral
5 = Weakly Agree 6 = Agree 7 = Strongly Agree

		Strongly Disagree						**Strongly Agree**
A1	There are motives or pressure points behind supporting business processes.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A2	The focal areas of process change were determined.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A3	The organisation reengineered business processes (all service procedures workflow).	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A4	Business processes were documented.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A5	The organisation is highly collaborative with other public agencies in the solution of problems, service delivery, or better work flow.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A6	The organisation has a strong integration of business processes between departments.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A7	There is a direction to streamline business processes.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A8	Complete portfolio of support functionalities security, e-payment, and DMS is offered by systems accessed from all major business processes.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B1	Core business applications that are specifically used by one government organisation were developed.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B2	The ERP implemented included all or most of the following modules: HR, Payroll, Financial, Procurement, Communication management, Work flow management, Maintenance System, Project management.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B3	Enterprise Application Integration (EAI) was implemented to overcome some of the limitations of ERP.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B4	A Customer Relationship Management (CRM) application was implemented for focusing on customer retention and relationship development.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B5	Electronic Data Interchange (EDI) designed to exchange documents between organisations was implemented.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B6	Web services are standards-based, suited and were built with common infrastructure in our organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B7	All systems are supported by applications.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Regarding the **quality of data and information flow** provided by the organisation, please rate the following:								
C1	Content	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C2	Accuracy	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C3	Timeliness	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C4	Convenience	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C5	The following tools were implemented for data entry by users: Barcode Readers, The Website Portal, and other Self Service Devices.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C6	The organisation's software applications can share data throughout the organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C7	Advanced databases such as Oracle, MySQL, SQL server,	**1**	**2**	**3**	**4**	**5**	**6**	**7**

	and DB2 were implemented in the organisation using a DBMS and fully integrated.	
C8	SMS is used to notify the customers.	**1 2 3 4 5 6 7**
C9	The organisation's web site is used to offer e-Services and notify the customers.	**1 2 3 4 5 6 7**
C10	Email is used to notify the customers.	**1 2 3 4 5 6 7**
C11	Please rate the **overall quality of data and information flow** provided by the organisation IT.	**1 2 3 4 5 6 7**

Using the following scale, in your view please indicate the level of **services based on their automation offered to Citizens, Governments, Businesses, and Employees**. Please **circle one percentage** (%) figure. 0% indicates the lowest level of e-Services, and 100% the highest level.											
The proportion of services fully automated	**0%**	**10%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**	**100%**
The proportion of services partially automated	**0%**	**10%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**	**100%**
The proportion of services not automated	**0%**	**10%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**	**100%**

7- ICT Infrastructure

The following statements relate to ICT infrastructure. Please circle **only one response per statement**.

1 = Strongly Disagree 2 = Disagree 3 = Weakly Disagree 4 = Neutral
5 = Weakly Agree 6 = Agree 7 = Strongly Agree

		Strongly Disagree						**Strongly Agree**
Regarding **quality of hardware** in the organisation, please rate the following:								
A1	Proportion of desktop users within the organisation is sufficient (> 80%).	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A2	Compatibility with other departments in the organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A3	Compatibility with other agencies.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A4	Use of hardware standards: Local/National/International was identified.							
A5	Please rate **overall quality of the hardware** in the organisation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Regarding **quality of software** in the organisation, please rate the following:								
A6	Reliability.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A7	Ease of use.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A8	Accessibility.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A9	Usefulness.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A10	Flexibility.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A11	Suitable and reputed operating systems were installed on the applications and databases servers such as Linux, Unix, and Windows Server.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A12	Use of software standards: Local/National/International was	**1**	**2**	**3**	**4**	**5**	**6**	**7**

	identified.	
A13	Please rate **overall quality of the software** in the organisation.	**1 2 3 4 5 6 7**
B1	ICT communication network was easily accessed.	**1 2 3 4 5 6 7**
B2	The coverage of Local Area Network (LAN) over the organisation is sufficient (> 80%).	**1 2 3 4 5 6 7**
B3	The coverage of Wide Area Network (WAN) over the organisation's branches and customers is sufficient (> 80%).	**1 2 3 4 5 6 7**
B4	Proportion of Internet users within the organisation is sufficient (> 80%).	**1 2 3 4 5 6 7**
B5	Proportion of the employee's access to PCs through the home is sufficient (> 5%).	**1 2 3 4 5 6 7**
B6	Rural areas have Internet connections.	**1 2 3 4 5 6 7**
B7	Percentage of users who have dedicated or other high-speed >4Mbps digital access to the Internet is sufficient (> 50%).	**1 2 3 4 5 6 7**
B8	VoIP technology helped in saving calls cost.	**1 2 3 4 5 6 7**
C1	ICT security policies applied in the organisation resulted in a secure environment.	**1 2 3 4 5 6 7**
C2	The organisation implemented an ICT security awareness program in the ICT security project.	**1 2 3 4 5 6 7**
C3	Regular ICT security assessment tools are properly applied to discover vulnerabilities.	**1 2 3 4 5 6 7**
C4	User's authentication is used to organise monitor and protect user access.	**1 2 3 4 5 6 7**
C5	User's authorization is used to protect the ICT network and information.	**1 2 3 4 5 6 7**
C6	Encryption tools are properly applied to protect information.	**1 2 3 4 5 6 7**
D1	Our organisation properly applied an ICT day to day work plan (including back up, user support etc...) to guarantee high performance.	**1 2 3 4 5 6 7**
D2	ICT staffs ensure that providing technical support to the users.	**1 2 3 4 5 6 7**
D3	IT staff ensure that all ICT hardware and software redundancy resulted in high availability.	**1 2 3 4 5 6 7**
D4	IT staff ensure that the ICT Disaster Recovery (DR) system is tested regularly.	**1 2 3 4 5 6 7**
D5	IT staff ensure that updating and upgrading all the ICT systems regularly.	**1 2 3 4 5 6 7**

8- Human Resources

The following statements relate to human resources. Please circle **only one response per statement**.

1 = Strongly Disagree 2 = Disagree 3 = Weakly Disagree 4 = Neutral
5 = Weakly Agree 6 = Agree 7 = Strongly Agree

		Strongly Disagree						Strongly Agree
A1	There are resistance to technological change either within the organisation or among clients.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A2	Employees understand the move towards e-Government, and what are their roles and expectations.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A3	The ICT department is well respected by middle and low management.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A4	E-Government impacts on employees.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
A5	The organisation adopts to change employees.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B1	ICT/IT director/manager has bachelor or above degree in a computer field.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B2	ICT personnel held accountable for achieving the organisation's e-Government goals.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B3	The jobs that require IT skills were sufficient.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B4	Our organisation has enough qualified IT staff.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B5	The technical experience and expertise of our e-Government teams (internal or partner) is adequate for success.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C1	The organisation provides incentives that attract and retain qualified, highly ICT skilled personnel and encourage superior performance.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C2	ICT Assistance training, such as a help desk, provided to that meet customer needs.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C3	The proportion of employees who have International Computer Drive License (ICDL) or/and Internet and Computing Core Certification (IC3) are sufficient to deal with IT systems.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C4	Methods, tools or training is provided to assist individuals who lack the ICT skills or have special requirements for accessing electronic services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C5	Training and support keep personnel ICT skill sets current with e-Government developments.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C6	The maintenance department/section received well training to be able to respond to all maintenance requests.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

9- Organisational E-Government readiness

The following statements relate to e-Government organisational readiness. Please circle **only one response per statement**.

1 = Extremely Unready 2 = Unready 3 = Weakly Unready 4 = Neutral
5 = Weakly Ready 6 = Ready 7 = Extremely Ready

	Extremely Unready						**Extremely Ready**
Please indicate the level of which your organisation has achieved e-Government readiness.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

The following statements relate to e-Government organisational readiness. Please circle **only one response per statement**.

1 = Very Unacceptable 2 = Unacceptable 3 = Weakly Unacceptable 4 = Neutral 5 = Weakly Acceptable 6 = Acceptable 7 = Very Acceptable

	Very Unacceptable						**Very Acceptable**
I felt that my organisation is ready for e-Government.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

If you feel there are other issues, which were not listed in the above tables and are pertinent to Saudi's case, please feel free to list them and indicate why you see them relevant?

……
……
……
……
……
……**Your Details**

Name: .....
Position:.....
Organisation:.....
Organisation's website: .....
Email: .....
City: .....

Thank you so much for your time and assistance,,,

If you have any enquiries, please do not hesitate to contact me by email to algh0044@flinders.edu.au

Ibrahim Alghamdi