An Investigation of Readiness Assessments For E-government Information System and Cloud Computing Using Saudi Arabia as a Case Study

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ABSTRACT

In the on-going ICT world revolution, e-government applications are considered as one of the modern, growing, and important applications delivered over the Internet. These applications, enabling citizens to interact with government, have emerged in recent years, and are likely to have a positive impact on citizens, government, business and society. It is known that e-government is a new concept. Therefore, much effort is needed in achieving its prime objectives assessment strategies for both the public and private sectors.

In this context, new technologies provide several benefits to government over traditional technologies. The literature review, completed by the researcher, indicated that there is a gap between practice and theory identified by the absence of a comprehensive assessment framework for e-government systems and readiness. Most of the assessment frameworks, reviewed for the study, are varied in terms of philosophies, objectives, methodologies, approaches. This implies that there is no assessment framework that is likely to cover all e-government readiness aspects.

This research proposed to develop a comprehensive framework of associated guidelines and tools to support e-government Information Systems Readiness (EGISR) and Cloud Computing. The developed framework contains the internal as well as external factors affecting e-government readiness and has been categorised into four main layers namely i.e. technology readiness, organisation readiness, people/stakeholders readiness, and environment readiness. It is important to mention that the developed framework has been empirically tested and validated in a real environment taken the Kingdom of Saudi Arabia as a case study, surveying 600 citizens, 125 staff, and 25 officials. This research is one of the first studies in the Arab world which has focused on these three samples/perspectives and Cloud Computing.

The finalised framework provides a comprehensive structure for the e-government readiness assessment process and Cloud Computing to help decision makers, in government, in setting up vision and a strategic action plan for the future of e-government. In addition it identities key elements and stages needed to implement such action plans. We believe that the assessment framework establishes an appropriate tool to assess e-government readiness. It can also be used as an effecting evaluation framework to determine the degree of progress already made, by government organisations, towards e-government implementation and maintenance.

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DEDICATION

To My Mother, who prays for me, and taught me that even the hardest work can be accomplished if it is done one step at a time.

To My Sweetheart, the love of my life my wife Abeer, your unlimited love, patience, warm encouragement support and helped me to completion of this work. You have been with me every step of the way, through good and bad times. Also to our flowers, my beautiful daughters my little angels, Lana and Eliana, your shining smile makes my day.

LIST OF PUBLICATIONS

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2. **Kurdi, R.** and Randles, M. (2012) "Factors Influencing Citizens to Use E-government Services: Saudi Arabia as a Case Study*". In the Proceedings of The 6th Saudi* ***Scientific International Conference,*** UK. Available at: http://issuu.com/aahariri/docs/sic2012proceedings

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4. **Kurdi, R.** and Randles, M. (2012) "Factors Influencing Citizens to Use E-government Services: Saudi Arabia as a Case Study". In *Proceedings of the 6th Saudi Scientific International Conference, Brunel, UK.* Available at*: http://issuu.com/aahariri/docs/sic2012proceedings*

5. **Kurdi, R**., Taleb-Bendiab, A., Randles, M., and Taylor, M. (2011) "E-Government Information Systems and Cloud Computing (Readiness and Analysis)". *In the Proceedings of The fourth International Conference on Developments in E-systems Engineering (DeSE),* pp.404-409. Dubai.

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1.1 Introduction

The fast pace of change and the rapid evolving of stakeholders' requirements in the use of government services has forced governments to improve or develop new methods to deliver their services. Thus, a widespread uptake of e-government applications has emerged as a major factor in government interaction with the stakeholders and there is wide scope for further adoption over the coming years. Moreover, the e-government wave seems to present a significant opportunity to improving government services by providing such services over the Internet. Furthermore, it is quite evident that most of governments in both the developed and developing countries recognise the importance of e-government to their countries.

E-government, as a concept, has created a lot of interest among researchers in the information systems field where the adoption of e-government leads to dramatic changes in the relationships between Government and Citizen (G-to-C), Government and Business (G-to-B), and Government and Government (G-to-G) as well as Government and Employee (G-to-E).

The benefit of e-government services over traditional government services can be evaluated by increased speed and efficiency, 24 hour service, lower processing costs, quick adjustment to government services situations, and the ability to deal with citizens directly instead of through intermediaries.

Nevertheless, the transition of e-government systems is not an easy operation. Many technical and non-technical issues must be tackled and considered in the adoption and dissemination of e-government. The investment in both technology and human capital for implementing e-government, in the public sector, is a major aspect of a government's action plan for cross-disciplinary IT development and its e-readiness, generally, for next generation government administration. The migration of e-government tools and practices into public sector organisations is changing the methods of governments' interaction and increasingly moving to delivering information and services electronically which leads to the use of technology to enable the delivery of government services.

In this context, by analysing current research in the field of e-government, it can be observed that there are limitations for the use of e-government services, and there are many issues facing e-government adoption. The recently completed literature review by the researcher indicated that there is a gap between practice and theory identified by the absence of a

comprehensive assessment framework for e-government systems and readiness in both the public and private sectors. Most of the assessment frameworks, reviewed in this study are varied in terms of objectives, philosophies, approaches, methodologies, and results. This implies that there is no assessment framework that is likely to cover all e-government readiness aspects. Therefore, this study aims to develop a comprehensive multi-layers framework of associated guidelines and tools to support e-government Information Systems (EGIS) readiness provisioning model. In addition, the proposed framework aims to provide a method to guide the assessment of EGIS readiness, including assessing the degree of maturity of a considered e-government system. This work is intended to complement on-going e-government initiatives in the field, taking the perspective of citizens and officials, as well as staff. The outcomes ought to aid authorities to understand the key issues that influence the implementation of e-government systems and their organisational readiness.

This chapter provides an introduction to the research undertaken within this thesis which aims to give the reader an overview and background of the selected area of this research, and will be followed by a clear statement of the problem, research aims and objectives, research questions, research motivation, research process/methodology in Brief, research contributions to knowledge and the structure of the thesis. Finally, a summary of the chapter is given.

1.2 Problem Statement

Due to the potential of ICTs in encouraging and seeking economic growth and development at diffident level such as citizens', business, and government, many governments around the world have been endeavouring to transform and improve their services' provision and collaborative relationships with the private sector companies and their citizens via the introduction of e-government services. Moreover, ICTs are defined as: *"technical systems that accept, manipulate, and process information and facilitate communication between at least two parties"* (Hilbert and Katz, 2003: 14). Based on UN e-government development index report (2012), a survey of 193 worldwide countries confirms that 190 of countries had online services. Based on the United Nations (UN) global index for E-government development many developing countries are below the average of e-government development index (0.4882) (UN, 2012). However, the success of such ambition requires a careful systemic design, implementation and review, taking into account both readiness of the duty holders and challenges that can slow down the implementation of e-government services. It also requires a comprehensive strategy that is not only benchmarked on global best practices,

but is also sensitive to existing economic and political conditions and realities. For e-government to be a reality, governments, in consultation with stakeholders, should follow a common strategic framework, which provides the government's vision, milestones and targets, technical approach and standards for e-government systems. Such a framework should also address information security, privacy, maintenance, and interface standards. As a result of the literature review and the researcher's work in this field, it is observed that there are many significant issues facing the adoption of e-government systems. It is true that most governments are looking towards developing in many technological fields, but the limitations of e-government uptake and use are evident. One of the main issues is the readiness, of governments, for e-government: Up until now there are no comprehensive assessment methods to assess e-government readiness. This has motivated this work in identifying an urgent need of developing a comprehensive readiness assessment method to be used in developing countries. The assessment readiness framework developed for this research will cover four layers which are as follows: Layer (I) technology readiness, layer (II) organisation readiness, layer (III) people/stakeholders readiness, and layer (IV) environment readiness. In addition, the developed framework also provides an associated guideline to help government leaders' plan and addressing the lack of such tools.

1.3 Saudi Arabia and E-Government

The government of the Kingdom of Saudi Arabia (K.S.A) started improving services in the public organisations in order to achieve and reach high standard of electronic services. Based on the United Nations reports, the development of e-government services in the KSA has been increased from year 2005 to 2012. In 2005 e-government development index was at 0.4105 and ranked 80 worldwide (UN, 2008). In 2008, e-government development index was at 0.4935 and ranked ten places higher at 70. However, most recently in 2012 the index was at 0.6658 (world average is 0.4882) but KSA ranked 41 worldwide and 9th in Asia (UN, 2012). This imply that Saudi Arabia made a good performance and progress, but there is still more work required for it to become a leader in the Asia or globally. (More details about this performance and efforts are in Chapter (3).

1.4 Scope of the Research

Rapid development of ICT has delivered several opportunities for a government. This rapid development illustrates that e-government is one of the new developing research focuses in the field of Information systems (IS) which has been classified as an issue of high importance

for all governments around the world. Thus, there is a need of an appropriate study that offers guidelines for government leaders to assist them to understand the requirements on how to assess e-government system readiness. It is in view of that, the scope of the research is broadly based on the areas of e-government information systems readiness with Saudi Arabia as the research focus, in order to enhance as well as support the government delivering their services on the Internet. The main reason for focusing on the SA is that, at present, there is minimal research emphasising the efforts of KSA; particularly, examining issues such as e-government readiness and adoption.

1.5 Research Aim and Objectives

In this research we have followed a systematic approach in addressing the known problem. In this context the detailed overview of aim and objectives is as follows.

1.5.1 Research Aim

At present, it is evident from the literature review that there are numerous issues facing the adoption of e-government systems: E-government readiness is one of the most important issues (Alateyah, et al 2013; UN, 2008). There is minimal support for comprehensive assessment methods for e-government readiness and most of the assessment frameworks, reviewed for this study, vary in terms of objectives, philosophies, approaches, methodologies, and results. Therefore, the life-cycle of the assessment process and the absence of a well-defined framework for e-government system readiness has not been expansively studied and analysed. The following, therefore, has been taken as the aim of this research:

To develop a comprehensive multi-layer assessment framework of associated guidelines and tools to evaluate E-government Information Systems Readiness (EGISR) and support their development.

1.5.2 Research Objectives

In order to achieve the research aim, the following objectives need to be met:

1. To investigate e-government phenomenon and related topics.
2. To establish the existence of development gaps within e-government through an extensive literature review.
3. To identify present weaknesses within e-government systems, particularly in developing countries, using Saudi Arabia as a real world case study.

4. To develop a multi-layer framework of associated guidelines and tools to provide a new approach for assessment of e-government readiness; this approach introduces a systematic method for assessment.
5. To test and validate the proposed framework using the Kingdom of Saudi Arabia as a case study.
6. To revise the developed framework based on the case study analysis with appropriate tools which will support E-Government Information Systems Readiness.
7. To identify those technical, organisational, and environmental factors which influence the e-government information systems readiness.
8. To provide suggestions and recommendations that can assist the government of Saudi Arabia to understand the key issues that influence the implementation of e-government and enhance the future development of e-government services in Saudi Arabia.

1.6 Research Questions

Based on the research aims and objectives in this research the following questions are addressed:

1. What are the technical, organisational and environmental factors that influence the readiness and the process of e-government systems in a real world environment?
2. What are the main requirements for assessing e-government readiness?
3. How can a full benefit be gained from new technology to support E-government System and be further harnessed to build an effective environment to deliver better services?

1.7 Research Motivation

The absence of a well-defined framework for e-government readiness, incorporating any systematic approach to design, led to the research focus in this area. Thus the motivation for this research is to reach a better understanding of e-government systems readiness and tan evaluation of the real situation of e-government in particular instances. This research therefore investigates these issues through a study of e-government systems and readiness. Moreover, this has led to the development of a framework for assessing e-government

systems and readiness by determining critical factors that influence the adoption, and identifying the factors that could hinder governments in the introduction of e-government.

1.8 Research Process/Methodology

Much of this research is informed by data collection, from a field study located in Saudi Arabia. In practice, data can be collected from numerous sources using either qualitative or quantitative methods. The research methodology followed in this work is a combination of both quantitative and qualitative methods. Questionnaires and interviews are designed to collect data with open-and-closed ended questions to obtain both quantitative and qualitative data for analysis.

To evaluate the readiness and maturity of e-government services in the Kingdom of Saudi Arabia, a survey is designed to assess the current state of e-government as-is and to collect the citizens, officials, and staff perspectives regarding e-government services, whilst investigating the critical factors influencing the adoption of e-government services and determining the factors that could prevent governments advancing to e-government.

Consequently, an initial pilot study was conducted for one month and involved 40 students (20 males and 20 females) studying in the UK representing citizens of KSA to answer the questionnaire and to give their comments about the questionnaire in term of the structure and the layout, the length of the questionnaire, the language, clarity of the questions and the sequence of questions. On the other hand, a sample of 10 staff/employees from Saudi Embassy in UK was selected to complete a similar task. The pilot interviews were handed out by the researcher to 10 government officials from three different government organisations in Saudi Arabia these organisations are: Directorate General of Civil Status (DGCS), Directorate General of Traffic Services (DGTS), Directorate General of Passport and Residence (DGPR). The reasons for the selection of these organisations is based on three different contexts namely levels of interaction (G-to-G, G-to-B, G-to-C), Organisation structure (small, medium, large), Maturity level of e-government readiness. These three public organisations have a big customer base and provide important services to the society. The final research involved 600 citizens, 125 staff, and 25 officials in the Kingdom of Saudi Arabia.

1.9 Research Contributions to Knowledge

In order to address the void in the literature regarding e-government adoption and assessment, and develop an assessment framework that outlines the implementation and assessment process in both developed and developing countries, the outcomes of this research includes the following contribution:

- ***A comprehensive multi-layer assessment framework for e-government systems readiness.***

This work will report on the development of a complete assessment methodology, to assess e-government systems readiness, which provides comprehensive guidelines and tools in an analytical framework. These guidelines and tools are intended to assist government leaders during the implementation process and assess the state of e-government systems readiness.

This assessment framework has four principal requirements/contributions:

1. It should be easy to understand and use.
2. It ought to provide all the features necessary to provide a systematic approach to assess the readiness level of e-government systems.
3. The framework should have multiple purposes such as;
    a. Establishing comprehensive architecture guidelines, beyond the purely analytical dimension of an e-government readiness assessment.
    b. Providing a checklist for the current state of the system; what has been implemented and what is still required, which can easily be turned into a measurement tool for the readiness level of the government organisations.
4. This framework should be used as a monitoring tool for government leaders to provide an overarching holistic view of e-government in any particular environment.

This framework aims to reduce the complexities of the assessment process for e-government by understanding the assessment process, identifying the main requirements of ICT tools, organisation, and highlighting the importance of the stakeholders-people readiness as well as the impact of the environment readiness. Furthermore, the framework, developed in this research, can also help decision makers to set a vision and strategic statement action plan for the future of e-government by identifying key factors and stages for action.

1.10 Structure of the Thesis

The overall structure of this thesis consists of seven integrated chapters in which each one discusses a specific issue linked to the research. The flow of the research is illustrated in the next section summarises and explains the importance of each of these chapters.

Chapter One: Introduction to the Study

This chapter aims to give the reader an overview and background of the selected area of this research. It focuses on: The statement of the problem, research aims and objectives, research questions, research motivation, research process/methodology in brief, research contributions to knowledge, and the structure of the thesis.

Chapter Two: Review of the Related Literature

This chapter aims to introduce the first part of the literature review addressing the state of art in e-government in terms of: definitions and perspectives. The reviewed literature, in this chapter, is an endeavour to better understands the benefits and challenges of adopting e-government. Subsequently, the literature reviewed covers the current situation of e-government around the world with an appraisal of best practice and the critical factors influencing its adoption and implementation within the context of developing countries and in Saudi Arabia.

Chapter Three: The Kingdom of Saudi Arabia (Case Study)

This chapter aims to introduce the second part of the literature review, by focusing on Saudi Arabia as a field/case study or environment of application. In order to provide a context and application environment, for this work, the general characteristics of the Kingdom of Saudi Arabia are discussed. This includes a profile of Saudi Arabia from geographical, location, population, culture and society, and economic status perspectives. In this chapter a comparative study between the proposed case study (Saudi Arabia) and the UAE, which has a similar socioeconomic profile and is an advance developed country in the Gulf region, is presented to discuss special requirements to promote enhanced e-government structures within the Kingdom of Saudi Arabia.

Chapter Four: Research Methodology and Data Analysis

This chapter aims to give the reader an overview and background about the selected research methodology which has been followed. It follows on from Chapters 2 and 3, which set the background for this research; identifying the research issues as well as developing the proposed framework. This chapter gives a comprehensive view of the research methodology

as well as an analysis of the survey and interview data. The chapter ends with a general conclusion of the need for a new system of e-government lifecycle process management.

Chapter Five: Description of the Proposed Multi-Layer Framework for Assessing E-government Information System (EGISR)

This chapter describes the proposed architecture, in a precise manner, based on the findings of the previous chapters.

Chapter Six: Analysis and Discussion

This chapter examines and highlights the features of the proposed architecture and provides a contribution to knowledge, which enhances understanding. It also analyses how the architecture would benefit and enhance the current efforts and situation already undertaken in Saudi Arabia through a case study.

Chapter Seven: Summary, Conclusions, and Recommendations

This chapter summarises and concludes the final outcomes from this research project. This includes the summary of research findings, contribution to knowledge and research novelty, and its limitations. Finally, this chapter provides recommendations for further research for success in assessing e-government and its associated opportunities.

1.11 Summary

The revolution in the use the information communication technology (ICT) has increased significantly the scope and opportunities for delivering government services. In fact, e-government applications are considered as one of the modern, growing, and important applications on the Internet in recent years, and that is due to its positive impact on citizens, government, business and society alike.

Reviewing the e-government and the KSA literature from different aspects and sources allows the researcher to conclude that although they are relatively new topics there are several successful endeavours by different people and organisations in Saudi Arabia. Due to that, this chapter introduces the background of the research project and explains the research problem, aims, objectives and main research questions to be answered and the structure of the thesis. The next chapter discusses details more of the theoretical foundations of this research study.

Chapter Two: Review of the Related Literature

2.1 Introduction

It is well known fact that the development of e-government services is important to a government's provision for its citizens and their social wellbeing. Through such efforts a better understanding, in meeting needs and creating opportunities for better public participation in government and transparency of processes, is achieved. This chapter endows with an overview and critique of the different areas that provided the theoretical fundamentals of the research. For this research, literature from numerous online academic citation databases was utilized, such as, Google Scholar, Web of Science as well as books. These sources were used as they provide intense information regarding a range of topics related with e-government services implementation and running.

2.2 Definition of an E-Government and Perspectives

There has been much argument among researchers regarding the definition of e-government. There are numerous definitions of e-government that exist in the published literature tending to reflect the researcher's specialisations and their interests. Moreover, all of them are attempting to explain the concept of e-government in the context of the Internet, in order to offer a broad range of services that enhances performance and interaction with the government (Helbig et al 2009; Chan et al 2010; and Krishnan et al 2013). In this section an organised comprehensive review and analysis is presented with respect to the various perspectives and aspects.

Public Administration

E-government is, most recently, defined as a public administration system using technology to make more efficient public management procedures and re-engineer business processes to improve the performance of public administrations (Pateli and Philippidou, 2011; Nograsek and Vintar, 2014). In addition, governments view the modern deployment of ICT as a new technique that could address the lack of coherency in delivering public services and improve efficiency (Chrysopoulou et al, 2013). Thus, the use of ICT in public administrations and its impact on public control has allowed governments to automate a broad range of internal functions and processes within public organisations and across organisational units: The overall goal is to provide high-quality services to all stakeholders.

Technology Perspective

E-Government has been identified as the use of information technologies with the capability to change relations with citizens, businesses, and government organisations (World bank, 2012). In (Welch, 2012), an explanation of e-government is suggested as an *"umbrella term for the use of information and communication technologies (ICTs) across a broad range of government activities such as electronic service delivery, integration and information provision, the support and improvement of public policies and government operations, and citizen engagement".* When viewing e-government from a technology perspective it is evident that the technology can improve transparency, enhance economic activity, reduce corruption, improve convenience, and reduce costs (Krishnan et al. 2013). In this context many researchers (Rowley, 2011; Reinwald and Kraemmergaard, 2012, Axelsson and Lindgren, 2013; Bwalya et al, 2014) have studied and examined the influence of e-government as a tool that could improve the relationship between governments and all stakeholders. On the other hand, some other researchers (Kavanaugh et al, 2012; Oliveira and Welch, 2013; Lee and Park, 2014) go further and investigate the roles of the social media as part of the technology to improve interaction between public stakeholders and the government. For instance (Hong, 2013) investigated how social media influences relationships between the public and government in terms of trust, indicating that the use of highly developed new technologies, such as social media, often increase public trust in interaction with the government.

On the Business Side

From a business view, E-government has been defined as the application of information and communication technology (ICT) to enhance, transform and/or redefine any form of resource and information exchange both transacting and contracting between involved actors, such as companies and governmental agencies and their clients, providers or other partners, by developing and maintaining dedicated inter-organisational systems, virtual organisational arrangements and international institutional arrangements (Wassenaar, 2000). In this definition the author focuses on e-government from a purely business perspective. In line with this perspective many researchers (Lee et al, 2011; Den Butter et al, 2012; Reddick and Roy, 2013; Arendsen et al, 2014) have investigated the same relation to enhance the interaction between government and businesses. For instance (Den Butter et al, 2012) explains a government's use of ICT as a solution to build trust-based regulation in the

government-to-business relationship with an authorised economic operator certification, using the tax and customs administrations in the Netherlands as a case study. They have discovered policy, reputation, and reliability to be major concerns in a trust-based interaction.

In summary, previous literature contains no universal or specific definition of e-government. In fact, the definition of e-government is subject to its association with technology which is changeable over time. However, definitions must necessarily include e-government flexibility of time and place and its interactive implementation. In other words encompassing most of the formerly discussed perspectives, e-government can be defined as, a process to convert traditional government transactions to electronic transactions using modern information communication technology to provide easy access to government services for all beneficiaries i.e. citizens, business, and government bodies to improve these services.

2.3 Classification of E-government Services

The adoption and implementation of e-government will successfully increase the capacity of government organisations interaction and communication at all the levels. The result of this adoption and implementation will create an effective online system for the government, which automates the delivery of government information and services as well as enhances methods of interaction within and between stakeholders and governments, (Concha et al, 2012; Maheshwari and Janssen, 2013).

The review of the literature indicates that there is debate between scholars about e-government categories: Some studies suggest that three categories of interaction are suitable to develop and improve government services with the stakeholders (Sharifi and Zarei, 2004; World Bank, 2007; Wang and Liao, 2008). These include Government-to-Citizen (G-C), Government-to-Business (G-B), and Government-to-Government (G-G). On the other hand, some scholars believe that four categories of interaction are appropriate to develop and enhance government services (Ndou 2004; Siau and Long, 2005; Mofleh et al, 2009), others recommended one additional category i.e. Government-to- Employees (G-E). Furthermore, (Montagna, 2005) believes that some more categories of interactions can be added to the above-mentioned types which are, G2NGO (Government to Non-Governmental Organisations) and G2NPO (Government to Non-Profit Organisations).

2.4 Life-Cycle of E-government (Models/Stages)

An evolutionary perspective where the information systems grow and evolve with acceptance, confidence, and resources is a common theme, with governments going through several stages before reaching maturity (Abdullaha et al, 2012). These approaches can be divided into concepts with a focus on aspects of development such as information portals, providing communication facilities, transaction process, and fully realising the integration of government systems (United Nation, 2005). Some scholars proposed three stage lifecycles whilst the World Bank (2002), and others believe that four stages are necessary (Layne and Lee, 2001). Five stages are proposed by (Moon, 2002), while (Deloitte, 2001) suggested six stages model.

More specifically the (United Nations, 2012) divides the implementation process of e-government into four stages namely: Stage (I): Emerging information services; this stage refers to the information available on government portal/website to offer stakeholder's necessary details such as types of services, regulations, and relevant documentation. Stage (II): Enhanced information services; this stage refers to a Portal/website capability to deliver one-way or a basic two-way communication between government and stakeholders. Stage (III); Transactional services: this stage refers to the portal/website's enhanced capability to provide two-way communication with government and stakeholders such as downloading/uploading forms, filing taxes online or applying for certificates or other activities that required face to face interaction. Stage (IV); Connected services: this stage refers to the portal/website ability to change the way that a government communicates with their stakeholders using Web 2.0 and other interactive tools.

In (Shareef et al, 2012) the model is based on six stages; (I) Initial (II) Information, (III) Enhancement, (IV) Interaction, (V) Transaction, (VI) Integration. The suggested model is based on both a technological and a public perspective, but primarily focuses on citizens' perspective. In this model there are two stages which make it different from other e-government stage models; these stages are the initial and enhancement stages. According to (Shareef et al, 2012) these two stages are very significant and are often ignored by many academic scholars or organisations.

All of the above models concurred on the major stages; information/publication, interaction, and transaction. This leads to the conclusion that e-government systems maturity must be based upon at least these three stages of maturity in order to be effective and meet its targets

2.5 Benefits of E-government Adoption and Implementation

Benefits for Citizens

Benedetti et al, 2009; point out that the purpose of e-government is to realise the delivery of public services in a much more convenient, and cost-effective way. They suggest that the main benefits of e-government to citizens are: (1) Cost savings; the opportunity to use the same service with a reduced effort. (2) Time savings; the opportunity to reduce the time spent by the citizen with flexible access points. (3) Different multichannel accessibility; the opportunity to access government on-line channels using different devices. (4) Transparency; the opportunity for the citizens to follow and monitor transactions online. In addition many researchers have attempted to investigate the value of the implementation and adoptions of e-government and the interaction between government organisations and the citizens' acceptance for these new methods. (Jaeger and Bertot, 2010; Osman et al, 2011; Reddick and Turner, 2012; Tan, 2013; and Russo et al, 2014).

Benefits for Businesses

New technology has transformed the way businesses operate. Regarding the benefit of e-government adoption for businesses, some studies (Lee and Ahn, 2011; Reddick and Roy, 2013) indicate that the adoption of e-government will produce more business opportunities with the government. Moreover, it will also enhance the quality of services for government and business sectors, in terms of convenience, cost-effectiveness and e-procurement (Li et al ,2013). Thus, adoption of e-government systems will enhance government services for business, and simplify the marketing process and supply chain management (Arendsen et al, 2014).

Benefits for the Government Organisations/Public Sector

New working methods of delivering services such as e-government offer many potential benefits for the internal business of the government. It includes gaining efficiency and effectiveness or better use and management of information. Intranet technologies offer the possibility of establishing knowledge bases and cross-departmental working. Extranets on the other hand, connects organisations, and through the use of extranets, government departments can enable business to be carried out more quickly and cheaply. According to the Office of Management and Budget (OMB, 2012) using online services between government organisations and departments will be more accurate and powerful than traditional methods

of service delivery. Therefore, it will improve government organisations' performance. In addition (Xin Lu et al, 2011; Luna-Reyes et al, 2012; Bigdeli et al, 2013; Cavalheiro and Joia, 2014), examined the roles and value of using e-government systems and they highlight the performance and information sharing between multi-level departments. They recommended that availability and organisational trust has a key role in the process of information sharing.

As a result of the above classification, e-government systems ought to provide better delivery of services to citizens, business, and government. Its successful implementation will enhance the quality of services and the interactions with the stakeholders' (citizens, business, and government). It can support faster processing and response to citizen's needs and expectations. Thereby reducing operations cost of service delivery and communications between government and citizens, business and employees, whilst increasing the organisation's productivity.

2.6 Barriers and Challenges of E-government Adoption and Implementation

It is known that, though e-government may have many promises, there are still some challenges. The literature review suggests that implementing e-government can be excessively complicated. E-government implementation will have different stages with various technical, organisational and social challenges. According to (Stoltzfus, 2005) hosting e-government is costly and has multiple requirements of established technical infrastructure, an established political system, and highly skilled people.

(Alshehri and Drew, 2010) identified the barriers and challenges that affect the implementing of e-government projects as follow; IT infrastructural weakness, lack of knowledge about the e-government programme, lack of security and privacy of information, lack of qualified personnel and training courses , culture differences, leaders and management support, lack of policy and regulation for e-usage, lack of partnership and collaboration, lack of strategic plans, resistance to change to e-systems, and shortage of financial resources. Therefore, e-government still has a big gap to reach advance stages (Asogwa, 2013). In the following section the barriers and challenges of e-government are examined in the context of three concerns: (I) Technological barriers and challenges, (II) Organisational barriers and challenges, and (III) Environment and Social barriers and challenges.

Technological Barriers and Challenges

Technology is an important factor in the implementation of e-government. Benefits such as efficiency, electronic service delivery and cost-effective services cannot be fully achieved if there is a technical barrier. This is why the many failures, or poor performance, in e-government systems and services, are often attributed to inadequate design and poor technical interoperability. However, adoption of technology remains as one of the main challenges for both developed as well as developing countries. ICT can be seen as the bedrock for e-government technology. This includes: the Internet, web-technologies, telecommunication, networks connectivity and capacity, databases, hardware equipment, and software applications. ICT technology that shapes e-government has even more requirements; it needs interoperability, compatibility, security and reliability (AL-Shehry, 2008).

According to (Rana et al, 2013) lack of technological infrastructure is the key challenge that adversely affects the implementation of any IT project. He commented that the successful implementation of e-government needs a strong and full technology infrastructure. Furthermore, the implementation of e-government depends on the structured capacities of infrastructures and capitalisation with an integrated focus. Some other studies concluded that the lack of appropriate infrastructures, such as insufficient hardware and software, and network coverage presents a significant challenge for adoption and implementation (Lee and Berry 2011). Some studies also highlighted additional issues such as security and privacy as having a significant impact on implementing e-government (Alomari, 2012; and El-Haddadeh, 2013). For the purpose of this study, technology is identified as ICT infrastructure i.e. hardware and software, Network infrastructure, security infrastructure to exchange data and IS infrastructure i.e. information quality, system quality, and services quality.

Organisational Barriers and Challenges

The existing introduction of ICT has led to fundamental changes in the way public organisations perform their activities. Therefore, more researchers are investigating the organisational aspects and examining their influence on technology adoption. The existing literature shows that a high number of e-government initiatives, in different types of organisation, fail or do not achieve their goals due to a number of reasons. These reasons are: lack of executives and top managers' commitment, employees' resistance to change, lack of skills and training programs, lack of awareness and conceptual understanding and old and inflexible management systems (AL-Shehry, 2008; and Schein, 2010). Moreover, for any IT

project to be successful the support from top management is required at all levels. However, in terms of public organisations or government organisations, it is clearly apparent from the literature review that this is not an easy task and most government IT projects fail due to many issues such as lack of clear strategy and planning, resistance to change, BPR, etc. (Zeleti and Uusitalo, 2013; Nograšek and Vintar, 2014). Based on that, in this research the focus on the organisation factors include organisation structure, culture, size, strategy and vision and interaction, which affect strategy and planning issues i.e. leadership support, IS strategy, funding/budget, BPR, legislation, and data sharing and personnel challenges such as training and development, staff motivation.

Environment and Social Barriers and Challenges

It is evident from the above discussion that barriers and challenges arise from demographic characteristics, country profile, social/cultural, political, and economic considerations. The digital divide gap, which is related to the social environment, is also a significant challenge that influences e-government in term of adoption and use. From a social and economic perspective, (Be´langer and Carter, 2009) investigated a group of American citizens from different backgrounds and found that income, education, age, and Internet use were the main factors affecting citizens' intentions to use e-government services. On the other hand (Zhao and Deng, 2014) study the effects of the digital divide on e-government such as economic, social, political, demographic, and cultural aspects and found that the significant point for both the digital divide and e-government are complex, dynamic, and multifaceted phenomena and need a full understanding of the digital divide when the government attempts to implement e-government systems. Based on, for instance, the lack of knowledge and skills to use computers and/or the high cost of accessing the Internet, this will reflect negatively on the adoption of e-government. Nevertheless, within Saudi Arabia as the case study (AlGhamdi et al, 2011) indicated, the implementation of e-government in Saudi Arabia needs a clear vision and a detailed strategic plan for e-government to be successful. One other major relevant work by (Alateyah et al, 2013), investigated the barriers and challenges that affect e-government implementation in Saudi Arabia and concluded that quality of service, diffusion of innovation, computer and information literacy, culture, lack of awareness, technical infrastructure, website design, and security, effect the intention to adopt E-government services in Saudi Arabia.

2.7 E-government Best Practice

Increasing the access to ICT has encouraged many governments around the world to integrate new technology into their development strategies. It is becoming a more and more important public service tool for many governmental organisations and the extent of activity on the part of public sectors in leveraging IT has increased in volume. The majority of public organisations around the world have now established online websites and provide their services to the community (UN, 2012). In the past it was not easy to examine e-government development in both the developed and developing countries.

This section describes e-government development in several more advanced countries. It begins by presenting experiences from advanced nations and then moves to projects in the Arab world. The definitive aim is to identify issues and lessons that may assist e-government implementation and dissemination and assessment of development strategies used.

According to (UN, 2012) the Republic of Korea, the Netherlands, and the United Kingdom are the world e-government Development leaders in 2012.

E-Government in Republic of Korea

E-government implementation in the Republic of Korea has become established through several development phases. It originally began between 1987-1992 with the automation of various tasks, such as the launch of an administrative database. From 1993-2000, the Republic of Korea started the second phase with information development and delivering a services information system. From 2001- 2002 the Republic of Korea created the e-government infrastructure. From 2003-2007 around 31 e-government schemes were introduced. the Republic of Korea's vision for e-government was very realistic considering its existing IT infrastructure. In 2011 the Republic of Korea introduced a new strategy implementation plan called "Smart Government", which covers the period from 2011 until 2015. The main objectives of this plan are; to lead the world as the best mobile, safe and person focussed e-government, system. Smart work aimed at balancing professional and personal lives, providing communication-based customised service to citizens, and e-government infrastructure with sound foundations (The Korean Association for Policy, 2012). Since 2000 as a result of Republic of Korea great efforts to improve e-government it is now recognised as having the world's best e-government, as indicated by the UN's assessment of e-government development; the Republic of Korea is ranked no.1 in the assessment, (UN, 2012).

E-Government in the Netherlands

Since 1994, the Netherlands has been striving to obtain a leading position in E-government. In 1994, the ministry of Economy introduced the first National Program called "National Program Electronic Highways" this program suggested a framework for the different initiatives which were based upon six essential points to support and give the Netherlands a leading position in the area of ICT. Moreover, the Ministry of Internal Affairs introduced another Program called the "OL2000 project" The key objective of this project was to improve public services by supporting the municipalities in providing their services. In May 2008, the Netherlands government set up an e-government strategy that covered five primary areas; e-Skills, e-government, interoperability and standards, ICT and public domains, and Services innovation and ICT. The National Implementation Programme (NIP) became the Netherlands' e-government strategy until 2011, focusing on the infrastructure and related projects that use such infrastructure. In November 2011, the Netherlands introduced a National Implementation Programme Called "I-NUP" up until 2015, which included three sets of strategies; A One-Stop-Shop for citizens, digital services for businesses, and a system of 13 basic key registers, (European Union 2011). As a result of the Netherlands efforts to improve e-government it is ranked as no.2 in the world (UN, 2012) for e-government.

E-Government in the UK

In 1994, the Central Computer and Telecommunications Agency (CCTA), under the responsibility of the "Cabinet Office", launched a central government website called ('open.gov.uk') since that time the UK Government has been working hard to set up the main requirements for e-government. In 2000, the UK Government set the first e-government official strategy called "e-government a strategic framework for public services in the Information Age". The target of this strategy was to have all services available for the public online by 2005. This strategy challenged all public sector organisations to innovate and committed all central government departments to the transformation of public activities through applied e-business methods, (European Union, 2011). Based on this strategy by December 2000, the UK government launched its portal called "UKonline.gov.uk" to provide a one-stop-shop for public services online. Furthermore, the UK government in 2011 introduced a new government ICT Strategy (Cabinet Office, 2011) covering the period between 2011-2013. This strategy focused on a government cloud, government ICT

capability and government end user devices. As a result of the UK is ranked at no.3 in the world for e-government in the UN assessment (UN 2012).

E-government in United Arab Emirates

The United Arab Emirates has recognised the importance and the value of e-government as a tool to ensure the success of its development plans, for conversion towards a knowledge-based economy and to improve the government sector. The UAE started some of its e-services, such as eDirham, in early 2001, (Al-Khouri, 2012). This service, introduced by the Ministry of Finance, changes the traditional method of paying and collecting fees for government services. In November 2002, the United Arab Emirates set-up the e-government programme committee in the UAE. By March 2003 the e-government strategy was consulting in partnership with IBM to conduct an evaluation study and to develop an executive plan. Moreover in 2005 the UAE launched the first portal for e-government. In 2010 UAE developed the third foundational element for a government service development strategy under the control of the office of the prime minister. The UAE introduced another strategy for e-government called "eGovernment Strategy 2012-2014, this strategy covered three dimensions: (1) The Environment dimension; which covers a set of factors such as the infrastructure and regulatory policies that affect the growth of the ICT sector in the UAE, and in particular the use of the outputs of this sector in the government sector. (2) The Readiness dimension; which aims to measures the ability of federal government agencies in the UAE in terms of technology, organisation and human resources to use ICT outputs and their ability to transform towards e-government. (3) The Usage dimension which focuses on having the federal agencies to provide their services to the various categories of customers through electronic channels (UAE E-government Strategy, 2012).

The purpose of this section was to identify and analyse the best practices and initiatives of e-government implementation through which the researcher will present the formulation of a particular e-government framework for Saudi Arabia. Notably, these countries have recognised the significance of ICT in the improvement of government efficiency and effectiveness and governments' responsiveness to the citizens.

In this context for the preparation of e-government, these countries have implemented task forces or teams to set up a unified Web portal that relies on integration of different services and close co-operation of different government authorities and levels of government. In terms of delivery for e-government services, these countries have adopted customer relationship

management principles that have resulted in a more customer-oriented delivery of e-government services.

Based on the above discussion it has been found that a strategy and vision for establishing e-government infrastructure is the first step required followed by the integrated involvement of key personnel (senior management). These are the main keys to drive the development of e-government. This is evident in all the three top countries in the last e-government assessment report by (UN, 2012). The assessment conducted by UNDESA rates e-government performance based on 1- Online Service 2-Telec Infrastructure, 3 Human Capital. On the other hand, UAE's long term vision and efforts to improve e-government since 2001, has moved UAE forward in e-government development in GCC, and ranked it as no.28 in the UN assessment (UN 2012).

2.8 Discussion

As a result of the foregoing reviews e-government has become a vital issue in various developing countries particularly in Saudi Arabia, where the achievements of the human subject are enabled by the various human sciences to achieve their aspirations and visions of the future. IT provides significant opportunity for the government to improve the delivery of information and services as a new wave in IT evolution: e-government presents a tremendous impetus to move forward in the 21st century with higher quality, and cost-effective government services as well as providing a better relationship between citizens and government. (AlAwadhi and Morris, 2009; Alshehri and Drew, 2010; Khan et al, 2010; and Lee et al, 2011). Arguably, however, the success of such ambition requires a careful systemic design, implementation and review taking into account willingness of both the duty holders as well as barriers and challenges that slows down the implementation of e-government initiatives (Lee et al, 2011; Rajapakse et al, 2012; Asogwa, 2013; Al Mourad and Kamoun, 2013). For e-government to be a reality, governments, in consultation with stakeholders, should follow a common state strategic framework, which establishes the government's vision, targets and the approach for e-government systems, (Rajapakse et al, ,2012; Asogwa, 2013). It is true that all governments are looking to develop in many technological fields, but the limitation of using e government can be observed, particularly in Saudi Arabia. As a result of the literature review there are many significant issues facing the adoption of e-government systems and the notable differences in the level of dissemination and adoption between developed and developing countries (Lee et al, 2011; Rajapakse et al, 2012;

Asogwa, 2013; Al Mourad and Kamoun, 2013; Rana et al, 2013; Abodohoui et al, 2014; Alomari et al, 2014). As a consequence of this contrast and based on the reviewed literature, the researcher categorised the issues affecting the adoption of e-government into the three categories: Technological barriers and challenges, (II) Organisational barriers and challenges, and (III) Environment and social barriers and challenges. Likewise, the complexity of these challenges is higher in developing countries such as Saudi Arabia.

2.9 Summary

In this chapter an overview and background for the State-of-the-Art of e-government Information systems has been compiled and finalised, introducing definitions of e-government. It has included a description of e-government classification, the life-cycle of e-government (Models/Stages), the benefits and barriers and challenges of e-government adoption and implementation in developed and developing countries. This chapter ended with an examination of the current challenges recognised in the literature review also categorising the gap to extend the acceptance of e-government adoption, and usage in developing countries. It is positioned for a better understanding of the challenges that obstruct successful e-government implementation, as well as addressing several opportunities to enhance government efficiency and effectiveness. Furthermore, the researcher reviewed the web portal of the government of United Kingdom, UAE and the web portal of the government of Saudi Arabia to compare the services existing via e-government platform using the driving license and renewal service as an example to find out the e-government online services maturity and process through different e-government platforms. More details about these finding will be discussed in the next chapter.

Chapter Three: A Comparative Study

3.1 Introduction

This chapter introduces and discusses a comparative study between Saudi Arabia as a developing country and other countries having the same social economic profile. For this comparative study the UAE has been selected due to its resemblance in many aspects to Saudi Arabia. In this chapter, attention will be paid to additional requirements, for Saudi Arabia, that might occur in implementation of the proposed model. The rest of this chapter is organised as follows. In section 2 a general profile of both Saudi Arabia and UAE is given. In section 3 an overview of the technology acceptance model is presented to facilitate greater understanding of the introduction of new technologies in general and e-government (in Saudi Arabia) in particular. Section 4 focuses on the comparative study. A discussion covering the outcomes of the comparative study is given in section 5, while the summary is presented in section 6.

3.2 A General Profile of both Saudi Arabia and UAE

Saudi Arabia and the United Arab Emirates are very similar in a number of aspects such as culture, economic, and in sharing the same traditions. However the way the countries are managed and the way of life are also fundamentally different in many ways. In this section a general profile of Saudi Arabia and UAE will be presented. According to the Central Deportment of Statistical and Information, KSA (CDSI, 2014), the population of Saudi Arabia was approximately 29,994,272 in March 2014, including about 8,429,401 non-nationals. The average annual growth rate of population was estimated at 3.2% in March 2014. In comparison to the UAE, the total population is approximately 8,264,070 including 7,316,070 non-nationals, according to National Bureau of Statistics.

Today, Saudi Arabia's economic status is growing fast as witnessed by a great transformation in many aspects of the inhabitants' economic life. The country has transitioned to a modern economy, led by the petroleum and petrochemical sectors. According to the world factbook, the economy in the kingdom of Saudi Arabia is based on oil, which is reflected in the petroleum sector accounting for roughly 80% of budget revenues, 90% of export earnings and 45% of GDP. Increasingly the government of Saudi Arabia is promoting foreign investment by establishing six "economic cities" in different regions of the country and has a plan to

spend $373 billion between 2010 and 2014 on social development and infrastructure projects to further improve Saudi Arabia's economic growth.

On the other hand, the government of the United Arab Emirates (UAE) began to develop the services in public organisations in order to accomplish a high standard of electronic services (ADSIC, 2009). Based on the United Nations reports, the development of e-government services in the UAE augmented from the year 2005 to 2012. In 2005 e-government development index was at 0.571 and ranked 42 worldwide (UN, 2008). In 2008, e-government development index was at 0.631 and ranked ten places higher at 32 and most recently in 2012 the index was at 0.734 (world average is 0.488) but UAE ranked 28 worldwide and 5th in Asia (UN, 2012).

3.3 E-government Project (Initiative) in the Kingdom of Saudi Arabia

The Kingdom of Saudi Arabia is passing through stages of change and development, and e-government is one of the most important social and economic development mechanisms, giving a high priority to e-government development and the transformation process. Based on this vision, a 2003 Royal Decree directive was issued to the Ministry of Communications and Information Technology (MCIT, 2014) to design and develop a plan to transfer traditional government services and transactions to the Web via the Internet (E-government Program, 2010). Therefore, in 2005 the Ministry of Communications and Information Technology (MCIT), in conjunction with the Ministry of Finance and the Communication and Information Technology Commission (CITC), established the E-Government Program, called Yesser. According to (Yesser, 2006) the main objectives of the E-Government Program in Saudi Arabia are: (1) To raise the public sector's productivity and efficiency. (2) To provide better and more easy-to-use services for individual and business customers. (3) To increase return on investment (ROI), and (4) to provide the required information in a timely and highly accurate fashion. The main idea behind Yesser is to enable the implementation of an e-government programme between government organisations, ensuring the minimum level of coordination and centralisation in e-government implementation. In order to meet the set targets for the e-government program in Saudi Arabia, Yesser has two staged action plans and strategies;

The First Action Plan (2006-2010)

According to Yesser, the e-government initiative in Saudi Arabia focuses on providing better government services to the stakeholders/users such as; individuals, businesses and government organisations. This calls for a user-centric approach and charges the government, in the first action plan (2006-2010), to provide better services to all stakeholders/users. In order to achieve the above vision the following objectives were set: (1) Provide better services by the end of 2010, (2) Increase internal efficiency and effectiveness, and (3) Contribute to country's prosperity.

The Second Action Plan (2012 – 2016)

Based on the achievements of the First Action Plan (2006-2010), Yesser developed the Second Action Plan (2012–2016) in collaboration with others such as universities, private sector companies and representatives of the general public in Saudi Arabia. Therefore, it appears that the focus of the government/Yesser, in the second action plan (2012-2016), is on government organisations and stakeholders/users to provide better services to all stakeholders/users.

In order to achieve this vision the following objectives have been set: (1) To build a sustainable e-government workforce, (2) To improve the experience of the public in their interaction with government, (3) To develop a culture of collaboration and innovation, and (4) To improve government efficiency. Furthermore, to achieve the above vision and objectives sixty four initiatives has been set divided into six categories (1) Human capital, communication and change management: This category aims to ensure the availability of leadership as well as human resources and communication in order to complete the Second Action Plan. (2) E-services: This category looks at three Components of the e-services including: availability, maturity and utilization. (3) Shared National Applications: This category looks at the implementation and operation of national systems including national databases, e-procurement system and other applications based on standard criteria and government practices. (4) Infrastructure: This category aims to increase and improve the infrastructure. (5) E-Participation: This category aims to support citizen participation in government processes including administration, service delivery and decision making by providing the main IT & communication tools. (6) Institutional Framework: This category looks at the leadership role, organisation, and the regulations covering e-government (E-government Program 2012).

This initiative is still in its early stages and more effort is needed. For example a discussion of actual readiness is clearly missing and this will reflect negatively on the adoption of e-government at all levels. Additionally, considering an e-government portal, it was found that most of the government organisations work separately: It would clearly be more beneficial for government departments to work together to provide better services to all stakeholders. Saudi Arabia ranks as no.41 as indicated by the UN's assessment of e-government development (UN, 2012).

3.4 An Introduction of Technology Acceptance Model

ICT is growing in influence in the lives of people on a global scale (Cortada, 2008). The impacts of this rapidity and extent of pervasiveness have driven much of the research into technology diffusion and acceptance (Wejnert, 2002). This in turn has affected the development of a range of theoretical models and frameworks that attempt to investigate technology acceptance including the works of (Davis 1986, 1989; Hess et al, 2010; Cornell et al, 2011). Out of these works the Technology Acceptance Model (TAM) is considered as one of the most useful models to predict use and acceptance of technology and information systems by individual users.

TAM has been widely studied and verified by different studies that examine the individual technology acceptance behaviour in different information systems constructs and e-government. In the TAM model, Figure (1), as identified by Davis (1986, 1989), there are two key factors namely 'perceived usefulness' (PU) and 'perceived ease of use' (PEOU).

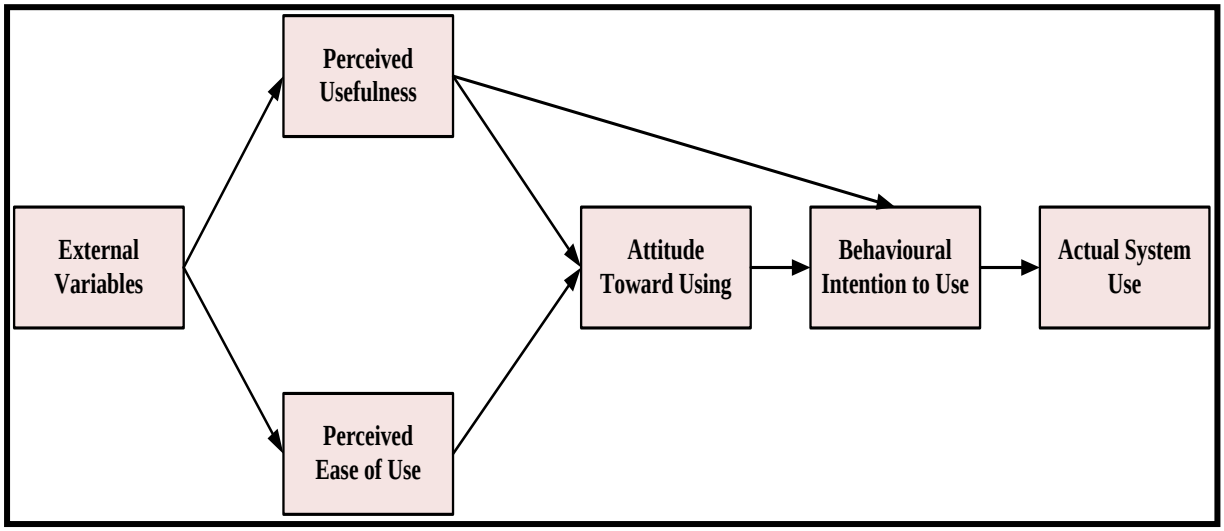

Figure 1: Technology Acceptance Model [TAM] (Davis 1989)

Perceived usefulness refers to the prospective user's subjective probability that using a specific application system will enhance his or her job or life performance. While perceive ease of use refers to the degree to which the prospective user expects the target system to be free of additional effort. While TAM is a very well-researched and simple model that aims to explain and determine the factors affecting computer users' acceptance in a wide range of contexts, it also gives predictions and reasons as to why any systems may not succeed (Davis et al, 1989). TAM has been found to be a reliable model, valid and powerful in predicting users 'adoption of a new technology in a variety of contexts, including e-government (Jaeger and Matteson, 2009; Lin and Liang, 2011; Alomari et al, 2012; Cegarra-Navarro, 2014).

TAM contains factors accepted by Davis (1989), together with PU, PEOU, behavioural intentions and attitudes relating to accepting and using new technology. The model also incorporates three main external factors as displayed in (I) social factors, (II) cultural factors and (III) political factors, owing to the varied influences exerted by culture on human behaviour (Ziefle, 2010). Often the practice is to take the existing knowledge regarding technology acceptance in developed western nations and to relate it to other cultures based on cultural beliefs and values. However, (Ziefle, 2010) confirms that, people use technology within a cultural and social context, and these influence how humans behave towards technology. There are often factors that differ across cultures, including social taboos, political and legal constraints, together with religious, ethical and traditional values.

TAM has been investigated and applied, in the field of e-government, within the Gulf countries. Al Awadhi and Morris, 2009; conducted a study in Kuwait to investigate the factors that affect the adoption of e-government services. They confirmed that usefulness of e-government services, ease of use, reforming bureaucracy, cultural and social influences, connections, face-to face interaction, cultural differences; gender issues, technical issues, and trust in the Internet, lack of awareness affect and use of e-government were major concerns.

AlNuaimi et al, 2011; carried out a study in the UAE using TAM with 11 independent variables: Lack of awareness, trust in the Internet, and Website security, trust in municipal organisations, perception of usefulness, age, information literacy, computer literacy, perceptions of compatibility, citizens' perception of ease of use, the quality of information system, and the quality of information The findings of this study showed that trust in government, perceptions of usefulness, perceptions of ease of use, quality of e- government

information systems, and the quality of information in the e-government portal were found to have an effect on the citizens' inclination to use e-government services.

Al-Gahtani, 2011; investigated the factors that affect the adoption of e-transactions services using TAM in Saudi Arabia. TAM was used as a base model for the study's conceptual model which is extended to incorporate three major cognitive constructs (credibility, trust, and risk) related to e-transactions. In his study a general Internet use and several demographic variables, such as gender, age, educational level, and work type, were also considered to achieve a wider picture of individual acceptance of e-transactions in the Saudi Arabia. This study confirms that credibility, trust, risk, and general Internet use are important requirements for the successful introduction of e-transaction technologies. Moreover, gender and educational level as demographic variables have their due in predicting individual intention for e-transactions in Saudi Arabia. Alternatively individual age and work type were not found to be significant factors in e-transactions acceptance in Saudi Arabia.

3.5 Saudi Arabia and UAE Progress toward E-government a Comparative Study

For this comparison of e-government adoption between Saudi Arabia and UAE, trend analysis is used. Trend analysis takes dependent variables as the data to be forecasted and an independent variable of time. To calculate the trends two years worth of data were used for Online Service Index (OSI), Telecommunications Infrastructure Index (TCII), and Human Capital Index (HCI).

3.5.1 Telecom Infrastructure Index Trend Gap Analysis between KSA and UAE

The telecommunications infrastructure index indicator is used to measure the development of telecommunications infrastructure, which is related to the country's development and subsequent use of e-government. This indicator has five sub-indicators, each with a 20% weighting: The number of personal computers per 100 persons (PCp100), the number of Internet users per 100 persons (IUp100), the number of telephone lines per 100 persons (TLp100), the number of mobile cellular subscriptions per 100 persons (MCSp100) and the number of fixed broadband subscribers per 100 persons (FBSp100).

The Saudi Arabia telecommunication infrastructure index has improved during the period of 2010 and 2012 as seen in (Table 1). In 2010, the overall Telecommunication Infrastructure

Index was good as 0.4031 but the value increased to 0.4323 in 2012. The trend analysis showed us that Saudi TIII is improving every year with the positive trend value of 0.0292. Likewise the UAE telecommunication infrastructure index has improved during the period of 2010 and 2012. The trend analysis (Table 1) showed that UAE TIII is improving with the positive trend value of 0.0134.

The number of Internet users per 100 persons in Saudi Arabia has been changing over the period 2010 – 2012. The estimated number of the Internet users were just 30.55 per 100 persons but this figure increased to 41.00 in 2012 with the positive trend of 10.45 (per 100 persons) which shows that Saudi government recognised the importance of the Internet as a communication and management tool in e-government. Comparatively in UAE the estimated number of Internet users was 78 per 100 persons in 2012 increasing with the positive trend of 21.85.

Furthermore, mobile devices can be seen as an effective technology for providing government services. In Saudi Arabia the number of mobile subscribers was 142.85 per 100 mobile devices in 2010 (UN, 2010). Moreover, the number of mobile subscribers has increased to 187.86 in 2012 with the positive trend value of 45.01 in 2012. The acceptable of mobile and the augmented should deliberate as an effective technology for providing government services. Therefore it can be postulated that, in developing countries like Saudi Arabia, mobile devices can play a significant role in promoting the use of e-government.

Years	TIII		Estimated Internet Users		Fixed Telephone lines		Mobile Subscribers		Personal Computers		Fixed broadband	
	KAS	UAE	KAS	UAE	KAS	UAE	KAS	UAE	KAS	UAE	KAS	UAE
2010	0.4031	0.5434	30.55	56.15	16.27	33.63	142.85	208.65	68.25	33.08	4.16	11.79
2012	0.4323	0.5568	41.00	78.00	15.18	19.70	187.86	145.45	7.02	20.24	5.45	10.47
Trend Gap	0.0292	0.0134	10.45	21.85	-1.09	-13.93	45.01	-63.2	-61.23	-12.84	1.29	-1.32

Table 1: TIII (Telecommunication infrastructure Indicators Index)

3.5.2 Online Service Index (OSI) Trend Gap Analysis between KSA and UAE

The Online Services Index (OSI) is used to measures the development of online services. This indicator is based upon four sub-indicator stage models: Emerging Presence, Enhanced Presence, Transactional Presence, and Connected services.

Years	OSI		Emerging information services		Enhanced information services		Transactional services		Connected services	
	KAS	UAE	KAS	UAE	KAS	UAE	KAS	UAE	KAS	UAE
2010	0.3111	0.2508	0.46	0.46	0.25	0.26	0.22	0.02	0.05	0.05
2012	0.7974	0.8627	0.92	1	0.6	0.74	0.77	0.83	0.67	0.67
Trend Gap	0.4863	0.6119	0.46	0.54	0.35	0.48	0.55	0.81	0.62	0.62

Table 2: (OSI) Online Services Index

As indicated in (Table 2) the online services index for Saudi Arabia and UAE have continuously improved during the period of 2010 and 2012. In 2010, the overall online services index was 0.3111 but the value increased to 0.7974 in 2012 for Saudi Arabia. The trend analysis showed that Saudi Arabia OSI has improved with a positive trend value of 0.4863. However, the trend analysis showed that UAE OSI is improving with a positive trend value of 0.6119.

3.5.3 Human Capital Index Trend Gap Analysis between KSA and UAE

Human Capital Index (HCI) indicator is used to measure the development of Human Capital. This indicator is based upon two sub-indicators: Adult literacy and the combined primary, secondary, and tertiary gross enrolment ratio.

Years	HCI		Adult Literacy Rate		Gross Enrolment Ratio	
	KAS	UAE	KAS	UAE	KAS	UAE
2010	0.8346	0.8192	85.00	90.00	80.39	65.76
2012	0.7677	0.7837	86.13	90.03	81.55	78.12
Trend Gap	-0.0669	-0.0355	1.13	0.03	1.16	12.36

Table 3: (HCI) Human Capital Index

As indicated in (Table 3) the Human Capital Index for Saudi Arabia and UAE have improved during the indicated period. In 2010, the overall human capital index was 0.8346 but the value reduced to 0.7677 in 2012. The trend analysis showed that the Saudi Arabian HCI had a negative trend value of -0.0669 for year 2012. The trend analysis showed that UAE HCI had a negative trend value of -0.0355 for year 2012.

Based on the above analysis it is now possible to see which indicators are more important to improve the e-government services in Saudi Arabia.

Firstly, the lack of Telecommunication Infrastructure is holding back Saudi Arabia: Saudi Arabia is ranked in 60th place in the World with an overall telecommunication index score of 0.4323. Since 2010, Saudi Arabia telecommunications infrastructure index has been gradually increasing. This is a good sign, but there is still a gap between Saudi Arabia and the Gulf region's best performer, UAE. According to Table (1) Saudi Arabia should put more effort into improving total fixed broadband per 100 individuals since there is a big gap between Saudi Arabia and UAE. The second indicator, where Saudi Arabia is behind UAE, is the estimated number of Internet users. The gap between the two countries is about 11.4% In order to catch up with UAE, Saudi Arabia ought to focus on these aspects in order to improve its e-government development and performance.

Secondly, the online services index and its four indicators placed UAE in 12th place in the 2012 survey while Saudi Arabia was ranked 19. If Saudi Arabia is compared with other countries in the Gulf region, Saudi Arabia is not performing well in online services. According to the trend gap analysis Saudi Arabia is lagging behind UAE. Thus Saudi Arabia should place more focus on the area of transaction services.

Lastly, the human capital index of Saudi Arabia needs to be considered. The adult literacy rate in Saudi Arabia has reduced from 0.8346 in 2010 to 07677 in 2012. A similar trend is observed in UAE, which was 0.8192 in 2010 and decreased to 0.7837 in 2012. Therefore Saudi Arabia as well as UAE should take measures to increase adult literacy.

3.6 Analysis of the Key Performance Indicators (KPIs)

According to the E-Government Program (Yesser, 2011), 9.47% of government organisations have made some progress in terms of construction and availability to provide electronic services. 43.16% have made good progress, whilst 33.68% have made modest progress. In the UAE, according to Telecommunications Regulatory Authority (TRA, 2011), about 45% of the federal organisations provided electronic services at operational maturity. Meanwhile 40% were classified as emerging level whilst 15% achieved a mature level of operational maturity.

3.7 A Discussion Covering the Outcomes of the Comparative Study

In this section we will summarise the key findings from the above conducted comparative study. Most of these findings could be considered as extra or additional challenges to the carried out case study.

3.7.1 Implementation of E-government

The implementation of e-government contains some technological complications such as a requirement for shared standards and compatible infrastructure between departments and organisations. In addition, security and privacy are obstructions to an implementation of e - government. Implementation problems correspond to the external variables block of the technology acceptance model.

3.7.2 Accessibility

In Saudi Arabia, the most common challenge to the adoption of e-government is accessibility, which is as a result of a large population of citizens that do not use technology, or require skills to use technology, and do not have access to technology. The situation has improved, but accessibility and availability, still continue to be a significant barrier for a large number of Saudi people.

3.7.3 Maintenance

One other important issue for e-government implementation is maintenance of the information on the website. The website needs to be constantly upgraded along with procedural and policy changes. Additionally, the interactive features and mechanisms on the website are required to be tested regularly.

3.7.4 Departments

E-government covers all government services. Each service has separate requirements. This needs be considered in proposing readiness mechanisms for an e-government. Departmental differences are very much dependent on behavioural intention and actual system use in the TAM. Therefore, participants from all departments involved in e-government must focus on the interaction part of an e-government programme.

3.7.5 Content Control

Internet users can be divided into three categories; new, intermediate, and expert. Content should be written in a manner which can assist everyone. In this context actual systems use and perceived usefulness are applied to understand the important of managing contents to help users accessing different e-government services.

3.7.6 Age Factor

Unlike adults, young users tend to use services that attract them. Therefore, cautions should be taken in terms of taking every one's on board for longer term. It is in due context attitude of TAM attains prime important in delivering e-government sections objectives to be useful and equally beneficial for people of all ages.

3.7.7 Application Software

Most of the available software is written in languages, which are not understandable for IT professionals in Saudi Arabia. Considering the above-mentioned circumstances, it seems evident that government should deal with a digital training. At present, there is no general course programme designed at all for public employees in Saudi Arabia, not even for those managing computer applications with the language in which the software is written. External variables and perceived ease of use of TAM are applied to identify challenges and is explained accordingly.

3.7.8 Manual or Electronic

What is not known to ordinary person is the simplicity of e-government. People who prefer to do or deal with government transactions manually than electronically are many, thus, this is still an issue within Saudi Arabia. There is a need of developing trust of e-government in ordinary people. In view of people understanding and use of an e-government perceived ease of use of TAM can be useful in identifying measures to broadened people approach of using such facilities.

3.7.9 Language of Understanding

Success of e-government needs prompting the concept in an understandable language of or languages with which stakeholders are comfortable. As in Saudi Arabia the official language is Arabic. Therefore, all supporting materials such as tutorials, videos or audios should be prepared in Arabic. This is something to be understood with respect to actual system use as defined by TAM.

3.7.10 E-government Laws and Regulations

There is no doubt that e-government laws are playing an important role for the future of e-government development. In Saudi Arabia as a case study, the government has issued several government laws and regulations such as; information criminal law, e-transaction law and

other laws. These regulations and laws have significant and essential role in promoting successful communication between citizens, business and government to support the adoption of e-government service. However, most of these regulations and laws are not published as required by e-government adoption process. Therefore, all these should to be published in order to provide confidence in their use and enhance the further of e-government services. This has to deal with behavioural intention of TAM, to expand what is already available, and to deliberate what could be needed on a longer term.

3.7.11 Information Theft Threats

E-government is the way ahead for Saudi Arabia, through implementing advances of new technologies by delivering more efficient services to the stakeholders. However, threats of information theft have appeared as one of the challenges faced by e-government in Saudi Arabia. Therefore, it's an essential for Saudi Arabia to adopt an advance technology to ensure that all information and data are protected. In this context attitude as describe by TAM is fully applicable. This further explains and highlights the consequence of involvement in such activities.

3.7.12 Awareness

Awareness about the importance of e-government is one of the most important elements to drive e-government to be successful. Like other developing countries, Saudi Arabia began the national e-government initiative which aims to simplify procedures and provide government services and information available to the government, business and citizens online. Moreover, a lot of services have provided via ICT in Saudi Arabia, but the adoption rates of these services are less than expected. It is due to the lack of awareness about the e-government and the importance of e-government services in Saudi society and particularly in rural communities. Therefore, awareness though sound related to perceived usefulness and perceived ease of use of TAM. However, it is also related to actual system use. It is in this connection we could state that a better awareness of e-government can be established through the implementation of the above factors of TAM.

3.7.13 E-governance as Taught Course

It is a good concept that e-governance should be integrated in program of studies and taught as a course in undergraduate or postgraduate level. This in turn will provide an opportunity for students and others to explore the topic at a technical level. With no doubt this will help in

promoting e-governance at different levels. It is clear that this issue corresponds to perceived usefulness and perceived ease of use of the technology acceptance model. Therefore, a better understanding could be acquired of this topic through a combination of the above mentioned area of technology acceptance model.

3.8 Summary

The main objective of this chapter was to conduct a comparative study between Saudi Arabia and other developed countries with a similar profile in order to identify extra challenges pose to the e-government within Saudi Arabia. The successful implementation of e-government systems go beyond the technological as well as the non- technological aspects, requiring the government to look deeply in the Saudi Arabia context. A completed analysis including the comparison of Saudi Arabia e-government and UAE in each indicator also have been included in this research project using United Nation e-government survey reports as the main source of data. The finding of this chapter identified some challenges that likely affect the e-government adoption and readiness in Saudi Arabia.

Chapter Four: Research Methodology and Data Analysis

4.1 Research Methodology

This section describes the research methodology adopted for this work. The major part of the section, however, is devoted to presenting the collected data gained through the fieldwork in Saudi Arabia.

The questionnaires and interviews were designed to collect data with open-and-closed ended questions with the objective to survey and assess the current state of e-government as-is and to collect the citizens', officials', and staff opinions about e-government service as well as assessing the readiness and maturity of e-government services in the Kingdom of Saudi Arabia. The other objective is to identify and investigate the critical factors influencing the adoption of e-government services and determining the factors that could prevent governments advancing to e-government. The collated data is analysed and explained with a view to understanding critical issues affecting e-government.

In this context the mixed-methods approach is used due to the capability of the mixed-methods approach to allow the researcher to achieve a more complete view of the research problem being studied. The mixed-methods approach is broadly used in research for obtaining several perspectives, viewpoints, and angles of a research problem with the use of qualitative and quantitative data (Johnson et al, 2007). Obtaining different perspectives, viewpoints, and angles of a research problem is helpful in constructing a comprehensive picture of the problem being studied and focus (Farmer and Knapp, 2008; Woolley, 2009; Creswell and Plano Clark, 2011). Due to these advantages, this research adopts a mixed-methods approach for answering the research question.

Consequently, due to the other dimension of this research, which aims to providing a modelling and analysis method to guide the assessment of E-government Information Systems (EGIS), then the most appropriate and suitable research school of thought is the positivism. The reasons for selecting this research philosophy centred on the adoption and implementation of e-government, dealing with and affected by many elements, such as the Technological, Organisational, and Environment/Society aspects.

Data Collection Sources and Techniques: Once the most appropriate research approach was set, it was necessary for the researcher to decide on how the data will be collected; the data collection can be classified as primary and secondary. Primary data is recognised as data assembled and collected with interviews, questionnaires, survey or observations.

While secondary data can be collected from various documents such as books, periodical, articles, on the Internet. Secondary data can usually be assembled faster than primary data (Zikmund, 2000). Based on that in this research both of primary and secondary data has been used. The primary data has been collected through a set of questionnaires and interviews: (I) Interviews: The research involves conducting structured interviews with a sample of government officials in Saudi Arabia. The focus of the interviews will be determined by the preliminary analysis of the questionnaire data to identify themes and issues. Each interview will take approximately 30 – 45 minutes. (II) Questionnaires-Based Survey: These were distributed to the citizens and staff in two major cities in Saudi Arabia, namely: Makkah and Jeddah. They contain both open and close-ended questions that relate to the operation of the research questions identified above. Although the Secondary data has been collected from the usual sources such as: (I) Systematic review and analyses of the literature in the area of information systems to provide a systematic understanding in general, with specific focus on current state-of-the-art of the e-government development in the real time environment. (II) Additional studies beyond the scope of the evaluation activities for e-government information systems regular literature review and Internet searches carried out to assess the current state of research into e-government information systems design. These include Official reports and studies in the public domain, especially those related to the e-government developments.

Data Analysis Techniques: In this research stage, the researcher used various analytical techniques. This involved the classifications of the data, noting regularities and patterns, deriving explanations, and reviewing and rechecking findings. In addition, these processes were regularly related back to the initial framework and, at the same time, enhanced the revision of the framework in the light of the analysed data. The data from the valid forms was analysed using the Statistical Package for Social Science (SPSS) version (17.0). Descriptive statistics and the one-sample t-test were used and chosen as an appropriate technique to analyse the questionnaire data. Descriptive statistics was conducted over all parts of the questionnaire by running a frequency and percentage for each factor. For all Likert-type scale factors means and standard deviations were also used to analyse data, to identify the most important factors that have an effect on the readiness to use e-government systems in Saudi Arabia. For the statistical significance between factors one-sample t-test was used. The purpose of the using one-sample t-test and was to verify whether there are any statistical significance between factors used in the framework to assess the readiness and the organisations readiness to adopt and use e-government systems.

4.2 Presentation and Analysis of Data

This section provides the presentation and analysis of data gleaned from the questionnaire surveys.

4.2.1 Citizens' Survey

Demographic Variables and Data Analysis: The questionnaire was designed to gather information about the study population, in order to show the distribution of the population of this study by age, gender, nationality, education level, and income. This information is very important to the research because it will aid the reader in understanding some pertinent issues that may have a bearing on the analysis; for instance how the demographic characteristic variables relate to the readiness assessment process. Demographic variables of respondents, obtained from the questionnaire are presented in the following (Table 4).

Demographics variables		Frequency	Percent %
Gender	Male	466	77.7
	Female	134	22.3
	Total	**600**	**100.0**
Age	Less than 20	77	12.8
	20 - 24	96	16.0
	25 - 29	123	20.5
	30 - 34	72	12.0
	35 - 39	69	11.5
	40 - 44	63	10.5
	45 - 49	58	9.7
	50 - 54	42	7.0
	Total	**600**	**100.0**
Education Level	Intermediate School	16	2.7
	High School	72	12.0
	Bachelor Degree	498	83.0
	Master Degree	11	1.8
	Doctoral Degree	3	.5
	Total	**600**	**100.0**
Income	Less than 2,999	158	26.3
	3,000 - 5,999	88	14.7
	6,000 - 8,999	129	21.5
	9,000 - 11,999	107	17.8
	15,000 - 19,999	72	12.0
	More than 20,000	46	7.7
	Total	**600**	**100.0**

Table 4: Demographic Characteristic Variables for Citizens

Figure (2) below illustrates the distribution of the questionnaire respondents according to the gender. It shows that the high percentage of the participants 77.7% (n=466) of the respondents were male, while 22.3% (n=134) were female.

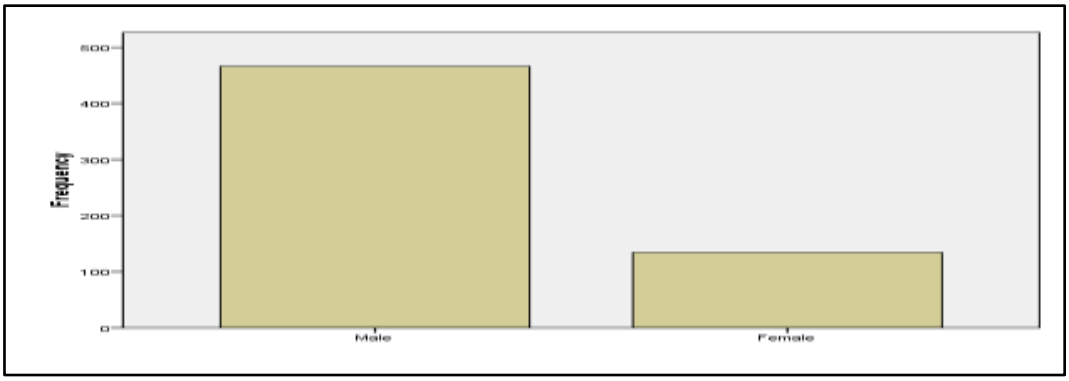

Figure 2: Distribution According to Gender

The distribution of the participants according to their ages is illustrated in Figure (3) below.

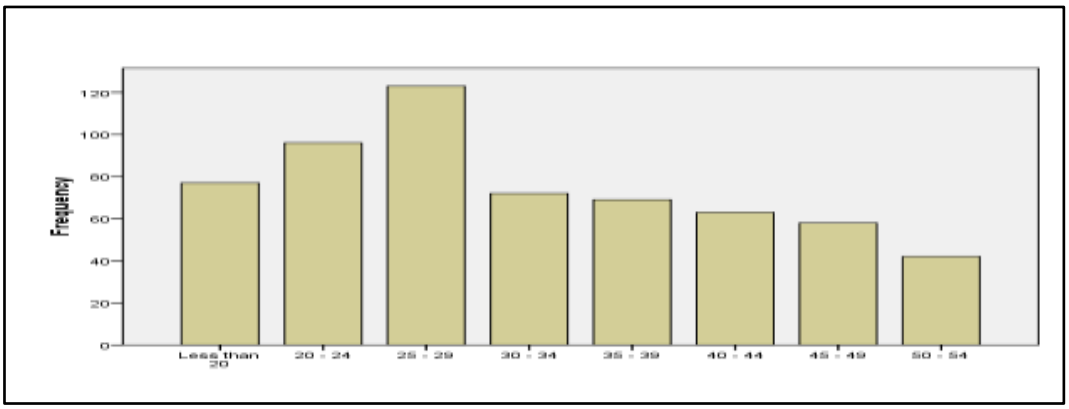

Figure 3: Distribution According to Age Range

The above Figure shows that the age group forming the highest percentage of the citizens' population sample is the 25 - 29 years old group with 20.5 %. Followed by 20 - 24 years old group forming 16.0 % of the sample. Then came the two categories of "less than 20" and 30 – 34 years old in the third and fourth ranks respectively. The next age groups were 35-39 at 11.5%, 40-44 at 10.5%, 45-49 at 9.7% and 50 – 54 at 7.0% of the population sample. It can be seen that the majority of the participants are within the age group 20-24 and 25-29, illustrating the situation that Saudi Arabia's population is relatively young. Thus, using the Internet for e-government is most prominent among the younger and middle-aged generations.

Regarding the education level of the participants: They were asked to indicate their level of education, because it was thought that the participants' education might have some influence on their knowledge of using computers and e-government.

Figure (4) below illustrates that 83.0% (n=498) of the participants had bachelor's degree, followed by high school holders at 12.0% (n=72), then intermediate school and master's degree in the third and fourth ranks with only 5% (n=3) with a doctoral degree.

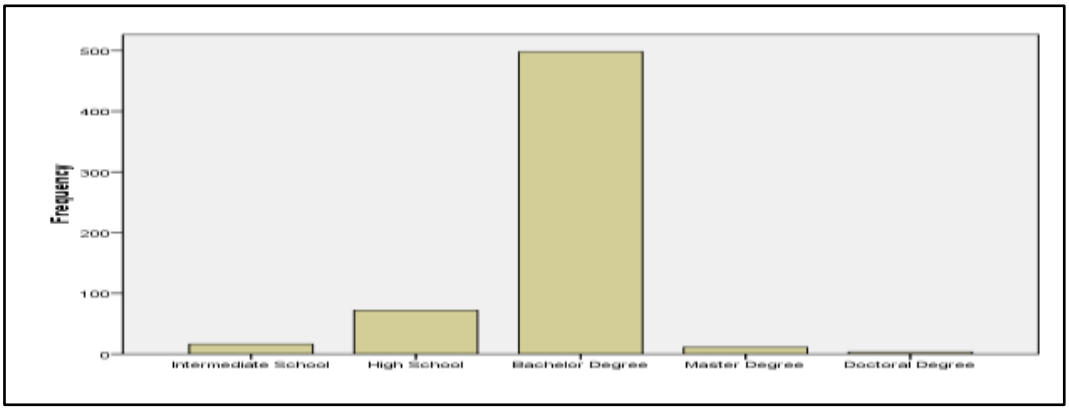

Figure 4: Distribution According to Education Level

For the income distribution of the participants: Figure (5) below shows that the highest percentage 26.3 % of the group have an income of less than 2,999 SR, followed by the group with incomes of 6,000 – 8,999 SR (12.9%), then came the income categories of 9,000 – 11,999 SR and 3,000 – 5,999 SR in the third and fourth ranks. Finally, those groups with incomes in the categories of 15,000 – 19,000SR and more than 20,000 come in the fifth and sixth ranks, respectively.

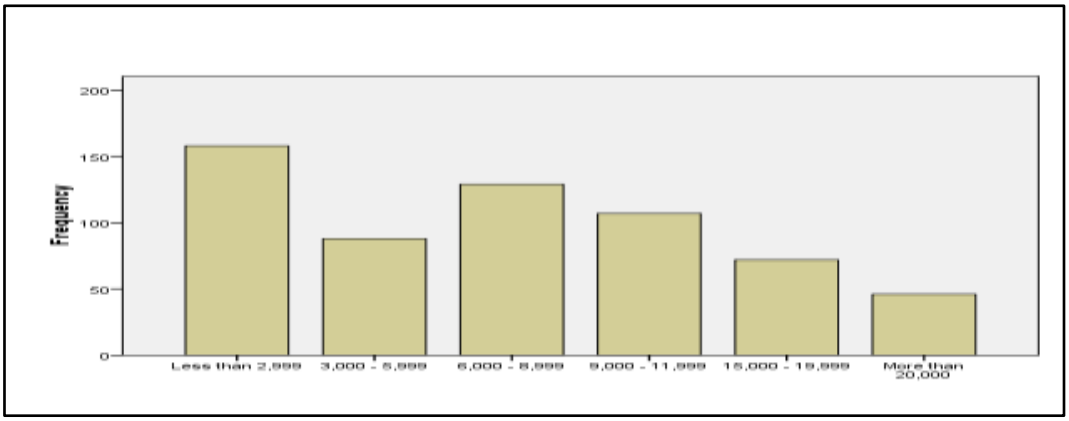

Figure 5: Distribution According to Income Level

Using the Computer and Internet Experience: This section provides information on the distribution of respondents categorised by their experience of using Computers and the Internet. This section is divided into two parts; the first part will discusses the general attitudes towards using computers and the second part will discusses the general attitudes towards experiences of Internet use.

In terms of their computer use and experience as in Table (5), 100% of the participants (n=600) reported that they had used computers before. In terms of the places where the participants use computers the majority 47.7% (n=286) reported using computers at home.

In the second place comes home and work where 30.3% (n=182) reported that they usually use the computer there. Then the two categories of "at office" 13.2% and "at a public access", 8.8% came in the third and fourth ranks. Regarding the length of time using the computer, 58.0% of participants (n=348) reported that they use the computer between one to five hours a day. While another 20.0% (n=120) of participants indicated that they use computers less than one hour a day. 15.3% (n=92) reported between six to 10 hours per day; and 6.7% (n=40) used computers for 10 hours a day or more. In terms of what the participants are using the computer for: 67.0% (n=402) reported that they had use computers for Internet applications. While 26.5% (n=159) of participants indicated that they use computers for office applications. 6.5% (n=39) of respondents used their computer time for games and entertainment.

Questions		**Frequency**	**Percent %**
Have you ever used a computer?	Yes	600	100.0
	No	-	-
	Total	**600**	**100.0**
Where do you use computer usually?	At home	286	47.7
	At office	79	13.2
	At a public access	53	8.8
	Home and Work	182	30.3
	Total	**600**	**100.0**
How often do you use a computer a day?	Less than 1 hour	120	20.0
	1 to 5 hours	348	58.0
	6-10 hours	92	15.3
	10 hours or more	40	6.7
	Total	**600**	**100.0**
What do you use a computer mainly for?	Internet	402	67.0
	Games and	39	6.5
	Office applications	159	26.5
	Total	**600**	**100.0**

Table 5: Computer usage and Experience

Following on from computer use, Internet use was then assessed:

Regarding Internet experience Table (6), 100% of the participants (n=600) reported that they had used the Internet before. In terms of the time of using the Internet, 65.7% of participants (n=394) reported that they spend between one and five hours a day using the Internet. While 15.8% (n=95) of participants reported that they use the internet between six and 10 hours a day and 11.0% (n=66) for 10 hours a day or more. The lowest percentage, 7.5% (n=45) used the Internet for less than one hour a day.

In terms of what the users did on the Internet: The majority of the participants 60.0% (n=360) reported that they use the Internet for communications such as e-mails and chats. Another 33.7% (n=202) of participants indicated that they use the Internet for education and information search. Finally 6.3% (n=38) use the Internet for work.

Regarding the Internet connection for access, 85.0% of participants (n=510) reported that they had DSL (Digital Subscriber Line) to access the Internet; only 15.0% (n=90) reported Dial-Up access.

Questions		Frequency	Percent %
Have you ever used the Internet?	Yes	600	100.0
	No	-	-
	Total	**600**	**100.0**
How often do you use the Internet a day	Less than 1 hour	45	7.5
	1 to 5 hours	394	65.7
	6-10 hours	95	15.8
	10 hours or more	66	11.0
	Total	**600**	**100.0**
What do you use the Internet mainly for?	Communication (email/chat)	360	60.0
	Work	38	6.3
	Education / Information search	202	33.7
	Total	**600**	**100.0**
What type of Internet connection do you have?	Dial-up	90	15.0
	Broadband (DSL , or Cable)	510	85.0
	Total	**600**	**100.0**
How do you rate the Internet connection?	Very Fast	36	6.0
	Fast	214	35.7
	Reasonable	206	34.3
	Poor	144	24.0
	Total	**600**	**100.0**
How do you rate the Internet prices?	Very expensive	319	53.2
	Expensive	209	34.8
	Cheap	72	12.0
	Total	**600**	**100.0**
Overall, how do you rate your Internet and computer skills	Expert User	72	12.0
	Advanced User	264	44.0
	Novice User	208	34.7
	Beginner/New Computer User	56	9.3
	Total	**600**	**100.0**

Table 6: Internet usage and Experience

As indicated in the previous table (6), the participants were asked to give their comments and opinions about the Internet connection rate and the Internet price structure that forms part of the assessment for technology readiness. In this 35.7% of participants (n=214) reported that the Internet connection is “Fast”. Another 34.3% (n=206) of participants indicated that the Internet connection is “Reasonable”, following by 24.0% (n=144) commenting that the Internet connection is “Poor”. Only 6.0% (n=36) reported their Internet connection to be

"Very Fast". For Internet pricing the majority of the participants 53.2% (n=319) reported the cost of Internet access as "Very Expensive"; 34.8% (n=209) of participants indicated that the cost is "Expensive"; with only 12.0% (n=72) of participants rating the price of Internet access as "Cheap". When the participants were asked about their Internet and computer skills, 44.0% (n=264) reported that they are "Advanced Users"; 34.7% (n=208) said that they are "Novice Users". 12.0% (n=72) rated themselves as "Experts Users"; with only 9.3% (n=56) of participants rating their Internet and computer skills as "Beginner/New computer user".

The next set of questions put to the citizens assessed e-government in the KSA: In terms of e-government experience and use 73.7% (n=443) are aware of the e-government concept and initiatives in K.S.A, and 83.7% (n=502) were ready to use it in the near future as shown in Table (7).

Questions		Frequency	Percent %
Are you aware of any e-government service in K.S.A?	Yes	443	73.8
	No	157	26.2
	Total	**600**	**100.0**
Are you ready to use?	Yes	502	83.7
	No	98	16.3
	Total	**600**	**100.0**
Do you access e-government websites (portals)?	Yes	443	73.8
	No	157	26.2
	Total	**600**	**100.0**
What do you think about availability of the current e-government services?	All Services are available	88	14.7
	Services are partially available	201	33.5
	More Services are required	154	25.7
	Missing	157	26.2
	Total	**600**	**100.0**

Table 7: E-government Experience and Use

Regarding the visiting or access to e-government websites (Portals), for browsing or making transactions, 73.8% (n=443) of the participants reported that they had accessed the websites, whereas 26.2% (n=157) of the participants indicated they had not accessed e-government websites. Subsequently the next set of questions put to the citizens, assessed the availability of e-government services the participants were asked to give their comments and opinions about the availability of current e-government services for the assessment of the technology readiness. In this part 33.5% of participants (n=201) reported that services are partially available; while 25.7% (n=154) of participants indicated that more services are required, with 14.7% (n=88) commenting that all services are available.

Information System Infrastructure assessment section: The main aim of this section, of the questionnaire is to assess the information system infrastructure. In this section three parts

(System Quality, Information Quality, and Services Quality) are covered. The descriptive analysis has been conducted to verify whether the data is normally distributed. This analysis includes calculating the frequencies, percentages, means and standard deviations, using a five-point scale; (5 for Strongly Agree, 4 for Agree, 3 for Partly Agree, 2 for Disagree, and 1 for Strongly Disagree). Table (8) shows the questions asked and the range of responses.

Code	Items		SA	A	PA	D	SD	Mean	S.D
			5	4	3	2	1		
(A)	**System Quality (SysQ)**								
SysQ1	The website provides necessary information and forms to be downloaded.	F	22	134	161	126	-	3.12	.885
		%	3.7	22.3	26.8	21.0	-		
SysQ 2	The website provides helpful instruction for performing my task.	F	13	129	201	100	-	3.12	.788
		%	2.2	21.5	33.5	16.7	-		
SysQ 3	The website quickly loads all the text and graphics.	F	33	106	142	162	-	3.02	.951
		%	5.5	17.7	23.7	27.0	-		
SysQ 4	Interacting with the web site is a clear and understandable process.	F	140	32	138	113	20	3.36	1.23
		%	23.3	5.3	23.0	18.8	3.3		
SysQ 5	The web site is flexible to interact with.	F	82	103	105	105	48	3.15	1.28
		%	13.7	17.2	17.5	17.5	8.0		
(B)	**Information Quality (InfQ)**								
InfQ6	The website provides information precisely according to my needs.	F	33	147	163	100	-	3.26	.890
		%	5.5	24.5	27.2	16.7	-		
InfQ7	The information on the website is up-to-date.	F	83	126	137	97	-	3.44	1.03
		%	13.8	21.0	22.8	16.2	-		
InfQ8	The website provides information I need at the right time.	F	24	243	83	57	36	3.37	1.04
		%	4.0	40.0	13.8	9.5	6.0		
InfQ9	The information presented in the website is related to the subject matter.	F	37	162	147	45	52	3.20	1.11
		%	6.2	27.0	24.5	7.5	8.7		
(C)	**Services Quality (SerQ)**								
SerQ10	This website is well organised.	F	55	124	153	111	-	3.28	.976
		%	9.2	20.7	25.5	18.5	-		
SerQ11	The website is available at all times.	F	47	140	153	103	-	3.30	.942
		%	7.8	23.3	25.5	17.2	-		
SerQ12	The web site has enhanced my effectiveness in searching for and using this service.	F	69	136	173	99	2	3.39	1.01
		%	11.5	22.7	22.8	16.5	.3		
SerQ13	The web site has provided a valuable service for me.	F	54	108	202	58	21	3.26	.993

SA= Strongly Agree, A= Agree, PA= Partly Agreed, D= Disagree, SD= Strongly Disagree, S.D= Standard Deviation

Table 8: Information System Infrastructure

System Quality (SysQ): The sub-table, part (A) of table 8, shows the frequencies, percentages, means, and standard deviations for each of the items within the system quality

variable. Regarding system quality which has five items (response issues): SysQ1, SysQ2, SysQ3, SysQ4, and SysQ5. It was found that the majority of the participants were between agree and partly agree for these system quality questions, whereas a small number of participants were strongly agree for almost all items in this part. As seen in the table 5 (part A), "Interacting with the web site is a clear and understandable process", was rated the highest with mean 3.36 in this part, whilst the poorest rated was for "The website provides helpful instruction for performing my task", with mean 3.12 and standard deviation 0.778.

Information Quality (InfQ): The sub-table in part (B) shows the frequencies, percentages, means, and standard deviations for each of the items within the Information quality variable for InfQ6, InfQ7, InfQ8, and InfQ9. It was found that most of the participants were between agree and partly agree, whereas a small number of participants were strongly agreeing with the statements for almost all the items in this part. Furthermore, all of the items in system quality assessment have means over 3. Thus it would appear that information quality is quite strong in the KSA.

Services Quality (SerQ): The sub-table in part (C) shows the frequencies, percentages, means, and standard deviations for each of the items within the Services quality variable (SerQ10, SerQ11, SerQ12 and SerQ13) It can be seen that again all of the relevant means are over 3, suggesting a high level of services quality. (Table (8) part (B)).

General Attitudes towards E-government in Saudi Arabia: The citizens' attitude towards the e-government in K.S.A and future needs is assessed here. This data collection element contains twelve statements with Likert-type scales; (Strongly Disagree (1), Disagree (2), Partly Agree (3), Agree (4), Strongly Agree (5). Table (9) shows a summary of the citizens' responses.

In statement GA1, all of the citizens replied to this statement and most of them strongly agree, 53.2% (n=319) or agree 29.3% (n=179). 11.2% partly agree and 4% disagree with only 2.3% of the citizens strongly disagreeing with this statement. Overall the mean score for GA1 statement was 4.27 with a S.D of 0.971. In statement GA2, all of the citizens replied to this statement and most of them agree, 67.7% (n=406) or strongly agree 23.8% (n=143). Only 6.2% partly agree, 1.5% disagree and 0.8% strongly disagree with this statement. Overall the mean score for GA2 statement was 4.12 with a S.D of 0.649.

In statement GA3, all of the citizens replied to this statement and most of them agree 53.8% (n=323) or strongly agree 25.5% (n=153). Only 11.5% partly agree, 6.5% disagree and 2.8%

strongly disagree with this statement. Overall the mean score for GA3 statement was 3.93 with a S.D 0.938. In statement GA4, all of the citizens replied to this statement and most of them are agree 61.2% (n=367) or strongly agree 19.2% (n=115). 9.0% partly agree and 7.2% disagree with only 3.5% of the citizens strongly disagreeing with this statement. Overall the mean score for GA4 statement was 3.85 with a S.D 0.929.

Code	Items		SA	A	PA	D	SD	Mean	S.D
			5	4	3	2	1		
GA 1	The lack of IT training programmes in e-government service.	F	319	176	67	24	14	4.27	.971
		%	53.2	29.3	11.2	4.0	2.3		
GA 2	Insufficient number of computers in organisations for public use.	F	143	406	37	9	5	4.12	.649
		%	23.8	67.7	6.2	1.5	.8		
GA 3	The lack of confidence in the security, trust and privacy support in current e-government systems.	F	153	323	68	39	17	3.93	.938
		%	25.5	53.8	11.3	6.5	2.8		
GA 4	Non-availability of electronic signature.	F	115	367	54	43	21	3.85	.929
		%	19.2	61.2	9.0	7.2	3.5		
GA 5	Lack of qualified staff in the organisation to support e-government services.	F	170	407	10	10	3	4.22	.604
		%	28.3	67.8	1.7	1.7	.5		
GA 6	Lack of qualified staff in the organisation concerning with security issues.	F	133	333	42	23	69	3.73	1.19
		%	22.2	55.5	7.0	3.8	11.5		
GA 7	High cost of Internet and computer.	F	111	370	52	44	23	3.84	.941
		%	18.5	61.7	8.7	7.3	3.8		
GA 8	Lack of awareness and motivations about e-government services.	F	269	244	44	12	31	4.18	1.02
		%	44.8	40.7	7.3	2.0	5.2		
GA 9	Slow access to e-government system and downloading.	F	128	408	9	32	23	3.98	.887
		%	21.3	68.0	1.5	5.3	3.8		
GA 10	Slow e-government transactions.	F	189	240	62	77	32	3.80	1.17
		%	31.5	40.0	10.3	12.8	5.3		
GA 11	Technical problems, such as network and server malfunctions will effect on your attention to use e-	F	245	139	97	67	52	3.76	1.32
		%	44.8	23.2	16.2	11.2	8.7		
GA 12	Interaction with the e-government system would be clear if the leadership is committed to e-government project.	F	143	269	58	72	58	3.61	1.24
		%	23.8	44.8	9.7	12.0	9.7		

SA= Strongly Agree, A= Agree, PA= Partly Agreed, D= Disagree, SD= Strongly Disagree, S.D= Standard Deviation

Table 9: General Attitudes towards E-government

In statement GA5, all of the citizens replied to this statement and most of them are agree 67.8% (n=407) or strongly agree 28.3% (n=170). 1.7% partly agree and 1.7% disagree. Only 0.5% (n=3) of the citizens strongly disagreeing with this statement. Overall the mean score for GA5 statement was 4.22 with a S.D 0.604.In statement GA6, all of the citizens replied to this statement and most of them agree 55.5% (n=333) or strongly agree 22.2% (n=133). 11.5% strongly disagree and 7.0% partly agree. Only 3.8% (n=23) of the citizens disagree with this statement. Overall the mean score for GA6 statement was 3.73 with a S.D 1.19.

In statement GA7, all of the citizens replied to this statement with 61.7% (n=370) agree, 18.5% (n=111) strongly agree, 8.7% partly agree, and 7.3% disagree. Only 3.8% (n=23) of the citizens strongly disagreeing with this statement. Overall the mean score for GA7 statement was 3.84 with a S.D 0.941. In statement GA8, all of the citizens replied to this statement and most of them are strongly agree 44.8% (n=269) or agree 40.7% (n=244). 7.3% partly agree and 5.2% strongly disagree. Only 2.0% (n=12) of the citizens disagree with this statement. Overall the mean score for GA8 statement was 4.18 with a S.D 1.09.

In statement GA9, all of the citizens replied to this statement and most of them are agree 68.0% (n=408) or strongly agree 21.3% (n=128). 5.3% disagree and 3.8% strongly disagree. Only1.5% (n=9) of the citizens partly agree with this statement. Overall the mean score for GA9 statement was 3.98 with a S.D 0.887. In statement GA10, all of the citizens replied to this statement and most of them are agree 40.0% (n=240) or strongly agree 31.5% (n=189). 12.8% disagree and 10.3% partly agree. Only 5.3% (n=32) of the citizens strongly disagreeing with this statement. Overall the mean score for GA10 statement was 3.80 with a S.D 1.17.

In statement GA11, all of the citizens replied to this statement and most of them are strongly agree 40.8% (n=245) or agree 23.2% (n=139). 16.2% partly agree and 11.2 disagree. Only 8.7% (n=52) of the citizens strongly disagreeing with this statement. Overall the mean score for GA11 statement was 3.76 with a S.D 1.32. In statement GA12, all of the citizens replied to this statement and most of them are agree 44.8% (n=269) or strongly agree 23.8% (n=143). 12.0% disagree and 9.7% partly agree. With only 9.7% (n=58) of the citizens strongly disagreeing with this statement. Overall the mean score for GA12 statement was 3.61 with a S.D 1.24.Within the assessment process the researcher asked the participants if the prefer to connect E-government Services using mobile phones: all of the participants replied to this statement: 62.8% of the participants (n=377) reported that they preferred to use their cell phone in order to connect with e-government. This left a sizeable minority, 37.2% (n=223) of

the participants who preferred not to. This led the government to consider this opportunity to more services through mobiles applications.

4.2.2 Impact Factors on Citizens' Readiness for E-government

This section aims to analyse the survey results investigating the impact of the readiness factors and sub-factors on citizens' readiness and usage of e-government services. Table (10) below shows factors and sub-factors that have been used in this section. This forms the basis of all the analysis in the remainder of this section.

Group	Factor	Sub-Factor	
Citizens Readiness	Demographics Characteristics	Age	
		Gender	
		Education Level	
		Monthly Income	
	Technology	Network Infrastructure	Type of internet
			Rate of internet
			Rate of internet prices
		IS Infrastructure	Info quality
			System quality
			Services quality
		Technology trust	Security
			Privacy
			Credibility
	Experience and Knowledge	Computer usage	Computer experience
			Place of using computer
			Time spend daily using computer
			Uses of computer
		Internet usage	Internet experience
			Place of using internet
			Time spend daily using internet
			Uses of internet
	Other factors		Awareness of e-
			Availability of e-
			IT Training
			Number of computers in organisations for public use
			Qualified staff in the
			High cost of Internet and
			Technical problems
			Citizens satisfaction
			Cell phone or Mobile

Table 10: Impact Factors and Sub-Factors

This analysis of the significance was based on chi-square and One Way Analysis Of Variance (One-Way ANOVA) using the SPSS statistical package to test and determine if there is a statistical association between readiness factors within the Saudi Arabia society and citizens readiness for e-government.

Demographics Characteristics: Firstly any statistical significance between Demographic Characteristics and citizens' readiness and to use e-government according to Age, Gender, Education Level, and Monthly Income were examined, as shown in Table (11). Statistical significance (P≤0.05) was shown in three sub-factors, age, education level and monthly income.

Factor	Sub- factor	P- Value
Demographics Characteristics	Age	<0.001*
	Gender	.513
	Education Level	<0.001*
	Monthly Income	<0.001*

Table 11: Statistically Significance between Demographic Characteristics and Citizens' Readiness
"*" Significant at P≤0.05

Computer and Internet Experience: There is a statistically significant link between computer and Internet experience factors and citizens' readiness to use e-government in the place of using computer and Internet, time spent daily using the computer and Internet, and Use of the computer and Internet as shown in Table (12).

Factor	Sub- factor	P- Value
Computer and Internet experience	Place of using computer and internet	<0.001*
	Time spend daily using computer and internet	<0.001*
	Uses of computer and internet	<0.001*

Table 12: Statistically Significant between computer and internet experience
"*" Significant at P≤0.05

Technology Infrastructure: Next statistical significance between technology and citizens' readiness to use e-government is assessed, as shown in Table (13) below. This shows that in Network Infrastructure, Rate of Internet connection, and Rate of Internet prices significantly affected the use of e-government, while the Type of internet connection was not statistically significant. Around 34.3% of the citizens considered Internet speed reasonable and 53.2% of the citizens considered the cost of the Internet as very expensive.

To determine the impact of security, privacy, and credibility issues, questions were asked using a five-point Likert scale varying from "strongly agree" to "strongly disagree"; Table (8). As shown in the Table (13) security, privacy, and credibility in technology and e-government have a statistically significant effect on the use of e-government.

Finally the Table (13) shows the statistically significance for each of the items within the system quality factors: SysQ1, SysQ2, SysQ3, SysQ4, and SysQ5. All factors were statistically significant here. See P-value in Table (13).

For InfQ6, InfQ7, InfQ8, and InfQ9 all factors were statistically significant. See P-value in Table (13). Likewise for SerQ10, SerQ11, SerQ12, SerQ13, SerQ14, and SerQ15 all factors were statistically significant. See P-value in Table (13).

Factor	Sub-factor			P-value
Technology	Network Infrastructure	Type of internet connection		.525
		Rate of internet connection		.006
		Rate of internet prices		.020
	Technology Trust	Security		<0.001*
		Privacy		
		Credibility		
	IS Infrastructure	Information Quality InfQ	SyQ1	<0.001*
			SyQ2	<0.001*
			SyQ3	<0.001*
			SyQ4	<0.001*
			SyQ5	<0.001*
		System Quality SysQ	InQ6	<0.001*
			InQ7	<0.001*
			InQ8	<0.001*
			InQ9	<0.001*
		Services Quality SerQ	SeQ10	<0.001*
			SeQ11	<0.001*
			SeQ12	<0.001*
			SeQ13	<0.001*
			SeQ14	<0.001*
			SeQ15	<0.001*

Table 13: Statistically Significance between Technology and Citizens' Readiness
"*" Significant at P≤0.05

Other Factors Impact Citizens Readiness for E-government: There was a statistically significance between citizens' readiness and the use of e-government according to awareness of e-government, computer and Internet training (IT training), the number of computers in organisations for public use, satisfaction with current services and the use of mobile phones. See P-value in Table (14).

Factor	Sub-factor	P-value
Other Factors	Awareness of e-government	<0.001*
	Availability of e-government services	.163
	IT Training	<0.001*
	Number of computers in organisations for public use	<0.001*
	Qualified staff in the organisation to support e-government services	.511
	Citizens satisfaction	<0.001*
	Cell phone or Mobile	<0.001*

Table 14: Statistically Significance between other factors and Citizens' Readiness

"*" Significant at P≤0.05

4.2.3 Staff/Employees Survey

The Characteristics Profile of the Employees: Participants In this first section of the questionnaire the purpose was to gather information about the study population, to show the distribution of the population by Current Position, Education Level, Years of Service and Training Courses. This information is very important to the research because it will help the reader to understand some pertinent issues that may have a bearing on the analysis. Background information variables of respondents as obtained from the questionnaire are presented in the following Table (15).

Demographics variables			Frequency	Percent %
Current Position		Head of Department	4	3.2
		Clerical	15	12.0
		Customer Service Rep	5	4.0
		IT Services	4	3.2
		Utilities Administration	61	48.8
		Others	36	28.8
		Total	**125**	**100**
Education Level		Intermediate School	10	8.0
		High School	43	34.4
		Bachelor Degree	72	57.6
		Others	-	-
		Total	**125**	**100.0**
Years of Service		1 - 5	18	14.4
		6 - 10	52	41.6
		11 - 15	24	19.2
		16 - 20	31	24.8
		Total	**125**	**100**
Training Courses Attended	General IT	1-3	80	64.0
		4-6	10	8.0
		7-10	4	3.2
		No courses	31	24.8
		Total	125	100.0
	More Training	Yes	94	75.2
		No	31	24.8
		Total	**125**	**100.0**

Table 15: Characteristics Profile of the Participants Distribution

As illustrated in Table (15) above and Figure (6) the majority of the participants 48.8% (n=61) of the respondents are from the Utilities Administration staff. Others, 28.8% (n=36) classified themselves simply as a "Government Employee", whilst the two categories of Clerical Staff 12% (n=15) and Customer Service Representative 4.0% (n=5) came in the third and fourth positions. Heads of Department and IT services both accounted for 3.2% (n=4) of the sample.

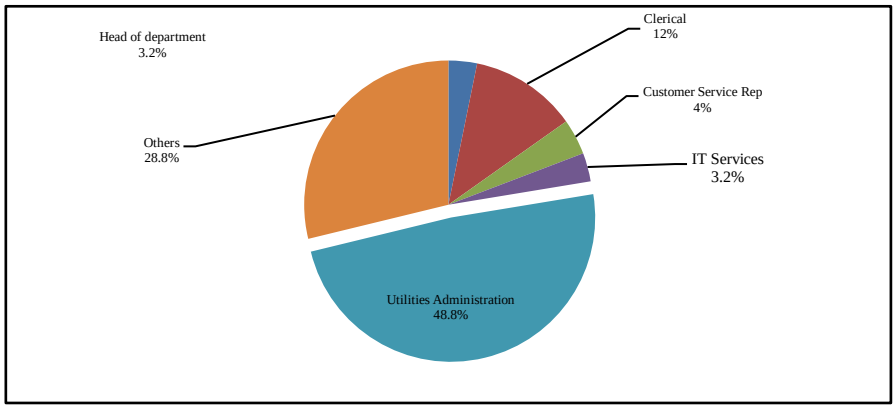

Figure 6: Participants' Current Position Distribution

The participants were asked to indicate their level of education based on three levels (please refer to Table (15) above to see the distribution of education levels). It was thought that the participants' education might influence their opinions of the e-service as well as the service provider principally. This makes us believe that employees' education background are important to understand in order to intensification successful of public e-service implementation and use. As shown in Figure (7), the majority of the respondents, 57.6% (n=72) hold a Bachelor's degree, followed by high school holders, 34.4% (n=43), finally 8% (n=10) have an intermediate school degree.

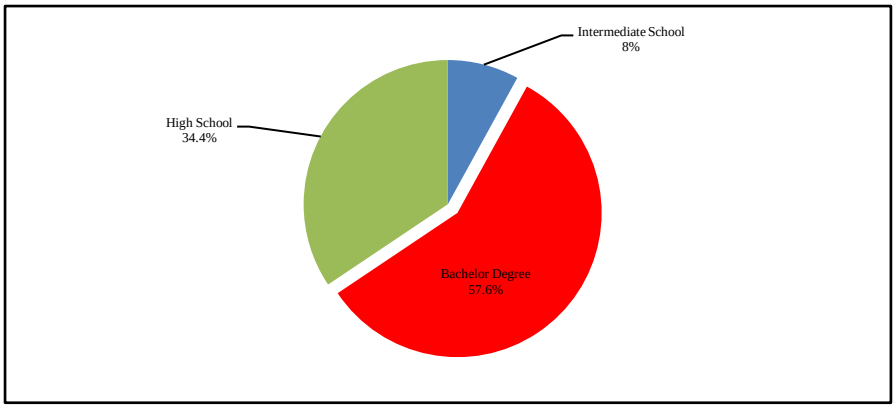

Figure 7: Participants' Educational level Distribution

Table (15) continues by showing that the majority of the staff, 41.6% (n=52) had working experience in the public originations of 6 - 10 years, followed by 16-20 years 24.8% (n=31) of working experience. 19.2% (n=24) of the staff had working experience of between 11-15 years inside the organisation. Only 14.4% (n=18) had working experience between 1-5 years. These results are summarized in Figure (8) below. The results revealed that staff had enough experience, inside the organisation to contribute in developing and improving performance in e-government systems.

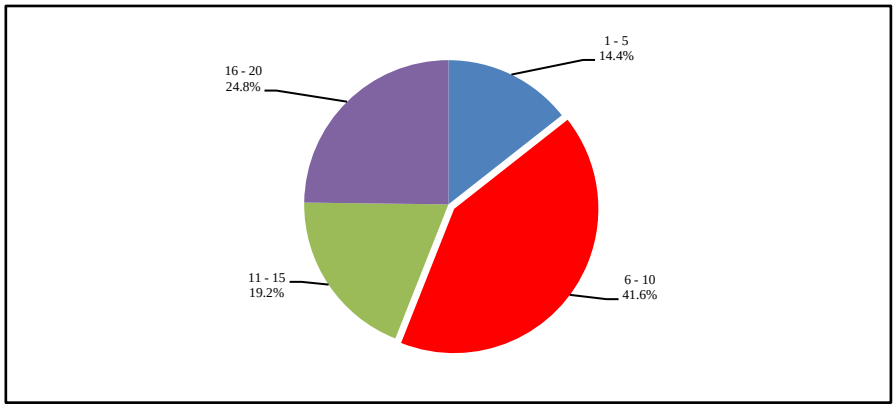

Figure 8: Participants' Working Experience Distribution

When the training courses for the IT undertaken by the staff were investigated these were divided into training courses for general IT and advanced training courses. The resultant Figure (9) below, reveal that 64% (n=80) staff had completed 1-3 courses for general IT, whereas 8.0% (n=10) staff had participated in 4-6 courses for general IT. Only 4 staff (3.2%) had attended 7-10 training courses for general IT. Regarding advanced training courses the results clearly show that a high percentage of staff, 75.2% (n=94) indicated that they need more training courses for IT. It is clear that training on the use of "Government Electronic Systems" is required to address the reluctance of staff to use these systems.

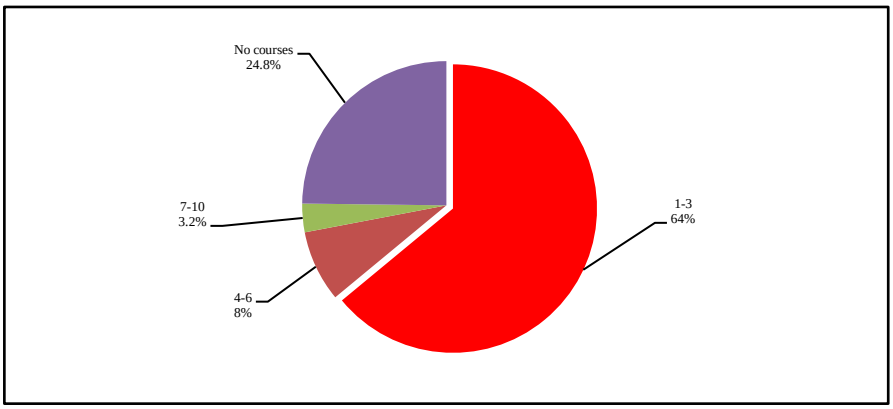

Figure 9: Training Courses for General IT Distribution

4.2.4 Staff General Attitudes toward E-Government and Readiness

In this section a descriptive analysis will be presented to show staff attitudes towards e-government in K.S.A and its future needs. This section contains twelve statements with Likert-type scale; (Strongly Disagree (1), Disagree (2), Partly Agree (3), Agree (4), Strongly Agree (5). As well as the identifying code assigned. Table (13) shows a summary of the staff responses.

Code	Statement		SA	A	PA	D	SD	Mean	S.D
			5	4	3	2	1		
GA 1	Improve management and support decision making process.	F	13	80	4	28	-	3.62	.948
		%	10.4	64.0	3.2	22.4	-		
GA 2	Reducing operations cost of services delivery and communications between government and citizens, business and employees.	F	28	79	-	18	-	3.94	.896
		%	22.4	63.2	-	14.4	-		
GA 3	Improving the efficiency of government services.	F	42	55	28	-	-	4.11	.743
		%	33.6	44.0	22.4	-	-		
GA 4	Reducing amount of time spent on government services delivery.	F	-	108	4	13	-	3.76	.627
		%	-	86.4	3.2	10.4	-		
GA 5	Quick processing and response to citizen's needs and expectations.	F	-	93	26	6	-	3.70	.557
		%	-	74.4	20.8	4.8	-		
GA 6	More organised government business process.	F	28	81	16	-	-	4.10	.588
		%	22.4	64.8	12.8	-	-		
GA 7	Increase the exchange of data between organisations.	F	59	62	-	4	-	4.41	.661
		%	47.2	49.6	-	3.2	-		
GA 8	Allow the organisation to do businesses more effectively.	F	52	68	5	-	-	4.38	.563
		%	41.6	54.4	4.0	-	-		
GA 9	Improve the connection within and between organisations.	F	38	54	28	5	-	4.00	.833
		%	30.4	43.2	22.4	4.0	-		
GA 10	Enhance the ICT infrastructure	F	28	66	27	7	-	3.92	.799
		%	22.4	52.8	19.2	5.6	-		
GA 11	Developing new skills and motivations for staff.	F	17	80	-	28	-	3.69	.971
		%	13.6	64.0	-	22.4	-		
GA 12	Increase the organisation's productivity.	F	50	63	5	7	-	4.25	.779
		%	40.0	50.0	4.0	5.6	-		

SA= Strongly Agree, A= Agree, PA= Partly Agreed, D= Disagree, SD= Strongly Disagree, S.D= Standard Deviation

Table 16: Distribution of Staff General Attitudes

In Statement (GA1) "Improve management and support decision making process" All of the staff responded to this statement and most of them agreed 64.0% (n=80), while 22.4% (n=28) disagreed, followed by 10.4% (n=13) who strongly agreed and only 3.2% (n=4) partly agreed. Overall the mean score for this statement was 3.62 and S.D was 0.948. In Statement (GA2) "Reducing operations cost of services delivery and communications between government and citizens, business and employees." All of the staff responded to this statement and again most of them agreed, 63.2% (n=79), while 22.4% (n=28) strongly

agreed, followed by 14.4% (n=13) who disagreed. Overall the mean score for this statement was 3.94 and S.D was 0.896.

In Statement (GA3) "Improving the efficiency of government services" All of the staff responded to this statement and most of them agreed, 44.0% (n=55), while 33.6% (n=42) strongly agreed, followed by 22.4% (n=28) who partly agreed. Overall the mean score for this statement was 4.11 and S.D was 0.743.

In Statement (GA4) "Reducing amount of time spent on government services delivery" All of the staff responded to this statement and the majority of them 86.4% (n=108) agreed, while 10.4% (n=13) disagreed, only 3.2% (n=4) partly agreed. Overall the mean score for this statement was 3.76 and S.D was 0.627.

In Statement (GA5) "Quick processing and response to citizen's needs and expectations" All of the staff responded to this statement and again the majority of them 74.4% (n=93) agreed, while 20.8% (n=26) partly agreed, with only 4.8% (n=6) disagreeing. Overall the mean score for this statement was 3.70 and S.D was 0.557.

In Statement (GA6) "More organised government business process" All of the staff replied to this statement and most of them agreed 64.0% (n=81) or strongly agreed 22.4 (n=28). Only 19 partly agreed. Overall the mean score for this statement was 4.10 and S.D was 0.588.

In Statement (GA7) "Increase the exchange of data between organisations" All of the staff responded to this statement and most of them agreed 49.6% (n=62), followed by 47.2% (n=59) who strongly agreed, and only 4 who disagreed. Overall the mean score for this statement was 4.41 and S.D was 0.661.

In Statement (GA8) "Allow the organisation to do businesses more effectively" All of the staff responded to this statement and again most of them 54.4% (n=68) agreed, followed by 41.6% (n=52) who strongly agreed, and only 5 who partly agreed. Overall the mean score for this statement was 4.38 and S.D was 0.563. In Statement (GA9) "Improve the connection within and between organisations" All of the staff responded to this statement and most of them 43.2% (n=54) agreed, followed by 30.4% (n=38) who strongly agreed, while 22.4% (n=28) partly agreed and only 4.0% (n=5) disagreed. Overall the mean score for this statement was 4.0 and S.D was 0.833.

In Statement (GA10) "Enhance the ICT infrastructure" All of the staff responded to this statement and most of them 52.8 % (n=66) agreed, followed by 22.4% (n=28) who strongly agreed and 27 who partly agreed: 31 of the staff disagreed with this statement. In Statement (GA11) "Developing new skills and motivations for staff" All of the staff responded to this

statement and again the majority of them 64.0% (n=80) agreed, while 22.4% (n=28) disagreed, followed by 13.6% (n=17) of the staff who strongly agreed. Overall the mean score for this statement was 3.69 and S.D was 0.971. In Statement (GA12) "Increase the organisation's productivity" All of the staff responded to this statement and most of them 50.0% (n=63) agreed, followed by 40.0% (n=50) who strongly agreed, while 5.6% (n=7) disagreed. Only 4.0% (n=5) partly agreed. Overall the mean score for this statement was 4.25 and S.D was 0.779.

Those staff members, who answered the previous statements about the expected benefits from the adoption of e-government systems in Saudi Arabia in general, and within the organisations or departments in particular, were asked to describe the maturity and readiness level of e-government systems. The survey results, Figure (10), show the majority of the respondents 68.8% (n=86) confirmed that "The maturity level is high, employing e-government system required technologies and applications". While the rest of the respondents, 31.2% (n=39) stated that there is a level of maturity, but it is still in the early phases of e-government systems (creating websites and publishing static information).

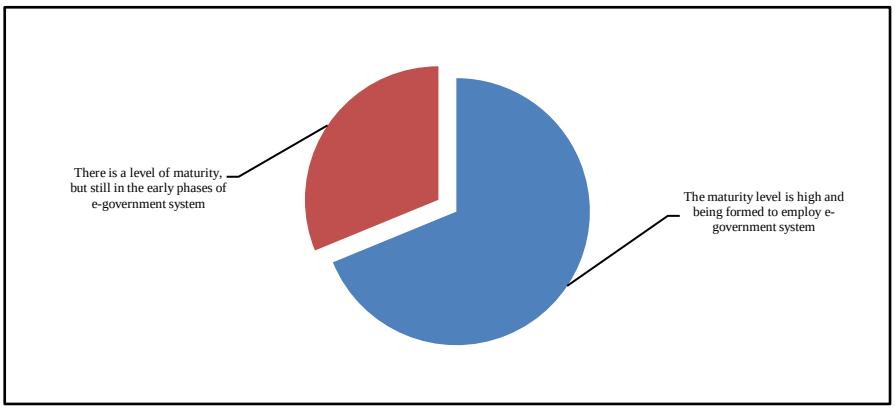

Figure 10: Maturity and Readiness Level of E-government

4.3 Constrains within Technological Infrastructure

ICT Infrastructure: This part of the questionnaire was designed to illustrate the current state of ICT infrastructure within government organisations, considering aspects such as; "Hardware, Software", ICT infrastructure penetration, and the main problems with the current ICT infrastructure. As indicated in the table (17) the participants were asked to comment upon the availability of appropriate hardware, which is a part of the assessment of the ICT Infrastructure. It transpired that 52.8% of participants (n=66) agreed that their organisation/department has up to date hardware, while the other 47.2% (n=59) of participants stated that their organisation/department does not have the most up to date

hardware. Regarding software availability: A proportion of 66.4% (n=83) stated that their organisation/department have networked computers with up to date software.

The other 33.6% (n=42) of participants stated that their organisation/department does not possess networked computers with up to date software.

	Factor	SubFactors		Freque	Percent
ICT Infrastructure	Up to Date Hardware	Yes		66	52.8
		No		59	47.2
	Networked Computers with Up to Date Software	Few computers used for word processing.		12	9.6
		Few networked computers used only for MIS and email.		23	18.4
		Fully networked computers with applications on central server in the organisation data center.		18	14.4
		Fully networked computers with applications on central server in state data center.		13	10.4
		No Computers with Up to Date Software.		59	47.2
	ICT Progress	Very good progress.		40	32.0
		Somewhat proper ICT infrastructure progress.		14	11.2
		Slow progress since the lack and shortage of funds.		71	56.8
	Problems of ICT Infrastructure	Integration problems (e. g. integrating data residing in multiple databases throughout the organisation, connecting the applications and processes within and between organisation	Yes	105	84.0
			No	20	12.0
		Unreliable networks and communication infrastructure.	Yes	96	76.8
			No	29	23.2
		The required technologies and applications for e-government implementation are not compatible with existing applications and systems in the organisation due to their complexity.	Yes	95	76.0
			No	30	24.0

Table 17: Distribution of the ICT Infrastructure

Among those staff who answered that their organisation/department has networked computers with up to date software, it was found that 18.4% (n=23) confirming that their organisation/department have networked computers with up to date software only for MIS use such as (documents, the application of people, technologies, and procedures used by the

organisation to solve problems and email. A total of 18 respondents (14.4%) stated that their organisation/department has networked computers with applications in the organisation's data centre. A further 13 respondents (10.4%) stated that their organisation/department has networked computers with applications on servers in a state data centre. The remaining 9.6% (n=12) stated that they had a limited number of computers used only for limited tasks such as word processing as shown in Figure (11).

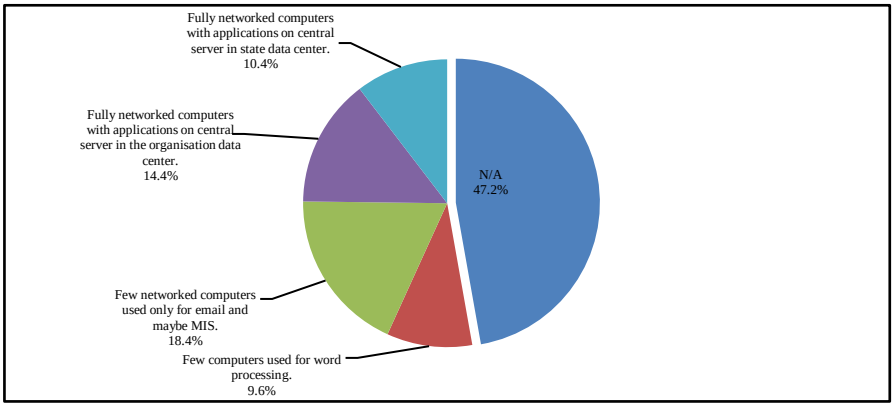

Figure 11: Distribution of the Networked Computers with Up to Date Software

For ICT infrastructure (Progress and Development), the participants were asked to give their comments and opinions about the current state of progress and development for ICT within the organisation/department. It transpired that 56.8% of participants (n=71) reported that development and progress within the organisation/department is slow due to lack of funds; others 32.0% (n=40) of participants indicated that that development and progress within the organisation/department is very good, with 11.2% (n=14) commenting that the ICT infrastructure development and progress within the organisation/department is fair, as shown in Figure (12).

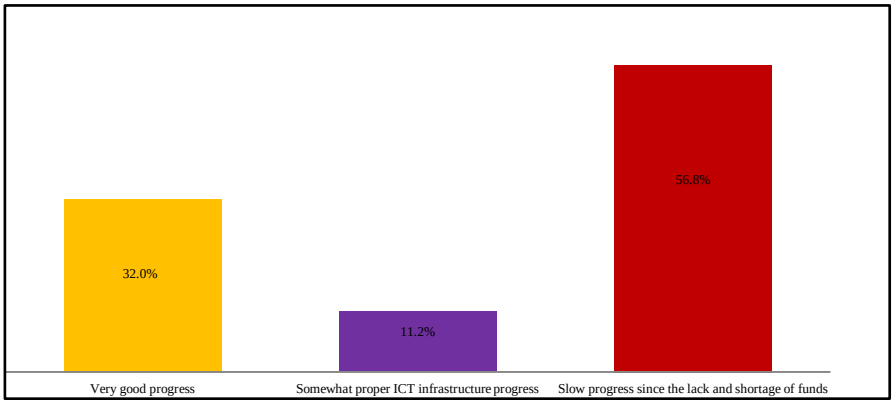

Figure 12: ICT Infrastructure (Progress and Development)

Statistical analysis of the perceptions towards currently perceived problems in ICT infrastructure was performed on the questionnaire data. The survey results illustrating that the majority of the respondents, 84.0% (n=105) believe that integration problems, such as dealing with data residing in multiple databases and connecting applications and processes within and between organisation departments, is a major hurdle to be overcome.

Network Infrastructure: This part of the questionnaire was designed to illustrate the current state the network Infrastructure within government organisations, such as Intranet communication, types of Internet connection, and access conditions to the Internet as shown in Table (18) below.

	Factor	SubFactors	Frequen	Percent
Network Infrastructure	Intranet Communication	Yes	74	59.2
		No	51	40.8
	Type of Internet Connection	Modem dial-up – dedicated to Internet and e-mail.	-	-
		Modem dial-up – shared with other functions, e.g., fax, telephone.	25	20.0
		Broadband – cable.	49	39..2
		Organisation/ Department have no Internet connection.	-	-
	Access condition to the Internet	Individual employees have Internet access through a municipal network.	-	-
		The Organisation / Department have Internet access through network or departmental stand-alone systems.	37	29.6
		The Organisation / Department share Internet access through single stand-alone system.	59	47.2
		Employees obtain work-related Internet access through home or personal computers.	29	23.2

Table 18: Distribution of the Network Infrastructure

Regarding the availability of Intranet communication as a part of ICT infrastructure, 59.2% (n=74) of the participants believed that their organisation/department uses Intranet communication as a part of their ICT infrastructure. The remaining 40.8% (n=51) of the participants did not think that their organisation/department makes use of Intranet communication.

As indicated in the Table (18), the participants were asked to give their comments and opinions on the access conditions to the Internet within their organisation/department. For this 47.2% of participants (n=59) reported that they share Internet access through a single stand-alone system; while others 29.6% (n=37) of participants indicated that their Internet

access connection is through network or departmental stand-alone systems. Finally 23.2% (n=29) obtained work-related Internet access through their home or personal computers.

With regard to those staff that answered that their organisation/department has an Intranet communication as a part of ICT infrastructure, the table (19), shows the results of further questioning on the importance of Intranet communication to the organisation/department.

In Statement (1) ("Improving the communication and coordination between employees within the Organisation/Department"); all of the staff replied to this question and most of them agreed, 42.4% (n=53), while 40.8% (n=51) partly agreed and only 16.8% (n=21) strongly agreed. Overall the mean score for this statement was 3.76 with a S.D of 0.723. In Statement (2) ("Enhance the quality of decision making process in the Organisation/Department management"); all of the staff replied to this statement with most of them in agreement, 48.0% (n=60). A proportion, 40.8% (n=51) partly agreed with only 11.2% (n=14) in strong agreement. Overall the mean score for this statement was 3.70 with S.D 0.660.

	Items		SA	A	PA	D	SD	Mean	S.D
			5	4	3	2	1		
Important of Intranet Communication	Improving the communication and coordination between employees within the Organisation / Department.	F	21	53	51	-	-	3.76	.723
		%	16.8	42.4	40.8	-	-		
	Enhance the quality of decision making process in the Organisation / Department management.	F	14	60	51	-	-	3.70	.660
		%	11.2	48.0	40.8	-	-		
	Empowerment the government data access and knowledge sharing at all levels in Organisation / Department.	F	10	61	51	3	-	3.62	.668
		%	8.0	48.8	40.8	2.4	-		
	Reduce the costs and time of content development, duplication, distribution and usage.	F	60	14	51	-	-	4.07	.943
		%	48.0	11.2	40.8	-	-		

SA= Strongly Agree, A= Agree, PA= Partly Agreed, D= Disagree, SD= Strongly Disagree, S.D= Standard Deviation

Table 19: Important of Intranet Communication

In Statement (3) ("Empowering the government data access and knowledge sharing at all levels in Organisation/Department"); all of the staff replied to this statement. Again most of them were in agreement, 48.8% (n=61), with 40.8% (n=51) partly agreeing, followed by 8.0% (n=10) in strongly agreement and only 2.4% (n=3) disagreed. Overall the mean score for this statement was 3.62 and S.D was 0.668. In Statement (4) ("Reduce the costs and time

of content development, duplication, distribution and usage"); all of the staff replied to the statement and most of them strongly agreed 48.0% (n=60), 40.8% (n=51) partly agreed, follow by 11.2% (n=14) who agreed. Overall the mean score for this statement was 4.07 and S.D was 0.943.

Information Systems Infrastructure: Information Quality, System Quality, and Services Quality: This part of the questionnaire was designed to illustrate the current maturity level of information available on the organisation's website which is a part of the information systems within government organisations and will reflect on the level of integration as indicated in Table (20).

	Items		SA	A	PA	D	SD	Mean	S.D
			5	4	3	2	1		
Information System Infrastructure (information quality, system quality, andservices quality)	Information on the organisation's website is free from errors.	F	32	70	15	-	8	3.94	.978
		%	25.6	56.0	12.0	-	6.4		
	Information on the organisation's website is up-to-date.	F	32	58	28	7	-	3.92	.839
		%	25.6	46.4	22.4	5.6	-		
	Information on the organisation's website is relevant to the site.	F	31	85	-	9	-	4.10	.728
		%	24.8	68.0	-	7.2	-		
	Information on the organisation's website is easy to read and understand.	F	32	29	64	-	-	3.74	.842
		%	25.6	23.2	51.2	-	-		
	The organisation's website always works correctly.	F	-	65	29	31	-	3.27	.836
		%	-	52.0	23.2	24.8	-		
	The organisation's website provides necessary information and forms to be downloaded.	F	20	60	31	14	-	3.69	.875
		%	16.0	48.0	24.8	11.2	-		
	The organisation's website provides necessary transactions to be completed and allows forms to be submitted on-line.	F	33	64	18	10	-	3.96	.856
		%	26.4	51.2	14.4	8.0	-		
	The organisation's website provides helpful instructions.	F	-	53	43	29	-	3.19	.790
		%	-	42.2	34.4	23.2	-		
	The organisation's website is secured.	F	31	68	26		-	4.04	.677
		%	24.8	54.4	20.8		-		
	The organisation's website is accessible to users with disabilities.	F	29	64	-	32	-	3.72	1.09
		%	23.2	51.2	-	25.6	-		

SA= Strongly Agree, A= Agree, PA= Partly Agreed, D= Disagree, SD= Strongly Disagree, S.D= Standard Deviation

Table 20: Information System Infrastructure

In Statement (1) ("Information on the organisation's website is free from errors"): All of the staff replied to this statement and most of them agreed, 56.0% (n=70), or strongly agreed 25.6% (n=32). A further 15 partly agreed and 8 strongly disagreed). Overall the mean score for this statement was 3.94 and S.D was 0.978. In Statement (2) ("Information on the organisation's website is up-to-date"): All of the staff replied to this statement and most of

them agreed 46.4% (n=58) or strongly agreed 25.6% (n=32). The remaining 35 either partly agreed or disagreed. Overall the mean score for this statement was 3.92 and S.D was 0.839.

In Statement (3) ("Information on the organisation's website is relevant to the site"): All of the staff replied to this statement and most of them again agreed, 68.0% (n=85) or strongly agree 24.8% (n=31). Only 9 disagreed. Overall the mean score for this statement was 4.10 and S.D was 0.728. In Statement (4) ("Information on the organisation's website is easy to read and understand"): All of the staff replied to this statement and most of them only partly agreed, 51.2% (n=64). The remaining strongly agreed, 25.6% (n=32) with only 29 in agreement. Overall the mean score for this statement was 3.74 and S.D was 0.842.

In Statement (5) ("The organisation's website always works correctly"): All of the staff replied to this statement and most of them agreed, 52.0% (n=65) or partly agreed 23.0% (n=29). On the other hand 24.8% (n=31) disagreed. Overall the mean score for this statement was 3.27 and S.D was 0.836. In Statement (6) ("The organisation's website provides necessary information and forms to be downloaded"): All of the staff replied to this statement and again most of them were in agreement, 48.0% (n=60), 24.8% (n=31) partly agreed, followed by 16.0% (n=20) in strong agreement and only 11.2% (n=14) disagreed. Overall the mean score for this statement was 3.69 and S.D was 0.875.

In Statement (7) ("The organisation's website provides necessary transactions to be completed and allows forms to be submitted on-line"): All of the staff replied to this statement and most of them agreed- 51.2% (n=64) or strongly agreed- 26.4% (n=33). A further 18 partly agreed and only 10 disagreed with this statement. Overall the mean score for this statement was 3.96 and S.D 0.856. In Statement (8) ("The organisation's website provides helpful instructions"): All of the staff replied to this statement and again most of them agreed- 42.4% (n=53), 34.4% (n=43) partly agreed, while 23.2% (n=29) disagreed. Overall the mean score for this statement was 3.19 and S.D was 0.790.

In Statement (9) ("The organisation's website is secured"): All of the staff replied to this statement and the majority 54.4% (n=68) agreed, followed by 24.8% (n=31) who strongly agreed, while 20.8% (n=26) partly agreed. Overall the mean score for this statement was 4.04 and S.D was 0.677. In Statement (10) ("The organisation's website is accessible to users with disabilities"): All of the staff replied to this statement and most of them agreed-51.2% (n=64), while another 25.6% (n=32) disagreed. The rest, 23.2% (n=29), strongly agreed. Overall the mean score for this statement was 3.72 and S.D was 1.09.

Those staff who answered the previous statements (information quality, system quality, and services quality) for their organisation/department were further asked to elucidate on their organisation/department's attitudes towards feedback collected from citizens or business in relation to e-government services: A total of 61 respondents (48.8%) indicated that the feedback collected from citizens or business is handled on a monthly basis. Only 30.4% (n=38) indicated that the organisation/department collected the feedback from citizens or business whenever the organisation/department needed it. While the remaining respondents answered that feedback is taken quarterly. Additionally, the survey results show that 76.0% (n=95) of the respondents confirmed that their organisation uses the feedback to take corrective measures in order to improve the e-government system and services provided. The rest of the respondents (n=30) (24.0%) stated that their organisation did not use the feedback to take corrective measures.

Security Infrastructure: This part of the questionnaire was designed to capture the current maturity level of security available on the organisation's website and also to find out the security technologies and approaches applied within the organisation/department, Table (21) below.

Statement		Frequency	Percent %
Reliable security systems have been configured to ICT infrastructure and organisation e-government website.	Yes	110	88.0
	No	15	12.0
Somewhat reliable systems that protect the ICT infrastructure but they need more adjustments and new protection technologies for organisation website.	Yes	101	80.8
	No	24	19.2
Unreliable security systems and experiencing of many security holes in the ICT infrastructure and lack of necessary technologies for protecting the organisation web site contents.	Yes	98	78.4
	No	27	21.6

Table 21: Distribution of the Security Infrastructure

As indicated in Table (21) the participants were asked to give their comments and opinions about the security systems for the ICT infrastructure within their organisation/department. The purpose of this question was to highlight the level of the security; a low level would reflect negatively on e-government systems.

The survey results, illustrate that the majority of the respondents 88.0% (n=110) stated "Reliable security systems have been configured to the ICT infrastructure". Also the participants indicated that the security technologies and approaches, which have been applied to protect the ICT infrastructure and the website contents include; Public Key Infrastructure (PKI), Biometrics systems, Smart Cards, Digital Certificate, and Firewalls.

4.4 Concerned Issues of Organisational Behaviour towards E-government

Strategy and Planning: This part of the questionnaire was designed to determine the current strategy and planning available within government organisations that will reflect on the level of readiness and adoption, Table (22) below.

	Factor	SubFactors	Frequency	Percent %
Strategy and Planning	Clear vision and realise the significance of adoption e-government system.	Yes	98	78.4
		No	27	21.6
	Set up a strategy plan for adoption e-government system?	Yes	125	100.0
		No	-	-
	Future strategic action plan for the implementation of the e-government system	Expand the existing ICT infrastructure in the organisation.	24	19.2
		Strength the security systems of e-government website by installing new protection technologies and approaches to provide secure transactions.	19	15.2
		Incorporate advanced ICT features and tools to the e-government website such as online payment system, online customised public profile, data transfer technology, and electronic records and knowledge management.	61	48.8
		Generate citizen interactive conversations area through email systems or online forums with constituents or government officials.	-	-
		Focus on the integration issue by connecting data, processes and applications between the government organisations.	21	16.8
	Level of support towards the adoption of e-government system?	There is an active commitment and support from top management who pushed toward adoption of e-government and able to provide the necessary funds.	86	68.8
		There is somewhat commitment and support from top management to the adoption of e-government and it is not sufficient throughout the process of implementation.	39	31.2
		In most cases the top management pays no attention to the adoption process of e-government.	-	-

		There is no commitment and support from top management to the adoption of e-government and sometimes they restrict the process of implementation.	-	-
	The Financial and resource planning process link appropriately to objectives and strategic priorities	Yes	98	78.4
		No	27	21.6
	Cooperation with the other local Organisation / Department?	Yes	93	47.7
		No	32	25.6

Table 22: Strategy and planning

As indicated in the Table (22) the participants were asked to give their comments on strategy and planning issues related to e-government.

The results shown in the survey, Table (22), indicate that 98 respondents (78.4%) stated that their organisation / department has a clear vision and understand the significance of e-government system adoption, Some others 21.6% (n=27) of participants stated that their Organisation / Department does not have a clear vision. A follow up question asked the participants if there is any strategy plan for moving to the adoption of e-government systems; all the participants 100.0% (n=125) confirmed that their organisation/department has a set up strategy plan for the adoption of e-government systems.

The staff were further asked to clarify what is the future strategic action plan for the implementation of the e-government system: Figure (13) shows that the majority of the respondents 61% (n=48.8) stated that the strategic action plan for the implementation of e-government system is to "Incorporate advanced ICT features and tools to an e-government website such as online payment system, online customised public profile, data transfer technology, and electronic records and knowledge management". A further 24 respondents (19.2%) stated that the plan is "to expand the existing ICT infrastructure in the organisation". Next 21 respondents (16.8%) confirmed that the intention is to "Focus on the integration issues by connecting data, processes and applications between the government organisations". Only 19 respondents (15.2%) affirmed that the plan is to "Strengthen the security systems of e-government website by installing new protection technologies and approaches to provide secure transactions".

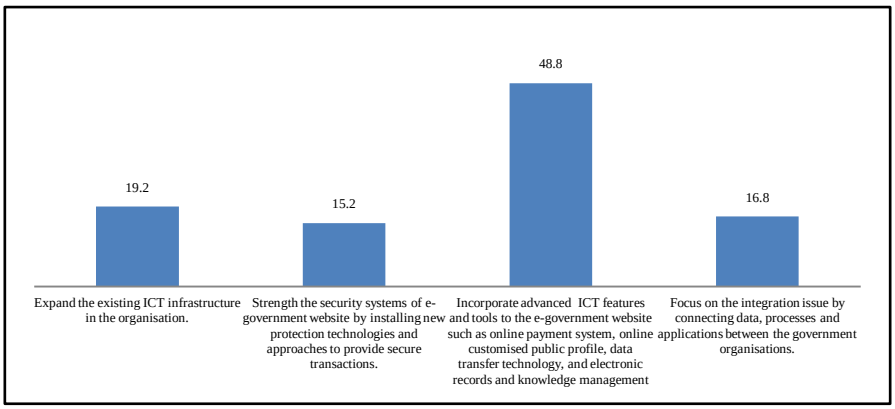

Figure 13: Future Strategic Action Plan

The participants were also asked to comment on the level of support for the adoption of e-government within the organisation/department. The results, Figure (14), illustrate that the majority of the respondents 88.0% (n=110) confirmed that there is full support and commitment from top management pushing toward the adoption of e-government and the necessary funds are available.

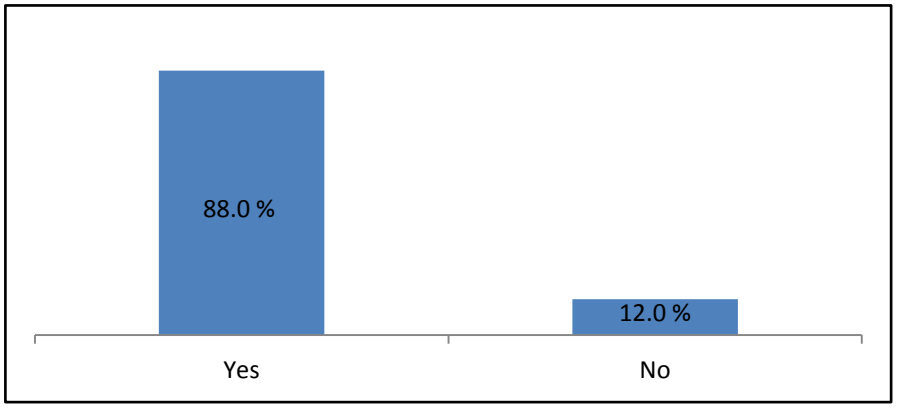

Figure 14: The Level Support towards the Adoption of E-government

The results investigation shows that the majority of the respondents 78.4% (n=98) confirmed that the financial and resource planning process links appropriately to the objectives and strategic priorities of the organisation. Meanwhile others 21.6% (n=27) comment that this link is missing in their organisation. At the same time 74.2% of participants (n=93) reported that there is a full cooperation with other local organisations in terms of sharing data and other aspects related to the e-government services and government organisations.

Awareness and Human Resources Development: The main purpose of this section is to gather information about current levels of awareness and to measure the amount of staff training if they had received sufficient training regarding e-government in the Saudi Arabia government organisations, as shown in Table (23) below.

	Factor	SubFactors	Frequency		Percent %
Awareness and Training	Aware of any e-government system	Yes	84		67.2
		No	41		32.8
	Trained to use e-government system	Yes	78		62.4
		No	47		37.6
	Type of training	Beginners/introduction	56		44.8
		Intermediate	6		4.8
		Specific training	16		12.8
		No training	47		37.6
	Place of training	Private Training Institute	21		16.8
		State recommended Training Facilities	37		29.6
		Department Training Facilities	20		16.0
		Department of Information Technology	-		-
		Not responded	47		37.6
	ICT Training Strategy	There is a clear vision for the importance of training strategy and top management supports this vision and understand the needs of such training courses for the organisation's staff.	Yes	26	20.8
			No	99	79.2
		The training strategy plan for the organisation is set up but not completely followed it due to the lack of support from top management to staff	Yes	46	36.8
			No	79	63.2
		There is no training strategy plan in the organisation / department.	Yes	90	72.0
			No	35	28.0

Table 23: Awareness and Human Resources Development

The first issue in this part attempted to measure the current level of awareness; the survey results Figure (15) show that the majority of respondents 67.2% (n=84) were aware of initiatives and e-government programmers within their organisation. On the other hand 32.8% (n=41) are unaware of any initiatives or e-government programmers within their organisation.

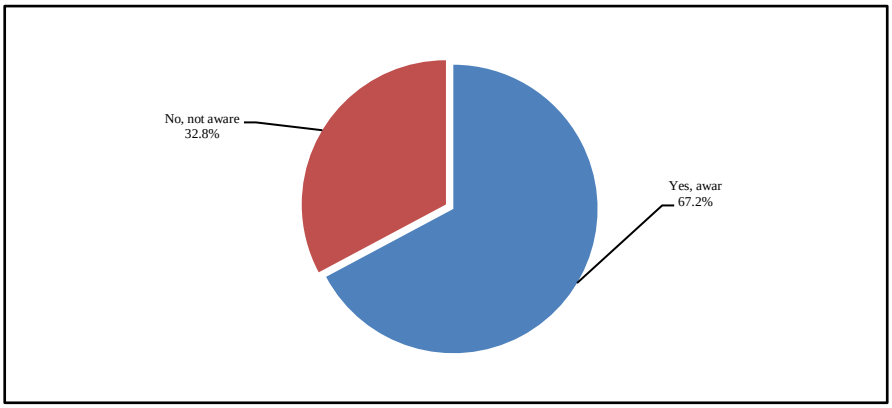

Figure 15: The Current Level of Awareness

A follow up question was posed “Have you ever been trained to use e-government systems”: Only 62.4% (n=78) have received any formal training to use the systems. The rest of the participants’ had not been trained to use the systems. Figure (16)

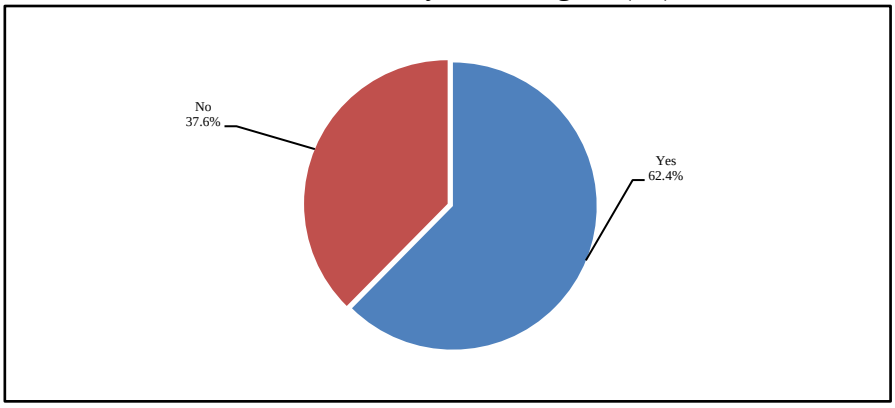

Figure 16: Formal Training

Of those staff who have received formal training, they were asked them to clarify “what type of training they had received and where”; the survey results indicated that staff did not receive enough formal training to use e-government systems.

The result point out that the majority of the respondents 44.8% (n=56) stated that training they received was basic or an introduction in how to use the system without any further follow up to the staff. 16 respondents (12.8%) stated that they had received specific training to use the systems. Only 6 respondents (4.8%) confirmed that the training was intermediate or as necessary.

On the other hand; 29.6% (n=37) stated that their organisation/department conducts ICT training courses for staff at recommended training facilities by top management, a total of 21 respondents (16.8%) stated that the training they received was at a private institute. 20 respondents (16.0%) stated that the training they received was at organisation/department facilities. As indicated in Table (23) the participants were asked to describe the ICT training strategy that has been applied within their organisation/department. In particular the survey results, illustrate that the majority of the respondents 72.0% (n=90) stated that the training strategy plan for the organisation is set up but not completely followed, due to a lack of support from top management.

4.5 Advanced Statistical Analysis on the Organisation Readiness

This section aims to analyse the survey results to investigate the impact of readiness factors and sub-factors on the organisation readiness and usage of e-government services.

Significance of Technological Aspects: "Technological Aspects" focuses on the assessment of the existing technology infrastructure (hardware, software, Network Infrastructure, Information systems Infrastructure, and security Infrastructure). This analysis of the significance was based on chi-square using SPSS statistical package to test and determine if there is a statistical association between Technological factors (hardware, software, Network Infrastructure, Information systems Infrastructure, and security Infrastructure) and the organisation readiness for e-government.

	Sub-Factors	Mean	SD	P-value (t-test)
Technological Aspects	Up to date Hardware	1.34	.474	<0.001*
	Up to date Software	1.34	.474	<0.001*
	Intranet Communication	1.41	.493	<0.001*
	Information System	4.04	.474	<0.001*
	Security Infrastructure	1.12	.326	<0.001*

Table 24: Significance of Technological Aspects
"*" Significant at P≤0.05, S.D (Standard deviation)

As indicated in Table (24) the chi-square test results show that, hardware, software, Network communications, Information systems, and security Infrastructure are statistically significant (P= ≤ 0.05), which has a direct effect on the organisation's readiness for successful adoption and readiness to use e-government in the public sectors.

On the other hand, Information systems Infrastructure as described above is considered as an important factor that affects the readiness of using e-government services within public organisations with Mean=4.04 and S.D.474.

Significance of Organisation Aspects: "Organisation Aspects" focuses on the assessment of the existing support and human development within government organisations in order to improve the alignment with government goals. This analysis of the significance was based on chi-square using SPSS statistical package to test and determine if there is a statistical association between Organisation factors (Top Management Support, Strategy and Planning, Human Resources Development, and Awareness and Motivation) and the organisation readiness for e-government.

	Sub-Factors	Mean	SD	P-value (t-test)
Organisation Aspects	Top Management Support	1.22	.413	<0.001*
	Strategy and Planning	1.12	.326	<0.001*
	Human Resources Development	1.79	.408	<0.001*
	Awareness and Motivation	1.33	.471	<0.001*

Table 25: Significance of Organisation Aspects
"*" Significant at P≤0.05, S.D (Standard deviation)

As illustrated in Table (25) the chi-square test results show that Top Management Support, Strategy and Planning, Human Resources Development, and Awareness and Motivation had statistical significance. Additionally, Human Resources Development is considered an important aspect for the readiness of using e-government services within public organisations with Mean=1.79 and S.D 0.408.

4.6 Presentation and Analysis of the Interviews (Qualitative Analysis)

4.6.1 Motivations to Pursue an Adoption of E-government in Saudi Arabia

The adoption of e-government systems in Saudi Arabia requires that all citizens, organisations and business have the capacity to carry out their activities electronically. Empirical research (in Chapters 2 and 3) has shown that there are many reasons to pursue and adopt e-government systems in Saudi Arabia. These reasons include: technical, social, economic, as well as political. According to one of e-government team members interviewed as part of the research: *"A government's primary reason for being, apart from guaranteeing law and order in society, is to serve its people. In the past this has been done through manual processes and counter services and within the limited time of office hours. With the advent of computers, computer systems, the internet and ease of computer access it is now possible to serve people without the constraints of time, physical location, or physical form such as submitting paper forms. This provides benefits such as: cost savings, convenience, consistency of service, and government reaching out to citizens as individuals."*

The findings from this fieldwork have shown that all the interviewees believed Saudi Arabia needs to pursue and adopt e-government systems as a new tool to develop and improve the services provided by government organisations through increasing its performance and productivity as well as providing high quality services to stakeholders. They also stated that it can help in saving time and effort, simplifying procedures, improving transparency, eliminating bureaucracy, improving services delivery, as well as increasing the government organisations efficiency and effectiveness. One of the e-government team members in this research also stated that: *"E-Government is the government itself with the new face, new mind set, and new channels to access the government services. Hence, E-Government is not an option. It is the only way to pursue."* The findings from the fieldwork additionally showed that some of the interviewees believed that the major purpose of e-government systems is to reduce the red tape within government organisations as well as help stakeholders avoid the difficulty of dealing with the complex procedures within government organisations.

4.6.2 The Strategic Alignment for E-government Initiative in Saudi Arabia

The strategy in Saudi Arabia of an e-government initiative is focused on a number of aspects that all revolve around the central notion of providing better government services to all, (citizens, businesses and government organisation). The Saudi e-government program is to be implemented incrementally, in phases. Each phase is implemented under the provisions of a strategy and action plan detailing the key thrusts of each phase. The actual implementation of the strategy and action plan is in the form of projects undertaken by organisations with assistance from Yesser. Phase 1, covering the period 2006 to 2010, emphasizes the building of the e-Government information infrastructure and the implementation of key services: This strategy is divided into 10 key goals or objectives, which are to be achieved by the implementation of the initiative. The key goal objectives are: To provide the one hundred and fifty top-priority services at a world-class level of quality electronically; To deliver services in a seamless and user-friendly way at the highest standards of security; To make services available to everyone in the Kingdom and allow 24/7 access from cities as well as the countryside, even from outside the country; To achieve a 75% adoption rate with respect to the number of users; To ensure an 80% user satisfaction rating for all services provided electronically; To deliver all possible official intra-governmental communication in a paperless way; To ensure accessibility of all information needed across government agencies and storage of information with as little redundancy as possible; To purchase all goods and services, above a reasonable value threshold, through e-procurement; To contribute to the establishment of the information society in the Kingdom by spreading information, knowledge and the use of e-services; and to help improve the use of the country's assets and resources by increasing society's productivity in the private, business and public sectors. One of e-government team members confirmed that: *"The program established a 5 years strategic plan that ended in December 2010. Right now we are in the 2nd strategy and action plan which covering the period 2012 to 2016. The new strategy is focused on 6 work streams (E-Services, Infrastructure, National Applications, Human Capital Communication & Change Management, Participation & Engagement, Institutional Framework).*

The second strategy and action plan, which covers the period 2012 to 2016, was divided into 22 key goals/objectives which are to be achieved by the implementation of the initiative: Establish and maintain an effective and skilled workforce for e-government in KSA; maintain e-government leadership by ministers and senior executives across organisations; create performance based culture across e-government workforce using performance and

achievement based Human Capital Management; increase e-government awareness among all government employees; improve collaboration and increase knowledge exchange relating to e-government; ensure an effective regulatory environment for e-government achievement and measurement; manage risks for successful delivery; implement standardized business processes and promote single sources of data; develop e-government channels to match citizen demand; improve communication from government agencies to citizens; improve service delivery performance against standards and expectations; transform how organisations deliver services through business processes and the use of e-services; increase the use of ICT tools for communication between government agencies and citizens (e-participation); build capacity for e-government research and innovation; improve management of suppliers/vendors of e-government and technology services; reduce the cost of accessing government services; improve quality of e-services – choice, availability and service levels; increase customer awareness of e-services; increase customer satisfaction, making e-services a first choice leading to growing usage of e-services; drive out duplication of government ICT investment; increase the indirect value of government ICT investment; and finally to contribute to the establishment of the information society in KSA, including innovation and growth of the local ICT sector.

According to the fieldwork, reported upon here, some experts' are not convinced by this strategy and process and they believe that there are many aspects yet to be addressed. Others experts feel that such a strategy lacks perspective and does not advance beyond outlining the role of government organisations. One of the e-government team members confirmed that: *"The adoption process is rolling, slower than it should but picking speed as the reports on E-Readiness reach the cabinet of ministers and questions appear on the table. It is easy to isolate three groups of government sectors in the adoption process (Pioneers, Followers, and Lagers). The pioneers started before Yesser. The followers are learning from others success stories and proceeding. The lagers are waiting until they have to move. I think we have 10%, 60%, and 30% in the same sequence."*

4.6.3 Limitation of Technological Readiness

This section will discuss the issues related to technology readiness in Saudi Arabia from two perspectives (national level perspective and organisation level perspective).

An e-government project requires an ICT infrastructure, which is technologically advanced to cover the whole country, and provide affordable services to all people. In Saudi Arabia substantial funding has been applied to the implementation of ICT throughout the

government infrastructure and an advanced infrastructure in now available to most of the public organisations. However, in terms of e-government the overall integration environment is probably as important as the national infrastructure. Regarding the internet in Saudi Arabia there are barrier to the dissemination information, which is controlled by complex technological issues and equipment. One of the interviewees commented: *"The ICT sectors in KSA are still poorly developed. Most ICT development projects do not meet their full potential simply because there are not enough qualified and experienced ICT industry people—from good managers to good technical implementers".* Another stated: *"...the ICT in infrastructure in Saudi Arabia is too slow compared to the capabilities and the needs. I think CITC has to put more efforts to address the pain areas, like broadband availability and mobile coverage. Especially in rural areas, MCIT needs to put serious efforts in categorizing ICT vendors, system integrators, and consultants to facilitate selection".*

At the organisational level, within the public organisations in Saudi Arabia, the findings of this study illustrate that there are some exceptionally strong ICT organisations. The majority, however, have limited ICT capability and are using out-dated implementation technologies. There also seems to be a preponderance of adopting a "trial-and-error" approach to implementing day-to-day ICT tasks such as software maintenance and upgrades. This leads to issues of service performance and lack of trust between business owners and ICT to the degree that many do not even use an agency's common systems such as email.

One of e-government team members confirmed that: "*I think that lots of efforts and resources have gone into automation. But, little or no effort went into integration and collaboration. This is the gap, Yesser is closing right now. But, the biggest capacity issue today is the level of reliability of the government sector's data centers today. Very few can be considered Tier-3. For E-Services, they need to be Tier-4."*

4.6.4 Organisational Readiness Related Problems

This section discusses the issues related to organisational readiness in Saudi Arabia.

E-government means transforming organisations from the traditional model of doing business to a new electronic model of business. Ordinarily organisations are not easily transformed, and during any transformation process the organisation's essential defining elements need to be taken into account. Therefore, in this section important issues such as organisation characteristics, strategy and planning, and human resources, are discussed.

Organisation Characteristics encompass an organisation's structure, culture, and size, which form complex concerns for e-government readiness. The analysis of the fieldwork data indicates that the above characteristics are requiring a high degree of consideration particularly in the early stages of developing an e-government system. In this regard all of the interviewees agreed that the organisation's characteristics could present benefits regarding the implementation and adoption of the e-government systems in the government organisations in Saudi Arabia. Moreover, in the case of the government organisations in Saudi Arabia there is a need to reconsider the organisation characteristics to fit with the requirements of e-government services. Regarding this point one of the e-government team commented that: *"Understanding organisations was one of the most important challenges we faced during the first phase of developing the system with many organisations and it's was required at the all level of the development."*

The interviews confirmed that the adoption of e-government system and readiness within the government organisations in Saudi Arabia is dependent on the organisational structure in place. Cultural issues require more attention during the development of e-government systems and are considered to be one of the most complex issues in dealing with change. The majority of the interviewees agreed that organisational culture is a major barrier to change in e-government, which required many changes and the replacement of an old management system and structure with a new system. Regarding this point one of the e-government team commented that: *"The convictions and beliefs from the officials as well as staff within the government organisations regarding e-government that it will reduce their administrative powers and eradicate of favouritism make the closing doors culture are prevalent in most government organisations."*

Strategy and Planning, including organisational vision, leadership support, IS strategy, funding/budget, BPR, legislations, and data sharing, refers to the long term vision, which will support the government or organisations to outline the future changes required to adopt any new development in technology: The analysis of the fieldwork data indicates that transformation to e-government is not an easy process, and there are many elements that must be taken into account. Furthermore, the support of government leaders is a very important factor in the process of change. There are major challenges in building the capacity of government employees to take advantage of new processes and understand the reasons for the change and their roles in the new government environment created. Regarding this point one of the e-government team commented that: *"Successful implementation of e-Government*

depends on alignment among an organisation Strategy its (Vision, Mission and Goal), the business processes, and the organisation ICT strategy. It also depends very much on skilled manpower in the business units and the ICT department of the organisation." Another member of e-government team commented that: *"An organisation embarking on the journey towards e-government transformation needs to build its strategy then it needs to build its Enterprise Architecture to align business processes, customers, ICT and human capital needs. Once the Strategy and the EA are in place then detailed action plans can be developed to ensure projects get implemented and monitored through the Project or Program Management Office."*

Human Resources Development such as training on the use of new technology is the key to success at the individual level or the organisations level. Moreover, the development of people working in the field of electronic services, within government organisations in line with the project requirements, through training is considered as a successful fundamental for any electronic government project. Some government organisations, however, do not consider training important for their employees, either for lack of financial allocations for training or because there is no alternative in the absence of the employee. A member of e-government steering committee commented that: *"Education and training is undoubtedly a strong factor for the uptake of e-Government. However the implementation of an education and training program for e-Government poses specific challenges including the large numbers to be trained, the wide geographic spread of the country, and the lack of good trainers."* Moreover, in terms of higher-level management training, a member of the e-government steering committee commented that the training in e-government services for public organisations top management is considered a very important aspect of the e-government initiative project. He stated that: *"...we are facing difficulties in Yesser with the vertical day after day. We started three levels of training: (CIO level training, Professional level training, and Staff training).* Also he mentioned that: *"...in Yesser We completed two runs on the CIO level training and had more than 60 people attend. We also did project management, and enterprise architecture training for the middle management and professionals. We also completed 10,000 people training for government staff, and another 80,000 on the way."*

4.6.5 Issues Related to Environmental Readiness

This section will discuss the issues related to environment readiness in Saudi Arabia. In this section the important cultural, economic and political issues related to environment readiness are discussed.

The Culture: Understanding the culture is an important aspect that affects e-government. Moreover, culture and society in Saudi Arabia have been affected by worldwide developments. The majority of the interviewees indicated that cultural differences, in terms of beliefs and behaviour, as well as the attitudes towards technology, are creating more obstacles and challenges for the adoption and readiness of e-government in Saudi Arabia. The majority of interviewees' highlighted some other points regarding cultural issues in Saudi Arabia: Behaviours and attitudes towards ICT such as the lack of Knowledge in dealing with information, and low levels of awareness, the low level of acceptance of new innovations as well as trust in government organisations. A member of e-government steering committee commented that: *"Definitely that entrench the culture of the use of e-government services its importance among the citizens and residents and will increase from being used as each will raise the level of productivity in government agencies that provide these services."*

Moreover, the analysis of the fieldwork data indicated that, in the case of e-government systems in Saudi Arabia, the need for a high level of awareness during e-government implementation as well as among citizens was an important factor that will increase the citizens and residents capability to participate and use the electronic services, as well as increasing the productivity of business within government organisations.

Economic: Today, the Saudi Arabian economy is growing fast and it is in its best performing period as witnessed by a great transformation in different aspects of the inhabitants' economic life. It has transferred to a modern economy led by the petroleum and petrochemical sectors, as well as agricultural, commercial and banking sectors to strengthen the economy. As a result of this strong economy, the government of Saudi Arabia has the capacity to build a very strong infrastructure adapted to new technology. Therefore, Saudi Arabia, as a part of this world trend, is looking to develop in many technological fields, and the development of the ICT infrastructure within the country was a main target and top priority. In the past few years, the development in the IT sector witnessed severe changes: For a long time there was limited use of computers in government organisations with very few applications, but, due to the boom in information technology, many government sectors considered are now involved in the ICT revolution. Moreover, the analysis of the fieldwork

data indicated that, in the case of e-government systems, the government of Saudi Arabia has been spending a lot of money to establish and implement an e-government system. A member of e-government steering committee commented that: *"Given the strength of the Saudi economy and recognising the importance of e-government and its role in increasing the productivity and well-being a royal order was issued to the Ministry of Communications and Information Technology to develop a plan for the delivery of government services electronically."*

Political: Political support is required for most projects and with e-government projects in particular it is a crucial issue for e-government readiness and implementation. Without effective political leadership, financial resources, and internal coordination between government organisations the planning and implementation of e-government will not be achieved. Therefore, the 2003 Royal Decree directive to the Ministry of Communications and Information Technology (MCIT) proposed a plan to transfer traditional government services and transactions to be online via the Internet. Furthermore, in 2005 the Ministry of Communications and Information Technology (MCIT), in conjunction with the Ministry of Finance and the Communication and Information Technology Commission (CITC), established the E-Government Program, called Yesser. A member of the e-government steering committee commented that: *"By the royal decree number 40, every government organisation with an independent budget should have an E-Government committee headed by the first or the second person in command. All these committees are linked directly to Yesser to align the efforts and utilize the frameworks and standards and methodologies developed by Yesser to facilitate the E-Transformation journey."*

4.7 Discussion

Examination of the statistical significance between demographic characteristics, and citizens' readiness to use e-government according to age, gender, education level, and monthly income shows that the citizens readiness to use e-government in the Saudi Arabia differ significantly in terms of age and education level, and monthly income. Likewise the analysis of the existence of network infrastructure in terms of rate of Internet connection, and rate of Internet prices shows that there was a statistically significant effect on the use of e-government, while the type of Internet connection was not statistically significant. On the other hand security, privacy, and credibility in technology in general and e-government systems in particular have a statistically significant effect on the citizens' readiness. The analysis of the IS infrastructure elements (information quality, system quality, and services quality) shows a statistically

significant effect on the citizens' readiness for all factors. Moreover, findings from the Citizens' survey identified more factors such as awareness of e-government, IT training, number of computers in organisations for public use and citizens satisfaction. These factors also have a statistically significant effect on the citizens' readiness to use e-government services.

In addition, findings from the descriptive statistics imply that all the constructs are rated and this concludes that the respondents showed strong agreement with factors included in the study for examining the readiness to use e-government services. The findings from the survey show that hardware, software, network communications, Information systems, and security Infrastructure have statistically significant effects on the organisations' readiness for successful adoption and use of e-government in the public sectors. On the other hand, Information systems Infrastructure is considered an important factor further affecting the readiness of e-government services. The finding from the survey further show that top management support, strategy and planning, human resources development, and awareness and motivation are statistically significant having a direct effect on the organisation readiness for successful adoption and use of e-government in the public sectors.

In view of the above explanation it can clearly be understood that there is a need of an effective assessment readiness mechanism for an e-government system. This can further explain the existence of constrains of e-government posing threats in its implementation. In this work, based on these findings, a novel model for an e-government readiness assessment is proposed. The focus of the next chapter is to explain in detail components of the proposed model.

4.8 Summary

The selection of an appropriate research methodology is the second most important stage after the research aims, objectives, and research questions. Therefore, to find an appropriate result regarding this research the researcher has used different research methodologies as well as an intensive review of the literature. Therefore, in this chapter the researcher highlighted the technique that has been used to address the aims and objectives and answer the research questions mentioned in Chapter one of this thesis. With the use of convergent parallel mixed-methods research methodology, quantitative and qualitative data are collected respectively by using a survey questionnaire and interviews. Collected survey and interview data also have been analysed with a comprehensive discussions of the analysis of survey and interview data.

Chapter Five: A Multi-Layer Framework for Assessing E-government Information System

5.1 Introduction

In the light of the previous discussion it is clear that e-government lacks an effective standard readiness assessment mechanism. As part of the work, presented in this thesis, a novel readiness assessment framework to enhance e-government (EGISR), principally in Saudi Arabia, is proposed. The benefits of the proposed scheme (EGISR) outlined in Figure 17 are; (I) It is easy to understand and use, (II) It provides comprehensive guidelines, associated tools, and a systematic approach to assess the readiness level of e-government systems, (III) It can be used for multiple purposes such as; (a) An architecture guideline, which addresses more than the single dimension of e-government readiness assessment. (b) A checklist for what's implemented now and what's in the future plan and can easily be turned into a measurement tool for the readiness level of the government organisations, and (IV) It can be used as a strong awareness tool for government leaders to give an holistic view of the state of e-government in their jurisdiction. The distinct elements of this framework are derived from the literature and based on available assessment methods, such as e-readiness measures, e-government readiness assessments, and information system metrics, where it can be observed that these elements have a high significance impact on practically assessing e-government readiness and guiding its implementation. In this context, this chapter will detail EGISR and its components. It is important to mention that this framework has not been developed just according to the results of the fieldwork but also to the previously conducted literature review. Therefore, relevant parts of the proposed scheme are linked with previous studies (Zarei et al, 2008; Hameed, 2009; Freeman, 2010; Gonzalo, et al 2011; Venkatesh et al, 2012;Valdés, Pardo et al, 2012;Yuan et al, 2012; Xu, Jingjun et al, 2013; Hung et al, 2013; and Nograšek and Vintar, 2014) wherever appropriate.Therefore, the rest of this chapter is organised as follows; The Technology Readiness Layer section; which explains and discusses several issues that could influence e-government readiness and implementation. The Organisation Readiness Layer section, which details the factors that could influence organisational readiness and the implementation of e-government. The People/Stakeholders Readiness Layer section, highlights influences on People/Stakeholders' readiness to use e-government. The Environment Readiness Layer section, which assesses environment

constraints on readiness to use e-government. Finally the chapter ends with a summary and conclusion.

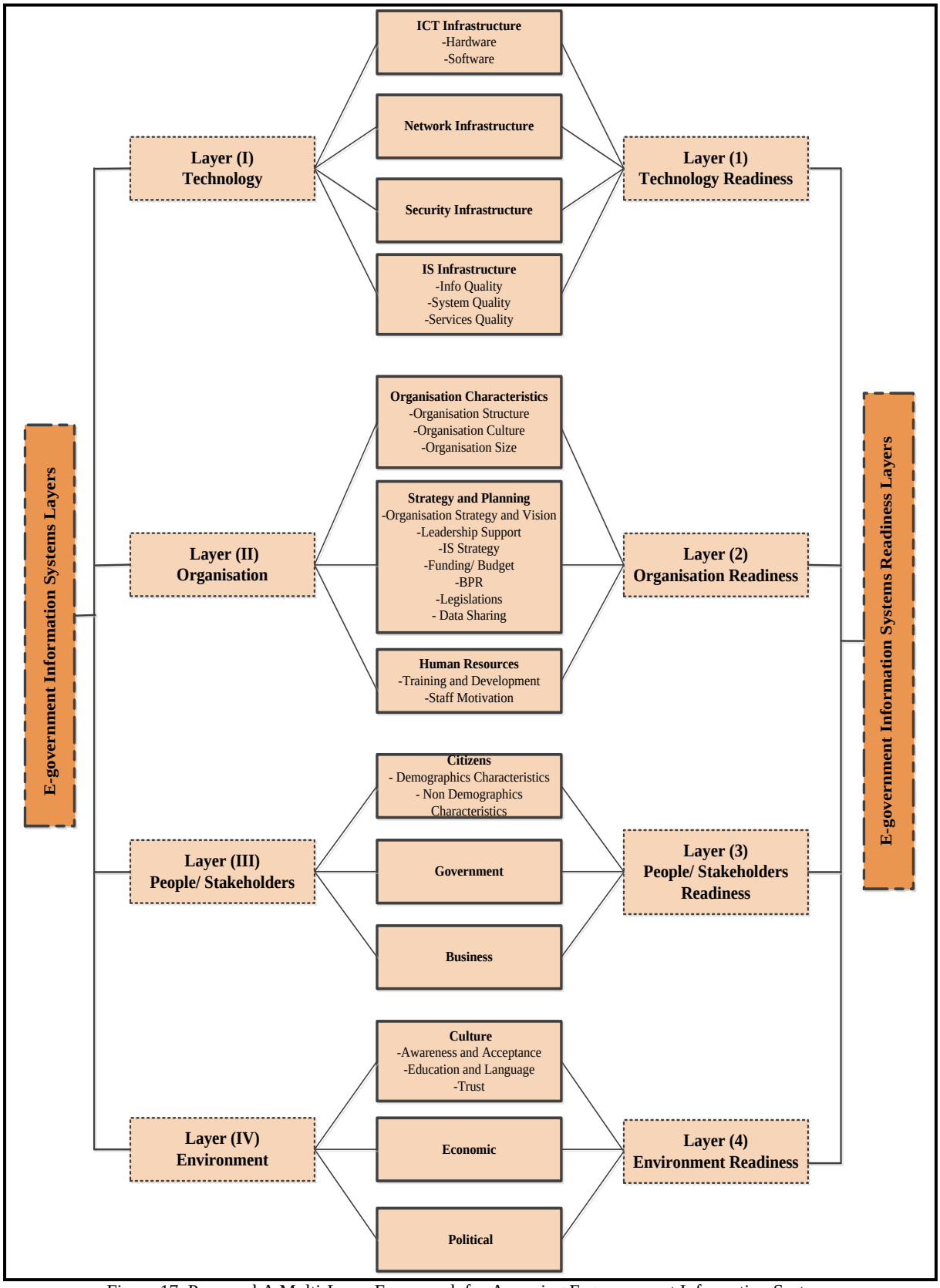

Figure 17: Proposed A Multi-Layer Framework for Assessing E-government Information System

5.2 The Technology Readiness Layer

The main purpose of this layer is to assess the overall readiness of technological characteristics. Therefore, this technological dimension has been divided into four sub-layers: (I) ICT Infrastructure: (Hardware, Software), (II) Network Infrastructure, (III) Security Infrastructure, and (IV) Information System (IS) Infrastructure as outlined in Figure (18). Using the elements mentioned, a good technological platform for e-government readiness will be established.

It can easily be understood that the technology readiness layer has significant benefits over some of the known work in this area. Thus, using this layer the government will be able to monitor and evaluate the operation mechanism both at the national and at the project level.

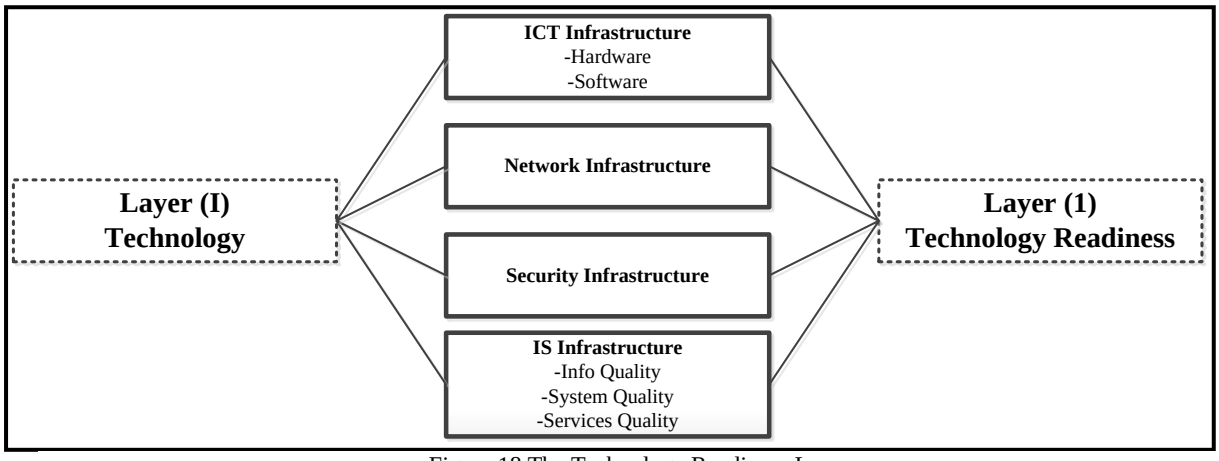

Figure 18 The Technology Readiness Layer

5.2.1 Sub-layer (I) ICT Infrastructure

As previously discovered in the fieldwork, the state of ICT Infrastructure is one of the major factors affecting e-government services at all levels. Such components ought to be fully ready if the government is looking to move towards the adoption of e-government. However, provision of up to date technology, in both hardware and software, remains a key challenge for developing countries around the world (Venkatesh et al, 2012; Hung et al, 2013).

To this end, this sub-layer has been divided into two elements: (1) Hardware and (2) Software. The hardware is any device that can be used to connect and increase the accessibility to the Internet such as: smartphones, laptops, personal computers, and desktops and also any technology that can be used to support and enhance the use of e-government. Software is the collection of software applications or any products that can be used to support and improve the use of e-government.

5.2.2 Sub-layer (II) Network Infrastructure

Since the early days of the Internet many studies have confirmed that it has a significant role in the socio-economic development of developing countries (Nguyen, 2007; Nkwe, 2012). Therefore, in terms of e-government, network infrastructure is a major factor that drives people to participate, use, and access e-government services. According to (Nguyen, 2007) network infrastructure is defined as *"the very basic necessary condition for Internet access"*. To this end, the assessment of the Network Infrastructure within this research is based on four elements: (I) Type of Internet Connection/Speed, (II) Rate of Internet Connection, (III) Rate of Internet Prices/Cost, (IV) the Access condition to the Internet within the public organisations.

5.2.3 Sub-layer (III) Security Infrastructure to Protect Data Exchange and the Website Contents

The aim of this sub-layer is design to assess readiness levels of security within organisation as well as to protect data exchange and the website contents. The assessment was based on two elements; (I) security technologies/approaches such as public key infrastructure (PKI), biometrics systems, electronic signature, smart cards, passwords, digital certificate, firewalls, and (II) information security policies applied within the organisation/departments. The key benefit of sub layer is to enable the framework design. Moreover, the common involvement of many government organisations about information security are often designed, developed and installed on a strategic basis. There is often no analysis of the long-term strategy that can be perceptibly to support the goals and requirements for government.

Security Infrastructure for e-government to protect data exchange and the website contents is one of the most important and significant elements for the progress of e-government. According to (NSTISSC, 2010) *"Information systems security is the protection of information systems against unauthorised access to or modification of information whether in storage, processing, or transit, and against denial of service to authorized users, including those measures necessary to detect, document, and counter such threats".* Security Infrastructure should satisfy the major security requirements such as availability, integrity, accountability, confidentiality, and information assurance (Joshi J et al, 2001). On the other hand exchanging data and information between government organisations or departments requires a high security level in order to protect the citizens' information and government transactions. Consequently, building a high security infrastructure for e-government should

include public key infrastructure (PKI), biometrics systems, electronic signature, smart cards, passwords, digital certificate, firewalls as well as a clear information security policy (Löfstedt 2005; L et al, 2011; Karokola et al, 2012).

5.2.4 Sub-layer (IV) Information System Infrastructure (ISI): (Information Quality, System Quality, and Services Quality)

Information Systems Infrastructure (ISI) in general and e-government systems in particular, have many significant concerns as well as complex issues that are not easy to solve without well-built infrastructure. Therefore, as mentioned above, in the literature review, the core aim of any system is to be able to describe as briefly as possible what is going on inside the system itself as a fundamental ability for the system. This is very important when assessing how the system is currently operated as well as for describing how it will operate (McDermid, 1999). Today all stakeholders are expecting better services from the government to be completed over the Internet. Moreover, the review of the literature confirmed that information system infrastructure such as information quality, system quality, and services quality are significant elements which affect stakeholders' enactment through the usage of e-government services. According to (Petter et al, 2008) System Quality (SysQ) aims to measure the characteristics of the information system such as ease of use, system reliability, system flexibility, and ease of learning, as well as system features of intuitiveness, flexibility, sophistication, and response times, While Information Quality (InfQ) aims to measure the characteristics of the system outputs; such as relevance, understandability, conciseness, accuracy, completeness, currency, usability, and timeliness.

On the other hand, Service Quality (SrsQ) aims to measure the quality of the support that system users receive from the IS department and IT support personnel such as responsiveness, reliability, accuracy, technical competence, and empathy of the personnel staff. As government's promise to develop a system with high quality to deliver their services to all stakeholders then the assessment of the readiness of this system will be required at all levels. To this end, this sub-layer is designed to assess readiness levels of Information System Infrastructure (ISI). The assessment of the Information System Infrastructure is based on three elements; (I) Information Quality (IQ) (II) System Quality (SysQ), and (III) Services Quality (SerQ). Therefore, the assessment of information quality focuses on the characteristics of the information provided and the availability of a government portal with characteristics such as comprehensibility, accuracy, completeness, security, timeliness, as

well as availability, while the assessment of the system quality focuses on the performance characteristics of the system such as: reliability, usability, adaptability, maintainability, trust, and response time. On the other hand, the assessment of the services quality focuses on the value of the service provided by the system that the stakeholders will receive, such as reliability, availability, integrity, efficiency, and functionality. Therefore, the assessment of the system should be conducted at different levels; the personnel level, the technical level, and the semantic level where all stakeholders are involved to take a part at each respective level (Esteves and Joseph, 2008; (Yuan et al, 2012; Xu Jingjun et al, 2013). It is quite paramount that the undertaken mechanism, as a part of EGISR, is enabled to conduct readiness assessment at all levels something which is not, at present, offered by any of the reported work.

5.3 Organisation Readiness Layer

The main purpose of this layer is to assess the overall state of organisational readiness. The organisation layer has been divided into three sub-layers: (I) Organisation Characteristics (organisation structure, organisation culture, organisation size). (II) Strategy and Planning (organisation strategy and vision, leadership support, IS strategy, funding/budget, BPR, legislations, and data sharing), (III) Human Resources (training and development, staff motivation), see Figure (19). The understanding concept of the organisation readiness layer is to promote a well organised in-depth understanding of the essential components in due course.

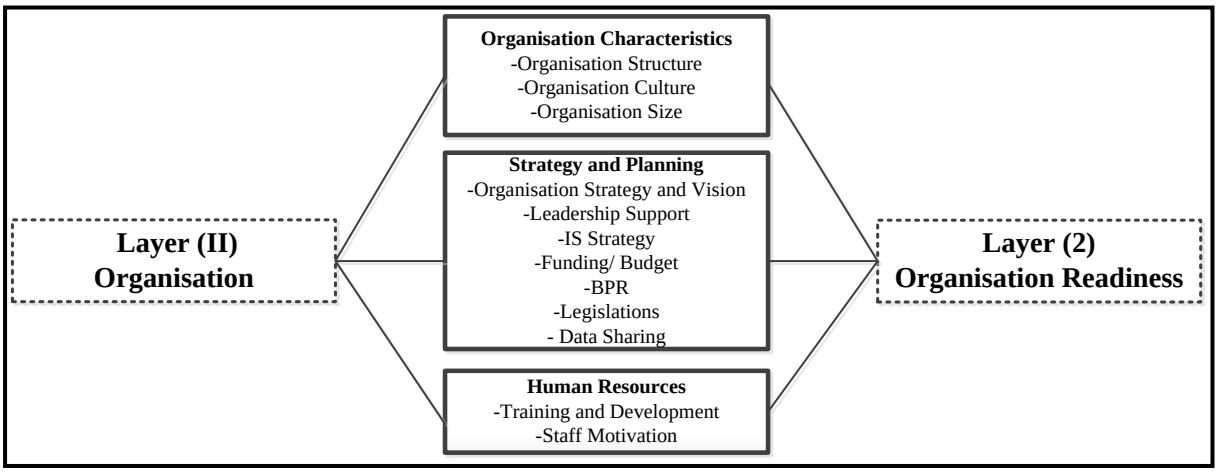

Figure 19: Organisation Readiness Layer

5.3.1 Sub-layer (I) Organisation Characteristics

The adoption of any new technology, within a public organisation, requires an understanding of the organisation's characteristics such as organisation structure, organisation culture, and organisation size. Consequently, many researchers have studied and considered organisation's characteristics and investigated the impact of these characteristics on the adoption of the technology. Organisation structure is considered as the way that an organisation divides responsibility through its structure and how it manages it (Strens and Dobson, 1994). According to (Hatch et al, 2006) organisation structure is defined as: *"the relatively enduring allocation of work roles and administrative mechanisms that creates a pattern of interrelated work activities and allows the organisation to conduct, coordinate, and control its work activities"*. On the other hand (Schein, 2010) defined the organisational culture as: *"The shared understanding of how an organisation works"*. Therefore, the adoption of new technology such e-government will have many challenges in terms of resistance to change and the sharing of information (Altameem et al, 2006). The majority of these challenges are related to the organisational culture and the views of staff that new technology may impact negatively on their jobs or will result in loss of power. Moreover, the organisation's size will also affect the organisation's readiness to implement e-government: A small organisation may believe that new technology, such as e-government, is only relevant to a big organisation and may well impact badly on their financial plan.

This sub layer serves the essential purpose of the concept of e-government as for all rather than only for big organisation with less doubt. This approach will open a border spectrum for every organisation to work into the adoption of e-government. It is important to mention that such strategy, will provide all government organisations with a clear mapping for a managerial features for e-government transformation which is most if not all missing or too complex in most of the available literature.

5.3.2 Sub-layer (II) Strategy and Planning

Strategy and planning generally refers to a long term vision which will support the government or organisation in outlining the future and changes required if they decided to adopt any new development or technology.

Therefore, a successful strategy for e-government is still in its early stages. According to (Lowery, 2001) a successful strategy for e-government should include: (I) The organisation's description of e-government including the identification of all stockholders, (II) A vision that

is simple and easy to understand; briefly expressing the organisation's concept of and plans for adoption of e-government, (III) Specific areas and goals that can be examined and assessed, (IV) Identification of policies required to support e-government, (V) A clear methodology for determining organisation readiness, (VI) A process for identifying and prioritising e-government initiatives; and (VII) A business model to sustain e-government initiatives.

According to (Basu, 2004), the main strategic objective of e-government is to support and simplify governance for all beneficiaries with new technology. These beneficiaries include: citizens, government, and businesses. This sub-layer is based on seven elements (I) organisation strategy and vision, (II) leadership support, (III) IS Strategy, (IV) Funding/Budget, (V) BPR, (VI) Legislations, (VII) and Data Sharing.

5.3.3 Sub-layer (III) Human Resources Development (HRD)

Within the e-government environment most of e-government readiness assessments involve assessing and considering the development of human resources (Ojo A et al, 2007). The adoption of e-government requires all managers and staff to be skilled and equipped for changes and the work with the new technology (Zarei et al, 2008). Moreover, the human resource role is expected to supply input into the development of this strategy for cohesion with broader human resource strategies for individual organisations as well as government as a whole (Valdés Gonzalo, et al, 2011; Pardo et al, 2012; Nograšek and Vintar, 2014). The motivation to accept e-government as a new technology is also one of these challenges which are related to staff belief that the new technology will influence their work. Indeed HRD layer plays an important role in the overall organisational progress and this shouldn't be under estimated. Therefore, this layer provides a crucial benefit and serves for this very same purpose. In this research this sub-layer, the human resources development is based on two elements; (I) training and development, (II) staff motivation.

5.4 People/Stakeholders Readiness Layer

According to (Freeman, 2010), Stakeholders are defined as *"any group or individual who can affect or is affected by the achievement of the organisation's objectives"*. While (Coakes and Elliman, 1999) defined stakeholders in the field of Information systems as: *"Someone who has an interest in Computer Information System (CIS) development and can affect the success of that development"*. In the IS discipline (Elpez and Fink, 2006) defined stakeholder as:

"Stakeholders can readily be identified as those that will ultimately use the system (end-users) and those charged with delivering those systems (IS professionals). From an end-user perspective, high usability of the system is logically linked to IS success".

According to (Esteves and Joseph, 2008) e-government stakeholders are classified as: citizens, employees, businesses, governments, IS/IT personnel or special interest groups. The People/Stakeholders has been divided into three sub-layers (as shown in Figure (20): (I) Citizens (II) Government (III) Business.

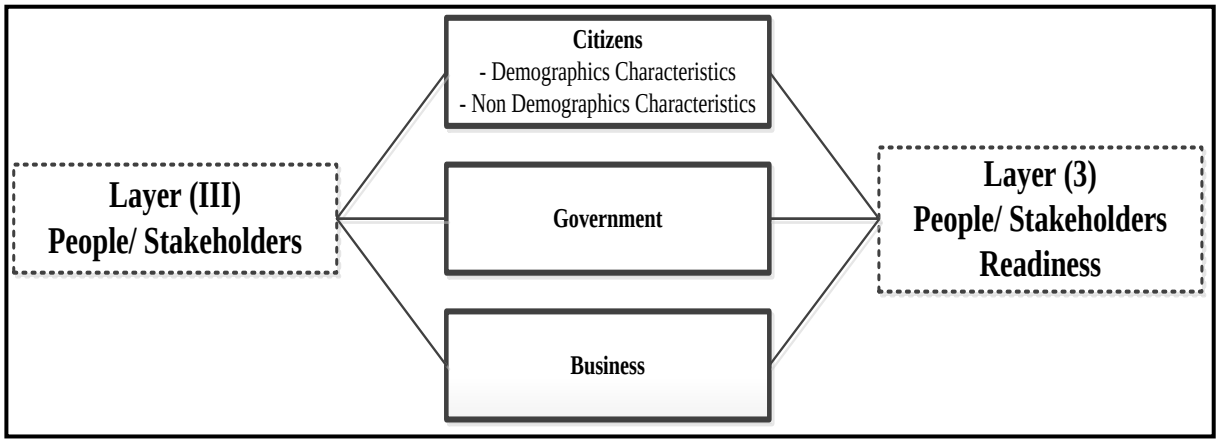

Figure 20: People/Stakeholders Readiness Layer

5.5 The Environment Readiness Layer

It can be seen that the existence of a layer to assess the context of the e-government system is crucial to exploring the readiness environment. In the available literature different methods are adopted for the same purpose. However, this particular environment layer follows a unique structure in comparison with some of the related reported literature.

Since e-government aims to provide electronic services round the clock to different people living in different places, a deep understanding of environment readiness (also known as country profile characteristics) is a fundamental aspect, which dictates best solutions since each country has its own characteristics.

According to (Bolgherini, 2007) investing heavily in technology is not enough to put government online, there are other elements that should be taken into account. These elements relate to culture, political, administrative traditions, cognitive frames and mentality as well as the country specific peculiarities which determine whether e-government initiatives succeed or fail. In (Hameed, 2009) four elements are associated with the environment. These are knowledge, economy, management, and security. While (Davison and Martinsons, 2003)

concluded that the creation of digital opportunities within all sectors requires a long term plan approach for the social and economic development of a country.

The environment layer has been divided into three sub-layers: (I) Culture (II) Economic, and (III) Political as shown in Figure (21).

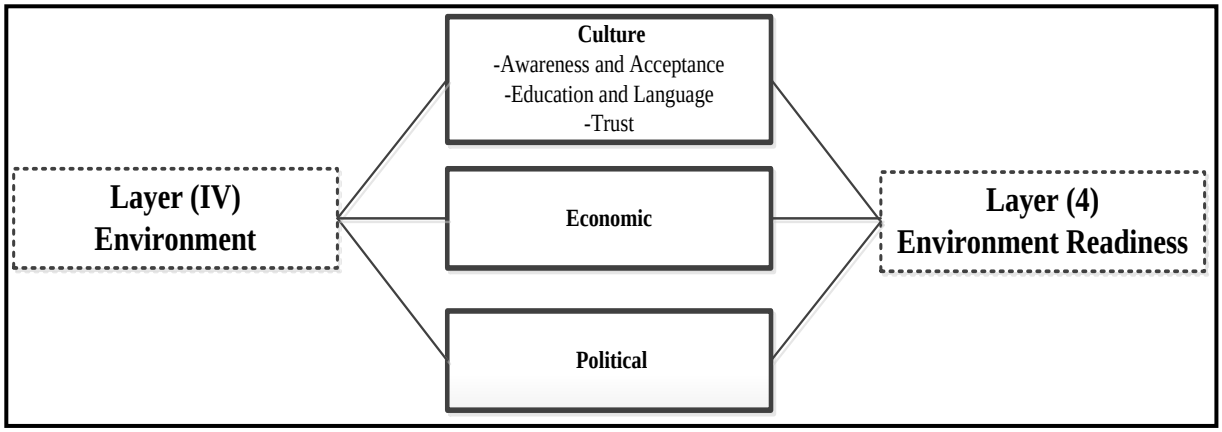

Figure 21: The Environment Readiness Layer

5.5.1 Sub-layer (I) Culture

Understanding the culture is an important aspect affecting e-government readiness. It is complex to deal with a society having different beliefs and attitudes towards any new initiative.

According to (Davison and Martinsons, 2007) *"Culture is difficult to study partially because it is not an easy concept to define"*. On the other hand (Robbins S, et al 2012) defines national culture as *"Attitudes and perspectives shared by individuals from a specific country that shape their behaviour and the way they see the world"*. Moreover, (Hill, 2011) classifies culture into six elements: social structure, political system, economic philosophy, religion, language and education.

Many researchers have investigated the relationship between culture and the adoption of ICT (Khalil, 2011; Akkaya et al, 2012; Zhao, 2013). As a result, these studies show that ICT is progressively more a cross-cultural environment (Walsham, 2002). This means that a country's ICT strategy should consider its individual social and cultural characteristics as important factors. According to (Bridges.org, 2008) "*The unique cultural and historical environment of a region must be taken into account as part of a national ICT policy to truly gauge the country's e-readiness for the future".*

The assessment of the culture sub-layer within this research is based on three elements; (I) Awareness and Acceptance, (II) Education and Language, and (III) Trust.

5.5.2 Sub-layer (II) Economic

The review of the literature in field of e-government indicated that there is relationship between e-government readiness and the development of the economic state of the country (Grönlund A et al, 2009). According to (Mamaghani, 2010) the adoption information and communication technologies present important opportunities to developing countries which can play a significant role in promoting sustainable local development and reducing poverty as well as accelerating economic growth.

Therefore, for this research, the investigation of the economic impacts of e-government readiness was an important element, which has a direct effect on the use of the Internet as a tool to connect the government services as well as an economic benefit for government organisations.

5.5.3 Sub-layer (III) Political

Due to the actual nature of e-government, political support is required. Moreover, e-government is a long term project which costs a lot of money and holds political values and efficiency values for the government such as; citizen participation, public accountability, democratic responsiveness, efficiency, integrity and service quality, and security (Bwalya and Healy, 2010). It also ought to increase transparency and trust between the government and the community.

In view of the conducted research these layers are not implemented or made part of a reported scheme as they should be. It is noteworthy that any of these are integrated in a manner which will make the whole process of e-government improved.

5.6 Summary

In this chapter an explanation of the proposed comprehensive multi-layers framework for assessing e-government information system readiness (EGISR) was presented.

This is composed of four layers: Layer (I) Technology Readiness, Layer (II) Organisation Readiness, Layer (III) People/Stakeholders Readiness, and Layer (IV) Environment Readiness. The main consideration in this framework is to highlight the issues that might hinder or affect e-government readiness as well as implementation from three different

perspectives (citizens, staff, and government officials). This framework aims to reduce the complexities of the assessment process for e-government by understanding the assessment process, identifying the main requirements of ICT tools, organisation, and highlighting the importance of the stakeholders-people readiness as well as the impact of the environment readiness. Furthermore, the framework developed in this research can also help the decision makers to set a vision and strategic statement action plan for the future of e-government by identifying key factors and stages for action for e-government.

Chapter Six: Analysis and Discussion

6.1 Introduction

The aim of this chapter is to demonstrate a deeper understanding of e-government adoption readiness in the context of developing countries particularly in Saudi Arabia. The key findings of this research project are helpful for decision makers to set a vision and strategic statement action plan for the future of e-government. The proposed framework aims to reduce the complexities of the assessment process for e-government. It explains the assessment process, identifying the main requirements of ICT tools, organisations, and highlighting the importance of the stakeholders-people readiness and the impact of the environment readiness. The proposed framework can assist decision and policy makers in Saudi Arabia to deal with the issues related to the adoption and readiness process and guides them to assess the current state of the system; what has been implemented and what is still required, which can easily be turned into a measurement tool for the readiness of e-government in any particular environment. The rest of this chapter is organised as follows; section 2 highlights how the proposed architecture provides a contribution to knowledge, which enhances understanding. Section 3 focuses on the benefits of the developed architecture and how it enhances current efforts in Saudi Arabia in terms of a systematic approach, comprehensive architecture guidelines, motoring tool, reduce assessment complexities, and decision making, while a chapter summary is presented in section 4.

6.2 Enhancing Existing Knowledge

The proposed framework, developed in this research project, is based on empirical work that provides a comprehensive model for an e-government adoption and readiness. This research resulted in the classification of e-government critical factors for adoption and readiness, in relation to the context of Saudi Arabia. Therefore, a discussion of the findings with a highlight of the contextual aspects and their impact upon the adoption and readiness of e-government in Saudi Arabia is presented in the following sections.

6.2.1 Technological Enhancement

The findings in this research project highlight that the readiness of the technology context was essential for e-government adoption and readiness in Saudi Arabia. The evidence from the fieldwork confirmed that issues associated to pure technical aspects such as (ICT infrastructure i.e. hardware and software, network infrastructure, security infrastructure to

exchange data and IS infrastructure i.e. information quality, system quality, and services quality), or factors including technology processes (vision, strategy and action plans), are all significant to establish an affective technology environment to adopt e-government. The technological infrastructure, procedures and processes are all significant elements to facilitate e-government adoption and readiness. E-government ICT infrastructure comprises some advanced technologies including; application servers, web servers, PCs, printers, storage devices, firewalls, hardware and operating systems, and data and application development tools (IBM, 2011; Alghamdi et al, 2011). The storage, acquisition, and data exchange must be provided through these technologies in order to allow easy data access internally or externally to the organisation (Shareef et al, 2011; Alshehri et al, 2012; Muñoz and Bolívar, 2014).

The analysis of the fieldwork revealed that the existence of network infrastructure, in terms of rate of Internet connection, and rate of Internet prices, is an important issue on the use of e-government. The results showed that factors such as technical infrastructure, website design, quality of service, and security, influence the citizens' adoption and readiness in using e-government services in Saudi Arabia. This is in agreement with findings from (Alanezi, 2012 et al; Alateyah et al, 2013) that IS infrastructure and technology trust impact on the adoption and readiness to use e-government.

6.2.2 Organisational Context Enhancement

Changing the rules and behaviour within government organisations to replace traditional administrative procedures is considered critical stage of e-government uptake in most developing countries. A number of these changes are considered as supplementary changes to improve the progress while others are seen as fundamental (Srivastava, 2011; Pazalos et al, 2012). However they all have an important role in the process of change. Based on the findings of this research project, these aspects include: organisation structure, culture, size, strategy, vision, interaction and planning issues i.e. leadership support, IS strategy, funding/budget, BPR, legislation, data sharing and personnel challenges such as training and development and staff motivation. The analysis of the empirical data in this research confirmed the strong relationship between the adoption and readiness of e-government and the identified organisational factors.

Findings from the employees' survey and the interviews show that changing the organisations leaders and their staff is very complicated and strong resistance was encountered. The resistance took many forms. Discrimination by staff with traditionalist views against new

technology is a reality in many organisations. This has led to a lack of communication between public administrators and IT professionals, as well as between government employees and civilian IT professionals. Employees in many organisations resisted for reasons such as levels of education and lack of skills in using new technology. Further resistance, witnessed amongst managers, resulted from the fear of loss of power and control. On the other hand, the analysis of the fieldwork highlights that the structure as well as the organisation size is crucial in defining and distributing responsibilities and activities among the organisation and creates channels of communication within the organisation and its environment. Moreover, the organisation hierarchical structure has a benefit in the enforcement of the adoption and readiness of the e-government systems in Saudi Arabian organisations. Thus, there is a significant impact, for any organisation's plan to adopt e-government, in developing the right organisational structure.

In terms of the strategy and vision to adopt e-government systems, which will reflect on the readiness, each organisation planning to adopt the e-government systems is required to include in its strategy the vision, as a roadmap, on how to reach the aim of implemented of e-government (Ntaliani et al, 2010; Weerakkody, et al 2011; Niehaves et al, 2013). This roadmap can help government organisations accomplish their vision in the development of the administrative system to enhance the offering of services to e-government stakeholders. The analysis of the fieldwork highlights that some of the government officials as well as the e-government team lack a clear vision, which could negatively influence the adoption of e-government. Based on that it's very important for the government organisation, in Saudi Arabia, to link their strategy with their vision because adoption of an e-government system is a long-term project that cannot be implemented within short time periods.

From another perspective, analysing e-government in Saudi Arabia shows that the organisational top management and leadership support play a significant role in the launch of new technology within the organisation. It was confirmed that without the leadership and consent of top management, change was impossible (Reddick and Turner, 2012; Ionescu, 2013). In the case of the Saudi Arabian government the reform work processes is generally initiated as a result of decisions by top management reacting to the requirements and circumstances of the work environment that affect the organisation output and performance. In fact adoption of e-government requires strong leadership to support it at all stages. Leadership has many characteristics and dimensions; this confirmed that implementation and

readiness of e-government systems are less likely to succeed without the transformational contribution of the top leadership.

Analysis of the evidence shows that introducing e-government initiatives into public organisations in Saudi Arabia requires cooperative efforts from different government functional departments. The analysis of the fieldwork highlights that collaboration between departments and between organisations is a significant aspect that affects the readiness and adoption of e-government systems. It was noted that within the case study various departments do not have access to other departments' data or information. Successful adoption of e-government and advanced readiness require a culture that promotes organisation collaboration. The culture of data sharing does not exist in many of Saudi Arabia government organisations. Thus it is indicated that new legislation is required to help with this concern to obtain the benefits of sharing data and information.

In terms of Business Processes Reengineering (BPR) the primary aims of using e-government systems is to improve the quality of services by using modern technology within government organisations. However, restructuring organisations is always associated with reengineering activities involved with their business processes. The introduction of e-government in Saudi Arabia shows the importance of this stage. The analysis of the fieldwork highlights that the reform of the work processes involves the way the organisation performs in its effort to reduce cost, increase productivity, and enhance service delivery to stakeholders. Reengineering process is crucial prior to and through the implementation of the e-government project.

6.2.3 Environmental Analysing Mechanism

The final results in this study are broadly similar to the findings of many other studies (Ahn, 2011; Bukhsh and Weigand, 2012). The analysis of the fieldwork highlights that cultural factors are highly factored in the change processes especially those involved within socio-technical systems like e-government. In Saudi Arabia, this was found to be even more crucial, due to the complexity of the culture. This is shown in the demography, education and language, awareness acceptance of a new technology, and trust elements in the survey.

In terms of the economy, the analysis of the fieldwork highlights that investment in the telecommunications sector is the main factor in the rapid development of the Saudi Arabian

economy. Moreover, investors not only bring technology to the market, but also competition and development of the ICT industry. The government issuing new policies and passing legislation that positively influenced technology adoption provided opportunities for the private sector and assisted in integrating the economy into the global market. The strong interaction between ICT and the economy confirm the significance of having a strong and sustainable economy.

In terms of political actions the analysis of the fieldwork highlights that such issues can lead to resistance, reduce trust, delay progress, or damage technology. This is more widely recognised in a developing country environment.

6.3 Research in Saudi Arabia

Several technological, organisational and environmental issues that affect stakeholders in their use and adoption of e-government systems influence the adoption of e-government in developing countries. Therefore, due to the limited data sets in the available literature relating to e-government adoption and readiness in Saudi Arabia, this research project is a significant contribution to the existing literature: The new analysis and findings from the data add to the previously limited research conducted in this area in Saudi Arabia.

6.4 EGISR Applications in Saudi Arabia

The adoption and readiness of e-government is a key challenge for developing countries especially in Saudi Arabia. Therefore, the framework has been developed to support the adoption and readiness of e-government in Saudi Arabia from different perspectives comprising four different layers.

An important aspect of this framework is to enable relevant stakeholders to establish the strategy and assess the progress in an appropriate way. Moreover, the experimental results also pointed out the vital association between the framework layers in terms of developing and assessing e-government successfully. The empirical framework for e-government adoption and readiness is a comprehensive processes and should be followed in parallel assessments.

6.5 Systematic Approach

It is important to state that a systematic approach is followed in this project, particularly in proposing the novel readiness assessment mechanism. This systematic approach enables the

proposed scheme to be applicable in all sections of an e-government formation. The structure of EGISR puts the technology layer as the major factor. The reason is the benefit of technology readiness in e-government, which engages different components including hardware, software, networks infrastructure, Internet penetration, software application, and current organisation and country (Saudi Arabia) to be adopted. Therefore, it is important to supply a range of types of technologies to assist the implementation of e-government in Saudi Arabia.

Next, in this proposed framework, is the organisational layer: A systematic approach to assess the overall organisational readiness aspect which includes: organisation structure, culture, size, strategy, vision interaction and planning issues i.e. leadership support, IS strategy, funding/budget, BPR, legislation, and data sharing and personnel challenges such as training and development and staff motivation. This layer proposes useful features to people who are responsible for developing e-government systems in public organisations, by providing them with a comprehensive assessment methodology.

Following, in the proposed framework, is the stakeholders' layer, which forms a primary focus of the research. It should be noted that stakeholders' readiness for the use of e-government and communication with government is also significant as the shift from the traditional way of delivering services progresses to online services.

Within the proposed framework environment readiness is the final layer of the scheme. It is a thorough assessment of the existing environment in which e-government will be implemented. It assesses the motivations and capacity of a country to commence and continue e-government programmes.

6.6 Comprehensive Architecture Guidelines

It is evident in the light of the reported literature that this area lacks a standard structure which can be followed to implement an e-government programme. In due course the proposed comprehensive architecture guidelines for e-government adoption and readiness will reduce confusion surrounding e-government assessment through understanding the implementation processes; classify requirements and provide the government in Saudi Arabia with a well-defined and easy-to-use framework and method for assessing the interoperability standards and specifications. The proposed architecture guideline is also a clear enhancement in respect to the existing approaches proposed so far and it is effortlessly replicable in

different contexts. However the proposed architecture guideline clearly shows further areas of improvement both from a research and practice perspective in Saudi Arabia.

6.7 Monitoring Tool

The biggest challenge within the current situation in Saudi Arabia was the effectiveness of monitoring tools. At the level of the overall implementation plan, the monitoring tool will focus on the resources committed and provide for the implementation of the e-government system. Thus, the assessment tool will evaluate the impact of the implementation of the plan, the outcomes and key indicators of progress set. At the project level, the monitoring tool will assess issues relating to deliverables.

6.8 Reduce Assessment Complexities

Based on the knowledge in this area, it is a known fact that existing schemes are too complex to understand or to apply in e-government systems. Moreover, it is a challenge to achieve an effective deployment of e-government structures. EGISR follows a simple structure thus, reducing complexities at different levels in the formation process of e-government adoption and readiness. In order to develop more integrated e-government services, government organisations must have a better understanding of their ability to support their outcomes. Current assessment tools and practices need to be updated to support these outcomes. This assessment tool has been identified as an effective measurement tool capable of reducing assessment complexities in one of the key areas of assessment that needs to be better developed in Saudi Arabia.

6.9 Decision Making

Decision makers should set up a clear plan to implement their strategy with a clear vision, specific objectives and a clear implementation plan otherwise the initial stage will prove a critical bottleneck, possibly for many years. In such a case as Saudi Arabia, a government should have the ability to perform assessments and follow-up actions during the implementation of the e-government project. For this purpose a new advanced assessment, building on its predecessor is proposed in this work. EGISR overcomes many of the limitations of existing frameworks, and more crucially paves the way for an effective impact on e-government initiatives, in relation to the decision making processes needed in the design and implementation of e-government systems in Saudi Arabia.

6.10 Summary

This chapter presents a discussion of the key analysis and findings of this research project. The study has illuminated crucial e-government issues for Saudi Arabia and thus developed an e-government adoption and readiness framework for Saudi Arabia, as well as for other developing countries. The presented discussion confirms the importance and application of the identified issues for the challenges in Saudi Arabia. However, the unique characteristics of Saudi Arabia revealed some issues to be more significant for its particular context. Further, the discussion conducted in this chapter specifies a number of issues which may help to improve the level of e-government adoption and readiness in Saudi Arabia and also provide direction for other developing countries. This chapter has also focused on explaining the key benefits of the developed framework implementation within Saudi Arabia.

Chapter Seven: Summary, Conclusions, and Recommendations

7.1 Introduction

This chapter aims to presents the main findings and conclusions derived from the review of the literature analysis and the empirical fieldwork research carried out. In addition, this chapter will present the research overview and process and provide a discussion of the contributions the thesis has made in the area of e-government assessment readiness. This will then be followed by a discussion of an outline of possible research limitations, and a review of recommendations for opportunities for further research directions in the area of e-government readiness.

7.2 Research Overview and Process

E-government is considered as a modern, growing, and important application area, delivered over the Internet. It has emerged in recent years, and is likely to have a positive impact on Citizens, Government, Business and Society alike. However, e-government is still relatively new in the field of information systems. More work is required in order to reach the primary goals of an inclusive intuitive interaction with government over the Internet. There is a gap between practice and theory identified by the absence of a comprehensive assessment framework for e-government systems and readiness in both the public and private sectors. From analysing the current research in the field of e-government, it can be observed that there are limitations in the use of e-government services, and there are many issues facing e-government adoption and implementation. One of the main issues is the readiness for e-government and following the review of the literature it can be observed that there are no comprehensive assessment methods to assess e-government readiness. E-government presents a tremendous opportunity to move forward, providing advanced and cost-effective government services as well as creating a better relationship between citizens and government. Likewise, these new technological developments and this trend appear likely to continue at a great pace in the future. Furthermore, IT innovation provides significant opportunity for governments to improve the delivery of information and services.

Bearing this in mind, the transition of e-government systems is not an easy mission; many technical and non-technical issues must be faced and addressed in the adoption of such new ideas. Moreover, the literature review, in this work, indicated that there is a gap between

practice and theory identified by the absence of a comprehensive assessment framework for e-government systems and readiness in both the public and private sectors.

To this end, the principal aim of this research, as illustrated in chapter one, is to develop a comprehensive assessment framework of associated guidelines and tools to assess and support E-government Information Systems Readiness (EGISR). Moreover, the proposed framework aims to provide a modelling and analysis method to guide the assessment of e-government information systems (EGIS) readiness including assessing the degree of maturity of e-government systems.

7.3 Summary of Research Findings

The key findings of this research are based on the case study reported and the empirical data analysed. Since the main contribution of this research project is the development of a novel readiness assessment framework. The findings are summarised as follows.

Finding 1: The review of the literature in the area of e-government systems revealed an absence of a well-defined framework for assessing e-government system readiness and a lack of appropriate guidelines to help government authorities to migrate to the latest technologies. Furthermore this area has not been expansively studied or analysed. Therefore, there are no comprehensive assessment methods to assess e-government readiness. Moreover, there is a gap in the existed field regarding the adoption of a comprehensive assessment framework in the developing countries in general and in Saudi Arabia in particular: There is an urgent need to develop a comprehensive readiness assessment method as well as guidelines to be used in both developed and developing countries.

Finding 2: A comprehensive framework has been developed to fill the gap in the literature review regarding e-government readiness. This framework was built to fit the context of developing countries in general and Saudi Arabia in particular.

The developed framework provides a modelling and analysis method to guide the assessment of e-government readiness including assessing the degree of maturity of e-government systems. The developed framework contains the internal as well as external factors affecting e-government readiness, which was categorised into four main layers: (I) technology readiness, (II) organisation readiness, (III) people/stakeholders readiness, and (IV) environment readiness, based on the significant factors identified in the field work.

Finding 3: All integrated layers of this framework have been empirically tested and validated using the Kingdom of Saudi Arabia as a case study. Moreover, during the fieldwork, it has been found that the assessment framework was an appropriate tool to assess e-government readiness that can be used as an evaluation methodology, determining the degree of progress made by government organisations towards e-government implementation.

Finding 4: The findings from the survey show that hardware, software, network communications, information systems, and security infrastructure at organisation level had a statistically significant impact ($P=\leq 0.05$), on the organisational readiness for successful adoption and use of e-government in the public sectors. Additionally, information systems infrastructure is also an important factor, affecting the readiness of using e-government services according to workers in the public organisation, with a mean importance factor of 4.04 out of 5 and a standard deviation of 0.474.

Finding 5: The finding from the survey show that top management support, strategy and planning, human resources development, and awareness and motivation at the organisation level was statistically significant ($P=\leq 0.05$) for the successful adoption and use of e-government in the public sectors. On the other hand, Human Resources Development as described above is considered as important aspect effect the readiness of using e-government services within the public organisation.

Findings 6: Findings from the government officials' interviews show that there was an agreement between them on the importance of having an acceptable level of readiness within the Saudi community in order to achieve a successful e-government programme. Managers agreed to the significance of all the suggested readiness elements on increasing usage of e-government services.

Finding 7: Findings from the government officials' interviews show that e-government officials in Saudi Arabia are working hard, and there is an effort to develop e-government systems in Saudi Arabia at all levels.

7.4 Meeting the Aim, Objectives and Questions of this Research

To achieve the aim and objectives of this research, four research questions were defined and how they were addressed in the thesis is summarised below:

Research Question 1: What are the technical, organisational and environmental factors that influence the readiness and the process of e-government systems in real time environment?

Based on the review of the literature, a number of e-government readiness challenges were identified and analysed and investigated the empirical data collected from the fieldwork in Saudi Arabia. It was done at the citizens' level, staff and at government officials' perspectives. In order to identify the factors that influences the readiness and the process of e-government systems in a real time environment.

Research Question 2: What are the main requirements for assessing e-government readiness?

Based on the review of the literature, a number of requirements for assessing e-government readiness were identified and analysed. Using the framework developed in this research project, will increase the effectiveness of using e-government as well as assessing e-government and identify the factors that delay or hinder to reach a full benefits of e-government as well as the access of e-services.

Research Question 3: How can a full benefit be gained from new technology to support e-government systems and be further harnessed to build an effective environment to deliver better services?

Based on the review of the literature, there were a number of benefits in the adoption of new technology. This new technology will support e-government systems in building an effective environment to deliver better services. These benefits were identified and analysed. The proposed framework aims to provide a modelling and analysis method to guide the assessment of EGISR readiness including assessing the degree of maturity of e-government systems.

7.5 Contribution to Knowledge and Research Novelty

The outcomes of this research, as well as the findings highlighted in the previous section, have made and confirmed the novel contribution to the theoretical and practical perspectives of knowledge in the field of e-government assessment.

This research is contributing to the body of theoretical knowledge investigating the crucial factors that influence e-government readiness and adoption. This process has not been previously well examined in Saudi Arabia; therefore the findings represent a novel contribution in the field of e-government in Saudi Arabia. The classification aspect, in this research project, regarding e-government readiness and adoption in Saudi Arabia will enhance the knowledge of essential elements to support the process of change as well as

contributing to understanding the challenges of e-government readiness and adoption. Moreover, this research project also explained how a full benefit can be gained from new technology to support E-government System and be further harnessed to build an effective environment to deliver better services.

A comprehensive assessment framework has been developed to assess e-government systems readiness, which provides comprehensive guidelines and tools. This aids government officials during the implementation process and assesses the state of e-government systems readiness. The framework improves understanding of the process of assessment of e-government readiness by identifying the paths, which can be followed by any government organisations seeking to adopt e-government initiatives. The finalised framework provides a comprehensive structure for e-government readiness assessment as well as allowing decision makers, in government, to set a vision and strategic action plan for the future of e-government by identifying key elements and stages.

Moreover, the finalised framework aims to reduce the complexities of the assessment process, by identifying the main requirements of ICT tools, organisation, and highlighting the importance of the stakeholders-people readiness as well as the impact of environmental readiness.

7.6 Research Limitations

The proposed framework represents the start of research into e-government readiness, as well as the first step towards establishing and changing the traditional methods of delivering government services by using the latest technologies. However, this research was conducted with only one case study and was limited to one geographical area, and hence it is hard to decide whether the proposed framework is applicable in other e-government implementations: It is difficult to generalise from these results to other regions of the world.

Another limitation of this research was the time and resource constrains. This research had to be completed within a reasonable timeframe allocated for PhD research. If more time were allocated for the empirical work, the level of detail obtained, particularly from the case study, would have been greater and of a wider scope.

With respect to the interviews analyses it was hard to include all the findings from the interviews in this thesis. Therefore, effort was concentrated on the most relevant and significant data that can achieve the research aim and objectives and answer the research

questions sufficiently. However, the rest of the findings will be used and appear in future works.

Finally, the research deals with government data access, which is restricted by government and subject to privacy laws. In some instances the required information could not be accessed due to confidentiality.

7.7 Recommendations for Further Research

E-government is a comparatively new phenomenon and there are many issues still requiring study. Therefore, this research serves as a starting point for larger and further research into the areas of E-government Information System Readiness (EGISR). Thus, in light of the limitations of this research and other concerns arising in this research and in the review of the literature, some opportunities and interest areas were discovered and are worth future study. These are as follows:

- The development of a framework for assessing e-government readiness was based on Saudi Arabia as a case study. It is recommended that further validation of this framework in different contexts needs to be performed by conducting a similar research on different countries that might share basic characteristics with Saudi Arabia such as GCC countries. The outcomes and findings might be compared to the results of this research to extend the generalizability and contribution of this framework.

- An explanatory further study to offer a framework for information systems infrastructure assessment to complement the information system development and implementation functions is required. This will allow government organisations to know how to evaluate their information systems infrastructure connected with e-government and exchange data.

- Security Infrastructure for e-government to protect data exchange and the website contents is one of the most important and significant elements for reaching a progressive stage of e-government. It is recommended that a further study, to assess the security readiness, in the government organisations as well as to increase the awareness of citizens and staff, be conducted. Users need to be assured of their data

privacy as well as the safety and security of electronic transactions. Without such assurance e-government may not thrive in a highly competitive and dynamic environment.

- Finally, in the future, there is a need to work on a mathematical representation of the assessment framework for e-government, which will assist in defining the best combination of all sub layers in order to come up with the highest assessment framework for any government around the world hoping to launch e-services for its citizens.

We believe that the proposed and developed framework is fully capable of providing an efficient and reliable readiness assessment for e-government services particularly in the Kingdom of Saudi Arabia.

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Appendices

Appendix A: Arabic Version

Appendix A1: Survey Questionnaire for Citizens

الحكومة الإليكترونيّة فى المملكة العربية السعودية

أنا طالب في مرحلة الدكتوراه في كلية علوم الحاسب الآلي والعلوم الرياضية ، بجامعة جون مورس في ليفربول ، المملكة المتحدة. كجزء من أطروحتي لنيل شهادة الدكتوراه فإنني أقوم حالياً بإجراء تقييم حول مدى الاستعداد والنضج لتقديم خدمات الحكومة الإلكترونية في المملكة العربية السعودية من وجهة نظر المواطنين في المملكه العربية السعودية .

و سوف تبين هذه الدراسة بعد تحليل بياناتها عن طبيعة العوامل التي تواجه الحكومة الإلكترونية بشكلها الحالي و إيجاد الحلول المناسبة لها للنهوض بمستوى الخدمات الحكومية عبر الانترنت في المملكة العربية السعودية لتفي بالغرض المطلوب منها كما سوف تساعدنا في وضع إطار عمل شامل لتقييم استعداد و جاهزية نظام الحكومة الإليكترونيّة فى المملكة العربية السعودية.

مرفقاً مع هذا الخطاب استمارة استبيان تحتوي على مجموعة من الأسئلة أرجو منكم الإجابة عليها بمصداقية باستكمال الأسئلة بالتأشير على الإجابات التي ترونها مناسبة من وجهة نظركم . .إن هذا الاستبيان يستغرق منكم ما بين 10 – 15 دقيقه لإكماله إن شاء الله. علماً بأن لك الحرية التامة في ترك الاستبيان عند أي سؤال و تسلمه دون أي إحراج أو مساءلة. كما لا يتطلب الأمر منكم كتابة الإسم فى الإستبيان.

عزيزي المشارك / المشاركة إن المعلومات التي ستزودننا بها وردودكم سيتم التعامل معها بسرية تامة وسوف تستخدم فقط لأغراض البحث، و لن يطلع عليها إلا الباحث الرئيسي و المشرفيين على هذا البحث. وفي حالة وجود أي استفسار أو الحصول على نسخة مختصرة عن نتائج هذا المشروع يرجي الاتصال بي أو على البرفوسور (A. Taleb-Bendiab) رئيس قسم البحوث في كلية علوم الحاسب الآلي والعلوم الرياضية ، جامعة جون مورس في ليفربول و المشرف المباشر على هذا المشروع.

و أخيراً إنني احترم و اقدر الأعباء والالتزامات الكثيرة المفروضة على وقتكم و لكن أرجو شاكراً أن تعطوني وقتا لأستكمل هذا الاستفتاء ، و أي مساعدة تقدم لي سوف تكون موضع التقدير و الاحترام . وشكرا مرة أخرى علي تعاونكم معي في هذا الأمر المهم بالنسبة لي و لكم .

مع فائق الشكر و عظيم الإحترام ،،،،،،،،،،،،

الباحث

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الجزء الأول: البيانات الشخصية

1- العمر:

أقل من 20	☐	24 - 20	☐
29 – 25	☐	34 -30	☐
39 – 35	☐	44 - 40	☐
49 – 45	☐	54 - 50	☐
59 -55	☐	أكبر من 60	☐

2- الجنس:

ذكر	☐	أنثى	☐

3- الجنسية:

سعودي	☐	غير سعودي	☐

4- الحالة الأجتماعية:

متزوج	☐	أعزب	☐

5- المستوي التعليمي:

الشهادة المتوسطة	☐	الثانوية العامة	☐
شهادة جامعية	☐	شهادة الماجستير	☐
شهادة الدكتوراه	☐		

أخري: .....

6- الدخل الشهري:

أقل من 2,999	☐	5,999 – 3,000	☐
8,999 – 6,000	☐	11,999 – 9,000	☐
14,999 - 12,000	☐	19,999 -15,000	☐
أكثر من 20,000	☐		

القسم الثاني : القضايا المتعلقة بالخبرة في استخدام الكمبيوتر والإنترنت

7- هل سبق لك اتستخدام الكمبيوتر؟					
			نعم	☐	لا ☐
8- أين تستخدم الكمبيوتر عادة؟					
			البيت	☐	العمل ☐
			مقهي الإنترنت	☐	
أماكن أخرى اذكرها:					
9- كم عدد الساعات التى تستخدام فيها الكمبيوتر في اليوم؟					
			أقل من ساعة	☐	1 – 5 ساعات ☐
			6 – 10 ساعات	☐	أكثر من 10 ساعات ☐
10-ما هو الغرض الرئيسي من استخدام الكمبيوتر؟					
			تطبيقات الإنترنت	☐	التطبيقات المكتبية ☐
			الألعاب والترفيه	☐	☐
11- هل تستخدم الانترنت؟					
			نعم	☐	لا ☐
12 - كم عدد الساعات التى تستخدام فيها الانترنت في اليوم؟					
			أقل من ساعة	☐	1 – 5 ساعات ☐
			6 – 10 ساعات	☐	أكثر من 10 ساعات ☐
13 - ما هو الغرض الرئيسي من استخدام الإنترنت؟					
			الاتصالات (البريد الإلكتروني / دردشة)	☐	عمل ☐
			تعليم / البحث عن المعلومات	☐	التسوق ☐
أخرى اذكرها:.....					
14- ماهو نوع خدمة الاتصال بالإنترنت التي تستخدمها؟					
			إتصال مباشر	☐	التلفون الخليوي اوالنقال ☐
			خدمة النطاق العريض / DSL	☐	لا يوجد ☐
أخرى اذكرها:					
15- كيف تقيم خدمة الاتصال بالإنترنت؟					
			سريع جدا	☐	سريع ☐
			معقول	☐	ضعيف ☐
16- كيف تقيم أسعار الاتصال الإنترنت؟					
			غالية جدا	☐	غالية ☐
			رخيصة	☐	
17 - وعموما ، كيف تقيم المهارات الخاصة بك في إتستخدم الإنترنت و الكمبيوتر؟					
			مستخدم خبير	☐	مستخدم متقدم ☐
			مستخدم مبتدئ	☐	مستخدم جديد ☐

القسم الثالث : القضايا المتعلقة بالحكومة الإلكترونية

18- هل أنت على علم بأي من خدمات الحكومة الإلكترونية في المملكة؟

نعم ☐ لا ☐

إذا كانت الإجابة (نعم) كيف : .....
.....

19- هل أنت مستعد لاستخدامها؟

نعم ☐ لا ☐

إذا كانت الإجابة (لا) لماذا : .....
.....

20- ما رأيك حول توفر خدمات الحكومة الإلكترونية حالياً؟

جميع الخدمات متاحة ☐ بعض الخدمات متاحة ☐

مطلوب المزيد من الخدمات ☐

أخرى اذكرها: .....
.....

21- هل سبق لك استخدام مواقع الحكومة الإلكترونية (بوابات)؟

نعم ☐ لا ☐

a21- إذا كانت الإجابة (لا) لماذا: .....
.....

b21- إذا كانت الإجابة (نعم) يرجى الإجابة على الأسئلة التالية:

	العبارة	راضٍ تماماً 5	راضٍ 4	راضٍ إلى حد ما 3	غير راضٍ 2	غير راضٍ تماماً 1
1	يوفر الموقع المعلومات والنماذج اللازمة ليتم تحميلها.	☐	☐	☐	☐	☐
2	يوفر الموقع تعليمات مفيدة لأداء مهمتي.	☐	☐	☐	☐	☐
3	يتميز الموقع بسرعة تحميل جميع النصوص والرسومات البيانية.	☐	☐	☐	☐	☐
4	يوفر الموقع معلومات محدده وفقا لاحتياجاتي.	☐	☐	☐	☐	☐

5	المعلومات الموجودة على الموقع محدثة.	☐	☐	☐	☐	☐
6	يوفر الموقع المعلومات التي تحتاجها في الوقت المناسب.	☐	☐	☐	☐	☐
7	المعلومات الواردة في الموقع متعلق بالموضوع المطلوب.	☐	☐	☐	☐	☐
8	الموقع منظم بشكل جيد.	☐	☐	☐	☐	☐
9	الموقع متاح في جميع الأوقات.	☐	☐	☐	☐	☐
10	مواقع الحكومة الإلكترونية آمنة.	☐	☐	☐	☐	☐
11	مواقع الحكومة الإلكترونية يمكن الوثوق بها.	☐	☐	☐	☐	☐
12	عملية التفاعل مع موقع الحكومة الإلكترونية واضحة ومفهومة.	☐	☐	☐	☐	☐
13	موقع الحكومة الإلكترونية على شبكة الإنترنت مرنة و يمكن التفاعل معها.	☐	☐	☐	☐	☐
14	تعزز موقع الحكومة الإلكترونية الفعالية في البحث واستخدام هذه الخدمة.	☐	☐	☐	☐	☐
15	موقع الحكومة الإلكترونية على شبكة الإنترنت وفرت خدمة ثمينة بالنسبة لك.	☐	☐	☐	☐	☐

22-يرجى تقديم تعليقك حول الخدمات الحالية للحكومة الإلكترونية في المملكة العربية السعودية :

	العبارة	**راضً تماماً**	**راضً**	**راضً إلى حد ما**	**غير راضً**	**غير راضً تماماً**
		5	**4**	**3**	**2**	**1**
1	الحاجة لبرامج تدريبية في مجال تكنولوجيا المعلومات و خدمات الحكومة الإلكترونية.	☐	☐	☐	☐	☐
2	عدم وجود عدد كاف من أجهزة الكمبيوتر في المؤسسات للاستخدام العام.	☐	☐	☐	☐	☐
3	انعدام الثقة في الأمن والخصوصية في أنظمة الحكومة الإلكترونية الحالية.	☐	☐	☐	☐	☐
4	عدم توافر التوقيع الالكتروني.	☐	☐	☐	☐	☐
5	عدم وجود موظفين مؤهلين في المؤسسة لدعم خدمات الحكومة الإلكترونية.	☐	☐	☐	☐	☐
6	عدم وجود موظفين مؤهلين في المؤسسة فيما يتعلق بقضايا الأمن.	☐	☐	☐	☐	☐

7	ارتفاع تكلفة الانترنت والكمبيوتر.	☐	☐	☐	☐	☐
8	انعدام الوعي والدوافع حول خدمات الحكومة الإلكترونية.	☐	☐	☐	☐	☐
9	بطّ الوصول إلى نظام الحكومة الإلكترونية وتحميله.	☐	☐	☐	☐	☐
10	بطّ تعاملات الحكومية الإلكترونية .	☐	☐	☐	☐	☐
11	المشاكل التقنية ، مثل العطل فى الشبكة و الكمبيوتر المركزي سوف تؤثر على انتباهكم إلى استخدام خدمات الحكومة الإلكترونية.	☐	☐	☐	☐	☐
12	التفاعل مع نظام الحكومة الإلكترونية ، من شأنه أن يكون واضحا اذا كانت القيادة ملتزمة بمشروع الحكومة الالكترونية.	☐	☐	☐	☐	☐

23 – إذا كان لديك الهاتف الخلوي هل تفضل استخدامه للاتصال بخدمات الحكومة الإلكترونية ؟

نعم ☐ لا ☐

إذا كانت الإجابة (لا) لماذا : .....
.....

24 – هل سبق لك أن سمعت عن الحوسبة السحابية من قبل؟

نعم ☐ لا ☐

إذا كانت الإجابة (نعم) يرجى تقديم تعليقك حول سحابة الحوسبة:

.....
.....
.....
.....
.....

25 – عموما ، هل أنت راض عن نظام الحكومة الإلكترونية والخدمات في المملكة العربية السعودية ؟

نعم ☐ لا ☐

إذا كانت الإجابة (لا) لماذا :

.....
.....

إذا كان لديك أي اقتراحات تسهم في تطوير خدمات الحكومة الإلكترونية يرجي تقديم قائمة بها أدناه.

1-.....

2-.....

3-.....

4-.....

شكراً لتعاونكم

Appendix A2: Survey Questionnaire for Staff

الحكومة الإليكترونيّة فى المملكة العربية السعودية

أنا طالب في مرحلة الدكتوراه في كلية علوم الحاسب الآلي والعلوم الرياضية ، بجامعة جون مورس في ليفربول ، المملكة المتحدة. كجزء من أطروحتي لنيل شهادة الدكتوراه فإنني أقوم حالياً بإجراء تقييم حول مدى الاستعداد والنضج لتقديم خدمات الحكومة الإلكترونية في المملكة العربية السعودية من وجهة نظر المواظفين في المملكه العربية السعودية .

و سوف تبين هذه الدراسة بعد تحليل بياناتها عن طبيعة العوامل التي تواجه الحكومة الإلكترونية بشكلها الحالي و إيجاد الحلول المناسبة لها للنهوض بمستوى الخدمات الحكومية عبر الانترنت في المملكة العربية السعودية لتفي بالغرض المطلوب منها كما سوف تساعدنا في وضع إطار عمل شامل لتقييم استعداد و جاهزية نظام الحكومة الإليكترونيّة فى المملكة العربية السعودية.

مرفقاً مع هذا الخطاب استمارة استبيان تحتوي على مجموعة من الأسئلة أرجو منكم الإجابة عليها بمصداقية باستكمال الأسئلة بالتأشير على الإجابات التي ترونها مناسبة من وجهة نظركم . .إن هذا الاستبيان يستغرق منكم ما بين 20 – 25 دقيقه لإكماله إن شاء الله. علماً بأن لك الحرية التامة في ترك الاستبيان عند أي سؤال و تسلمه دون أي إحراج أو مساءلة. كما لا يتطلب الأمر منكم كتابة الإسم فى الإستبيان.

عزيزي المشارك / المشاركة إن المعلومات التي ستزودننا بها وردودكم سيتم التعامل معها بسرية تامة وسوف تستخدم فقط لأغراض البحث، و لن يطلع عليها إلا الباحث الرئيسي و المشرفيين على هذا البحث. وفي حالة وجود أي استفسار أو الحصول على نسخة مختصرة عن نتائج هذا المشروع يرجي الاتصال بي أو على البرفوسور (A. Taleb-Bendiab) رئيس قسم البحوث في كلية علوم الحاسب الآلي والعلوم الرياضية ، جامعة جون مورس في ليفربول و المشرف المباشر على هذا المشروع.

و أخيراً إنني احترم و اقدر الأعباء والالتزامات الكثيرة المفروضة على وقتكم و لكن أرجو شاكراً أن تعطوني وقتا لأستكمل هذا الاستفتاء ، و أي مساعدة تقدم لي سوف تكون موضع التقدير و الاحترام . وشكرا مرة أخرى علي تعاونكم معي في هذا الأمر المهم بالنسبة لي و لكم .

مع فائق الشكر و عظيم الإحترام ،،،،،،،،،،،،

الباحث

ربيع بن فؤاد كردي

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القسم الأول: معلومات أساسية

1- المنصب الحالي: .....

2- القسم: .....

3- الجنسية:

سعودي	☐	غير سعودي	☐

4- المستوي التعليمي:

الشهادة المتوسطة	☐	الثانوية العامة	☐
شهادة جامعية	☐	شهادة الماجستير	☐
شهادة الدكتوراه	☐		

أخري: .....

5- سنوات الخدمة في مؤسستك :

أقل من 1	☐	5-1	☐
10-6	☐	15-11	☐
20-16	☐	أكثر من 20	☐

6- عدد الدورات التدريبية

3-1	☐	10-7	☐
6-4	☐	أكثر من 11	☐
لا يوجد	☐		

القسم الثاني: القضايا المتعلقة بالحكومة الإلكترونية و تكنولوجيا المعلومات

(البنية التحتية لتكنولوجيا المعلومات والاتصالات ، البنية التحتية للشبكة والأمن، البنية التحتية لنظام المعلومات)

7- هل أنت على علم بأي من أنظمة الحكومة إليكترونيّة داخل المؤسسة ؟

نعم ☐ لا ☐

إذا كانت الإجابة (نعم) كيف : .....

.....

.....

.....

.....

8- هل تمتلك مؤسستكم برامج حديثة ؟

نعم ☐ لا ☐

a8- إذا كانت الإجابة (نعم) كيف:.....

.....

.....

.....

.....

b8- إذا كانت الإجابة (لا) لماذا:.....

.....

.....

.....

.....

9- هل تمتلك مؤسستكم أجهزة حديثة ؟

نعم ☐ لا ☐

a9- إذا كانت الإجابة (نعم) كيف : .....

.....

.....

.....

.....

b9- إذا كانت الإجابة (لا) لماذا: .....

.....

.....

.....

.....

10- هل تمتلك مؤسستكم شبكة من الكومبيوترات مزوادة بالبرامج الحديثة ؟

I. لا يوجد شبكة . ☐

II. عدد قليل من الكومبيوترات تستخدام فى معالجة النصوص . ☐

III. عدد قليل من الكومبيوترات موصّلة بشبكة تستخدم فقط للبريد الإلكترونيّ و ربّما بعض البرامج ألإدرية . ☐

IV. شبكة كومبيوترات موصّلة كلياً مرتبطة بالكمبيوتر المركزيّ في مركز البيانات فى المؤسسة . ☐

V. شبكة كومبيوترات موصّلة كلياً مرتبطة مع الكمبيوتر المركزيّ في مركز البيانات فى الدّولة . ☐

أخرى اذكرها : .....

.....
.....
.....
.....

11 - هل تمتلك مؤسستكم شبكة إنترنت كجزء من البنية التحتية لتكنولوجيا المعلومات و الاتصالات ؟

نعم ☐ لا ☐

a11- إذا كانت الإجابة (لا) لماذا : .....

.....

.....

.....

b11- إذا (نعم) ما مدى أهمية النقاط التالية لمؤسستك ؟

	العبارة	راضً تماماً	راضً	راضً ألى حد ما	غير راضً	غير راضً تماماً
		5	4	3	2	1
I	تحسين الاتّصال و التّنسيق بين الموظّفين داخل المنظّمة .	☐	☐	☐	☐	☐
II	تحسّين جودة عمليّة صنع القرار في إدارة المنظّمة .	☐	☐	☐	☐	☐
III	تسهيل الوصول للبيانات الحكوميّة و تبادل المعارف على كل المستويات داخل المؤسسة	☐	☐	☐	☐	☐
IV	خفض التّكاليف و الوقت المستهلك في تطوير المحتوي و الازدواجية و تحسين الخدمة.	☐	☐	☐	☐	☐

12- كيف ستصف حالة الوصول إلى الإنترنت في مؤسستكم ؟

I. بعض المواظفين لديهم اتّصال بالإنترنت داخل المؤسسة. ☐

II. المؤسسة لديها اتّصال بالإنترنت من خلال الشّبكة أو الأنظمة الإداريّة المستقلّة. ☐

III. الإتّصال بالإنترنت في المؤسسة من خلال المشاركة في منظومة مستقلةّ بذاتها. ☐

IV. يمكن للمواظفين التواصل بالعمل عن طريق كمبيوتراتهم الشخصية في منازلهم. ☐

أخرى اذكرها :

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13- ما نوع الإنترنت المستخدم لديك في منظّمتك ؟

I. اتّصال هاتفيّ للمودم - مخصّص للبريد الإلكترونيّ و الإنترنت . ☐

II. اتّصال هاتفيّ للمودم – مع عدة وظائف أخرى، على سبيل المثال، الفاكس، التّليفون . ☐

III. مودم مستقل ☐

IV. ليس لدى المؤسسة أيّ اتّصال بالإنترنت ☐

أخرى اذكرها :

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14- كيف تصف الأنظمة الأمنية للبنية التحتية لتكنولوجيا المعلومات والاتصالات في مؤسستكم ؟

I. أنظمة أمنية محلّ ثّقة لحماية البنية التحتية لتكنولوجيا المعلومات والاتصالات و موقع الحكومة الإلكترونية ☐

II. أنظمة أمنية موثوق بها إلى حد ما موثوقة لحماية البنية التحتية لتكنولوجيا المعلومات والاتصالات ولكنها بحاجة الى مزيد من التعديلات مع تكنولوجيا جديدة لحماية موقع المؤسسة ☐

III. الأنظمة الأمنيّة تعاني من العديد من الثغرات الأمنية في البنية التحتية لتكنولوجيا المعلومات والاتصالات ، وتفتقر إلى الحماية اللازمة لمحتويات موقع المؤسسة على شبكة الإنترنت ☐

أخرى اذكرها :

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15- يرجى وصف التقنيات و التّكنولوجيات الأمنيّة التي طبقت فى مؤسستكم لحماية البنية التحتية وتكنولوجيا المعلومات والاتصالات و محتويات الموقع؟

I. البنية التحتية للمفتاح العام (PKI) ☐

II. نظم القياسات الحيوية (Biometrics systems) ☐

III. أنظمة كشف التّطفّل أوالتسلل (Intrusion Detection systems) ☐

IV. البطاقات الذكية (Smart Cards) ☐

V. الشهادة الرقمية (Digital Certificate) ☐

VI. الحوائط (الجدران) النّاريّة (Firewalls) ☐

أخرى اذكرها :

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16- ما هي المشاكل الرئيسية للبنية التحتية لتكنولوجيا المعلومات والاتصالات في مؤسستكم و التي سوف تؤثر سلبيًّا على نظام الحكومة الإليكترونيّة ؟

I. مشاكل التكامل (على سبيل المثال دمج البيانات الموجودة في قواعد بيانات متعددة في جميع أنحاء المؤسسة ، وربط التطبيقات والعمليات الجارية داخل المؤسسة وبين الإدارات) ☐

II. الشبكات و البنية التحتية لتكنولوجيا المعلومات والاتصالات فى المؤسسة غير جديرة بالثّقة و لا يمكن الاعتماد عليها . ☐

III. التكنولوجيا و التطبيقات اللازمة لتنفيذ الحكومة الإلكترونية ليست متوافقة مع الأنظمة و التطبيقات الحاليّة الموجودة في المؤسسة بسبب تعقيدها ☐

أخرى اذكرها :

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17- كيف تصف التقدّم في البنية التحتية لتكنولوجيا المعلومت و الاتصالات في مؤسستكم ؟

I. البنية التحتية لتكنولوجيا المعلومت و الاتصالات متقدمة جداً ☐

II. البنية التحتية لتكنولوجيا المعلومت و الاتصالات إلى حد ما متقدمة ☐

III. بطء القدم في البنية التحتية لتكنولوجيا المعلومت و الاتصالات بسبب نقص الموارد المالية ☐

أخرى اذكرها :

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18- كم مرّة يتم تجمع الملاحظاتٍ من المواطنين و الشركات فيما يتعلق بخدمات الحكومة الإليكترونيّة الّتي تقدمها مؤسستكم ؟

شّهريّاً ☐ ربع سنوي/ فصلياً ☐

سنويًّا ☐ عند الحاجة ☐

19- هل تستخدم مؤسستكم الملاحظات لعمل الإجراءات التّقويميّة لتحسين نظام الحكومة الإليكترونيّة و الخدمات المقدمة ؟

نعم ☐ لا ☐

a19- إذا كانت الإجابة (نعم) كيف :

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b19- إذا كانت الإجابة (لا) لماذا:

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20- من فضلك يرجي تقديم تعليقاتك حول البنية التحتية و مستوى نضج نظام الخدمات الإكترونية في مؤسستكم لإجراء المعاملات على الانترنت ؟

	العبارة	راضً تماماً	راضً	راضً ألى حد ما	غير راضً	غير راضً تماماً
		5	4	3	2	1
A20	المعلومات على موقع المؤسسة خالية من الأخطاء .	☐	☐	☐	☐	☐
B20	المعلومات على موقع المؤسسة حديثة .	☐	☐	☐	☐	☐
C20	المعلومات التي على موقع الحكومة الإكترونية الخاص بالمؤسسة وثيقة الصّلة بالموقع .	☐	☐	☐	☐	☐
D20	المعلومات على موقع المؤسسة سهلة أن تقرأ و تفهم .	☐	☐	☐	☐	☐
E20	يعمل موقع المؤسسة دائمًا بطريقة صحيحة .	☐	☐	☐	☐	☐
F20	يوفّر موقع المؤسسة النمادج و المعلومات الضرورية للتحميل .	☐	☐	☐	☐	☐
G20	يوفر موقع المؤسسة الإستمارات الضرورية لتعبيئتها و إرسالها عن طريق الإنترنت	☐	☐	☐	☐	☐
H20	يوفّر موقع المؤسسة الإرشادات المفيدة و الهامة .	☐	☐	☐	☐	☐
I20	موقع المؤسسة آمن .	☐	☐	☐	☐	☐
J20	موقع المؤسسة سهل الاستخدام بالنسبة لذوي الاحتياجات الخاصة.	☐	☐	☐	☐	☐

القسم الثالث: القضايا المتعلقة بالحكومة الإلكترونية و المؤسسة

21- هل سبق أن تدربت على إستخدام نظام الحكومة الإليكترونيّة ؟

نعم ☐ لا ☐

إذا كانت الإجابة (لا) لماذا :

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22-ماذا نوع التّدريب ؟

تدريب للمبتدئين / تمهيدي ☐ تدريب خاص بالحكومة الإليكترونيّة ☐

متوسط ☐

أخرى اذكرها :

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23-أين تقام الدورات التدريبية للموظفين في مؤسستكم ؟

معاهد التّدريب الخاصّه ☐ مرافق التّدريب الموصي بها من الدولة ☐

تدريب داخل القسم ☐ قسم تكنولوجيا المعلومات في المؤسسة ☐

أخرى اذكرها :

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24-كيف تجري دورات تكنولوجيا المعلومات و الاتصالات مؤسستكم ؟

شّهريّاً	☐	ربع سنوي / فصلياً	☐
سنويًّا	☐	عند الحاجة	☐

أخرى اذكرها :

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25-هل يمكن أن تصف من فضلك استراتيجيّة التدريب الخاصة بتكنولوجيا المعلومت و الاتصالات الّتي تستخدم في مؤسستك ؟

I. توجد رؤية واضحة لأهمّيّة التّدريب و الإدارة العليا تساند هذه الرّؤية و تفهم الحاجة لهذه الدّورات التّدريبيّة بالنسبة لموظّفي المؤسسة . ☐

II. خطّة التدريب للمؤسسة موضوعة لكنّ لم تنفذ بسببإهمال الإدارة العليا وعدم تقديم الدّعم للموظّفين . ☐

III. لا يوجد خطّة استراتجية للتدريب فى المؤسسة . ☐

أخرى اذكرها :

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26-هل مؤسستكم لديها رؤية واضحة و إدرك لأهمية تّبنّي نظام الحكومة إليكترونيّة ؟

نعم ☐ لا ☐

a26- إذا كانت الإجابة (نعم) كيف :

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b26- إذا كانت الإجابة (لا) لماذا :

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27-هل وضعت مؤسستكم خطة استراتيجيّة لإعتماد نظام الحكومة إليكترونيّة ؟

نعم ☐ لا ☐

a27- إذا كانت الإجابة (نعم) كيف :

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b27- إذا كانت الإجابة (لا) لماذا:

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28-ما هو الإجراءات الإستراتيجية المستقبليةّ لتنفيذ نظام حكومة إليكترونيّة في مؤسستكم؟

I. توسيع البنية التّحتيّة الحاليّة لتكنولوجيا المعلومت و الاتصالات في المؤسسة . ☐

II. تقوية الأنظمة الأمنيّة لموقع الحكومة الإليكترونيّة بتوفيرأنظمة حماية حديثة لتقديم المعاملات بصورة آمنة و مضمونة . ☐

III. إدخال الخصائص و الوسائل المتقدّمة لتكنولوجيا المعلومات و الاتصالات في موقع الحكومة الإليكترونيّة وغيرها من الخدمات الاخري. ☐

IV. إنشاء منطقة تفاعل بين المواطنين و المسئولين من خلال أنظمة البريد الإلكترونيّ أو المنتديات على الشّبكة. ☐

V. التركّيز على قضيّة التّكامل من خلال ربط البيانات، العمليات، التطبيقات بين المؤسسات الحكومية . ☐

أخرى اذكرها : .....

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29-ما هو مستوى الدّعم في مؤسستكم نحو تبنّي نظام الحكومة الإليكترونيّة ؟

I. هناك التزام و دعم من الإدارة العليا الّتي تدفع نحو تبنّي الحكومة الإليكترونيّة وهي قادرة على توفيّر الاعتمادات الضّروريّة . ☐

II. هناك دّعم و التزام إلى حد ما من الإدارة العليا لتبنّي الحكومة الإليكترونيّة و لكن غير كاف ☐

III. الإدارة العليا غالباً لا تعير اهتماماً لعمليّة تّبنّي الحكومة إليكترونيّة . ☐

IV. ليس هناك التزام أو دعم من الإدارة العليا لتبنّي الحكومة الإليكترونيّة و أحيانًا يحدّون من عمليّة التنفيذ . ☐

أخرى اذكرها :

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30- هل الخطة المالية و التخطيط للموارد مرتبط بشكل سليم بالأهداف و الأولويات الاستراتيجية في مؤسستك؟

نعم ☐ لا ☐

a30- إذا كانت الإجابة (نعم) كيف:

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b30- إذا كانت الإجابة (لا) لماذا:

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31-هل يوجد أيّ تعاون بين مؤسستكم و المؤسسات المحلّيّة الأخرى ؟

نعم ☐ لا ☐

a31- إذا كانت الإجابة (نعم) كيف:

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b31- إذا كانت الإجابة (لا) لماذا:

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نعم ☐

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33-كيف تصف مستوي الاستعداد و النضج في مؤسستكم بالنسبة لتبنّي نظام الحكومة الإليكترونيّة ؟

I. مستوي الاستعداد و النضج عالاً فيما يخص تبنّي نظام الحكومة الإليكترونيّة و التكنولوجيا و التطبيقات المطلوبة. ☐

II. هناك استعداد و نضج إلى حد ما و لكن للمراحل المبكرة لنظام الحكومة الإليكترونيّة مثل إنشاء الموقع و نشر المعلومات الثابتة و ذلك بسبب عدم اكتمال البنية التحتية الأمر الذي حد من الاستكمال الفعلي لبعض التطبيقات مثل (عمليات التكامل و الدفع عن طريق الإنترنت و إنشاؤ قاعدة بيانات على الشبكة). ☐

III. البنية التّحتيّة غير ناضجة بدرجة كافية لتبنّي نظام الحكومة الإليكترونيّة وذلك أن بعض التّطبيقات الحاليّة تحتاج إلى إعادة هيكلة. ☐

أخرى اذكرها :

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34- في رأيك ما هي الفوائد المتوقّعة من تّبنّي نظام الحكومة الإليكترونيّة في مؤسستكم ؟

	العبارة	راضً تماماً	راضً	راضً ألى حد ما	غير راضً	غير راضً تماماً
		5	4	3	2	1
A34	تحسّين الإدارة ودعم عمليّة صنع القرار .	☐	☐	☐	☐	☐
B34	الحد من كلفة عمليّات إنجاز الخدمات و الاتّصالات بين الحكومة و المواطنين، و الأعمال و الموظّفون .	☐	☐	☐	☐	☐
C34	تحسين فاعليّة الخدمات الحكوميّة .	☐	☐	☐	☐	☐
D34	تقليص الوقت المستنفد في انجاز الخدمات الحكومية	☐	☐	☐	☐	☐
E34	سرعة التجهيز و الاستجابة لحاجات المواطنين و تطلعاتهم .	☐	☐	☐	☐	☐
F34	تنظيم ألأعمال الحكومية بشكل اكثر دقة.	☐	☐	☐	☐	☐
G34	زيادة تبادل البيانات و المعلومات بين المؤسسات .	☐	☐	☐	☐	☐
H34	تهيئة المؤسسة لكي تنجز الأعمال بفاعليّة أكثر.	☐	☐	☐	☐	☐
I34	تحسّين العلاقة خلال و بين المنظّمات .	☐	☐	☐	☐	☐

J34	تحسّين البنية التّحتيّة لتكنولوجيا المعلومات والاتصالات .	☐	☐	☐	☐	☐	☐
K34	تطوير مهارات الموظّفين و تحفيزهم .	☐	☐	☐	☐	☐	☐
L34	زّيادة إنتاجيّة المؤسسات.	☐	☐	☐	☐	☐	☐

35- عموماً كيف تصف مستوى النضج والاستعداد لنظام الحكومة الإليكترونيّة المملكة العربية السعودية؟

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إذا لديك أيّ اقتراحات مفيدة لتقييم مستوى النضج والاستعداد لنظام الحكومة الإليكترونيّة في المملكة العربية السعودية من فضلك إذكرها .

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شكراً لتعاونكم

Appendix A3: Interview Guide and Questions for Officials'

الحكومة الإليكترونيّة فى المملكة العربية السعودية

أنا طالب في مرحلة الدكتوراه في كلية علوم الحاسب الآلي والعلوم الرياضية ، بجامعة جون مورس في ليفربول ، المملكة المتحدة. كجزء من أطروحتي لنيل شهادة الدكتوراه فإنني أقوم حالياً بإجراء تقييم حول مدى الاستعداد والنضج لتقديم خدمات الحكومة الإلكترونية في المملكة العربية السعودية من وجهة نظر المسؤولين في المملكه العربية السعودية .

و سوف تبين هذه الدراسة بعد تحليل بياناتها عن طبيعة العوامل التي تواجه الحكومة الإلكترونية بشكلها الحالي و إيجاد الحلول المناسبة لها للنهوض بمستوى الخدمات الحكومية عبر الانترنت في المملكة العربية السعودية لتفي بالغرض المطلوب منها كما سوف تساعدنا في وضع إطار عمل شامل لتقييم استعداد و جاهزية نظام الحكومة الإليكترونيّة فى المملكة العربية السعودية.

مرفقاً مع هذا الخطاب استمارة استبيان تحتوي على مجموعة من الأسئلة أرجو منكم الإجابة عليها بمصداقية باستكمال الأسئلة بالتأشير على الإجابات التي ترونها مناسبة من وجهة نظركم . .إن هذا الاستبيان يستغرق منكم ما بين 10 – 15 دقيقه لإكماله إن شاء الله. علماً بأن لك الحرية التامة في ترك الاستبيان عند أي سؤال و تسلمه دون أي إحراج أو مساءلة. كما لا يتطلب الأمر منكم كتابة الإسم فى الإستبيان.

عزيزي المشارك / المشاركة إن المعلومات التي ستزودننا بها وردودكم سيتم التعامل معها بسرية تامة وسوف تستخدم فقط لأغراض البحث، و لن يطلع عليها إلا الباحث الرئيسي و المشرفيين على هذا البحث. وفي حالة وجود أي استفسار أو الحصول على نسخة مختصرة عن نتائج هذا المشروع يرجي الاتصال بي أو على البرفوسور (A. Taleb-Bendiab) رئيس قسم البحوث في كلية علوم الحاسب الآلي والعلوم الرياضية ، جامعة جون مورس في ليفربول و المشرف المباشر على هذا المشروع.

و أخيراً إنني احترم و اقدر الأعباء والالتزامات الكثيرة المفروضة على وقتكم و لكن أرجو شاكراً أن تعطوني وقتا لأستكمل هذا الاستفتاء ، و أي مساعدة تقدم لي سوف تكون موضع التقدير و الاحترام . وشكرا مرة أخرى علي تعاونكم معي في هذا الأمر المهم بالنسبة لي و لكم .

مع فائق الشكر و عظيم الإحترام ،،،،،،،،،،،،

الباحث

ربيع بن فؤاد كردي

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القسم الأول: معلومات أساسية

1- المنصب الحالي: .....

2- القسم: .....

3- الجنسية:

سعودي	☐	غير سعودي	☐

4- المستوي التعليمي:

الشهادة المتوسطة	☐	الثانوية العامة	☐
شهادة جامعية	☐	شهادة الماجستير	☐
شهادة الدكتوراه	☐		

أخري: .....

5- سنوات الخدمة في المنصب الحالي :

أقل من 1	☐	5-1	☐
10-6	☐	15-11	☐
20-16	☐	أكثر من 20	☐

القسم الثاني : القضايا المتعلقة بالحكومة الإلكترونية والاستعداد

6- هل تعتقد أن المملكة العربية السعودية تحتاج إلى أن تتبع نظام الحكومة الإليكترونيّة؟

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7- ما هي الأهداف الرئيسية لإستراتيجية نظام الحكومة الإليكترونيّة فى المؤسسات العامة فى المملكة العربية السعودية ؟

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8- كيف تلخّص عمليّة التّبنّي لتنفيذ برنامج الحكومة الإليكترونيّة فى المملكة العربية السعودية ؟

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9- هل هناك أيّ إطار عمل مستخدم حاليا لتقييم مدى استعداد ونضج نظام الحكومة الإليكترونيّة فى المملكة العربية السعودية ؟

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10- في رأيك ما هي المتطلبات الرّئيسيّة قبل اعتماد أفكار جديدة مثل الحكومة الإليكترونيّة في المؤسسات العامّة ؟

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11- ما هو تقييمك لما تم إنجازه حتى الآن في مجال الحكومة الإليكترونيّة فى المملكة العربية السعودية ؟

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12 - هل تعتقد أن التّعليم و التّدريب هما الحلول الرّئيسيّة لا ستيعاب نظام الحكومة الإليكترونيّة فى المملكة العربية السعودية ؟

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13 - ما هو تقييمك للتقدّم المحرز في قطاعات تكنولوجيا المعلومات والاتصالات فى المملكة العربية السعودية ؟

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14- هل يمكن أن تصف القدرة الكلّيّة الخاصة بتكنولوجيا المعلومات والاتصالات في المؤسسات العامّة فى المملكة العربية السعودية ؟

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15-هل يوجد مراكز لمعالجة البيانات تتولّي التّشغيل الآليّ لسير العمل الإداريّ، التّعاون، التّفاعل، و المصادقة على تبادل المعلومات ؟

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16- كيف تصف المقاومة للتّغيّر من المؤسسات و الموظّفين نحو أنظمة الحكومة الإليكترونيّة فى المملكة العربية السعودية ؟

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17- نظام الحكومة الإليكترونيّة تطبيق مثل أيّ تطبيقات الإنترنت الأخرى لكنّ حتّى اليوم لا تزال غير ناجحة (لماذا) ؟

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18- هناك بعض العناصر تحتاج إلى تقييم قبل / بعد البدء تمامًا لنظام الحكومة الإليكترونيّة، في نظرك كيف يمكن أن تقيّم العناصر التّالية ؟

a18- استعداد و جاهزية تكنولوجيا المعلومات والاتصالات (الأجهزة والبرامج):

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b18- استعداد و جاهزية المؤسسات:

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c18- استعداد و جاهزية القيادة و الموظّفين:

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d18 -استعداد و جاهزية المواطنين:

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e18- استعداد و جاهزية البيئة و المجتمع:

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أخرى اذكرها :

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19- هل الحكومة الإليكترونيّة مدفوعة بأشخاص معينين سياسيا أو جزءً لا يتجزأ من القطاعين العام و الخاص؟

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20- هل تطوّر نظام الحكومة الإليكترونيّة مسئوليّة كل مؤسسة عامة أم أنها مسئوليّة مؤسسة مركزيّة ؟

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21- يرجى تقديم تعليقك حول العوائق التي تواجة تطوير الحكومة الإليكترونيّة:

	العبارة	راضً تماماً	راضً	راضً ألى حد ما	غير راضً	غير راضً تماماً
		5	4	3	2	1
21A	مقاومة التغيير من الإدارة.	☐	☐	☐	☐	☐
21B	مقاومة التغيير من الموظفين في المنظمة.	☐	☐	☐	☐	☐
21C	القلق إزاء الأمن والسرية.	☐	☐	☐	☐	☐
21D	عدم وجود تعاون بين الإدارات.	☐	☐	☐	☐	☐
21F	التكاليف العالية للتكنولوجيا و الإعداد.	☐	☐	☐	☐	☐
21G	نقص المهارات بين المواطنين.	☐	☐	☐	☐	☐
21H	عدم وجود أجهزة مناسبة.	☐	☐	☐	☐	☐
21I	محدودية الموارد المالية.	☐	☐	☐	☐	☐
21J	القلق إزاء المخاطر والاحتيال.	☐	☐	☐	☐	☐
21K	عدم استجابة المواطنين.	☐	☐	☐	☐	☐
21L	عدم وجود تدريب لموظفي القطاع العام لتكنولوجيا المعلومات.	☐	☐	☐	☐	☐

أخرى اذكرها :

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القسم الثالث : القضايا المتعلقة بالحكومة الإلكترونية والحوسبة السحابية

22- هل هنال أي خطّة لاعتماد الحوسبة السحابية لتحسين خدمات الحكومة الإليكترونيّة فى المملكة العربية السعودية ؟

نعم ☐ لا ☐

a22- إذا (لا) لماذا:

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b22- إذا (نعم) كيف تصف خطّتك نظراً إلى :

البرامج كخدمة (**SaaS**)

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البنية التّحتيّة كخدمة (**IaaS**)

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الرّصيف كخدمة (**PaaS**)

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أخرى اذكرها :

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23- في مشاريع الحكومة الإلكترونية ، هل تعتبر أنّه من الضروري أن يكون هناك دّعم من السلطة المركزية و السياسية للإنتقال بنجاح إلى سحابة الحوسبة؟

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24- هل تعتقد أن الانتقال إلى الحوسبة السحابية سيخلق شراكةً جديدةً بين القطاعين العام والخاص لتطوير خدمات الحكومة الإلكترونية؟

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25- هل تعتقد أنّ الانتقال إلى الحوسبة السحابية ستكون أكثر تعقيداً بخصوص قضايا الأمن والثقة ؟

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26-في رأيك ما هي ا الفوائد المتوقّعة من الانتقال إلى الحوسبة السحابية:

	العبارة	راضٍ تماماً 5	راضٍ 4	راضٍ ألى حد ما 3	غير راضٍ 2	غير راضٍ تماماً 1
26A	الانتقال إلى الحوسبة السحابية سوف تحد من تكلفة العمليات لتقديم الخدمات والاتصالات بين الحكومة والمواطنين و الأعمال والموظفين.	☐	☐	☐	☐	☐
26B	الانتقال إلى الحوسبة السحابية سوف يحسين كفاءة الخدمات الحكومية.	☐	☐	☐	☐	☐
26C	الانتقال إلى الحوسبة السحابية سوف يخفض الوقت المستغرق في تقديم الخدمات الحكومية.	☐	☐	☐	☐	☐

26D	الانتقال إلى الحوسبة السحابية يساعد المنظمة في أن تكون أكثر مرونة .	☐	☐	☐	☐	☐
26E	الانتقال إلى الحوسبة السحابية سوف يزيد من كفأءة تبادل البيانات بين المنظمات.	☐	☐	☐	☐	☐
26F	الانتقال إلى الحوسبة السحابية سوف يتيح للمنظمة القيام بالأعمال على نحو أكثر فعالية.	☐	☐	☐	☐	☐
26G	الانتقال إلى الحوسبة السحابية سوف يحسين الاتصال داخل وبين المنظمات.	☐	☐	☐	☐	☐
26H	الانتقال إلى الحوسبة السحابية سوف يعزيز البنية التحتية لتكنولوجيا المعلومات والاتصالات.	☐	☐	☐	☐	☐
26I	الانتقال إلى الحوسبة السحابية سوف يزيد من الإنتاجية في المنظمة.	☐	☐	☐	☐	☐
26J	الانتقال إلى الحوسبة السحابية سوف يوفر القدرة على الاستفادة من قوة الحوسبة لتعزيز خدمات الحكومة الإلكترونية.	☐	☐	☐	☐	☐
26K	الانتقال إلى الحوسبة السحابية سوف يساعد على تقديم الخدمات المناسبة لمختلف المستخدمين اعتمادا على احتياجاتهم.	☐	☐	☐	☐	☐
26L	الانتقال إلى الحوسبة السحابية سيحد من الكلفة و الوقت المستغرق في عمليات تطوير المحتوي و التوزيع و التكرار.	☐	☐	☐	☐	☐

27-ما هي المخاوف الرّئيسيّة من الهجرة إلى الحوسبة السحابية ؟

	العبارة	راضً تماماً	راضً	راضً ألى حد ما	غير راضً	غير راضً تماماً
		5	4	3	2	1
27A	الأمن والخصوصية	☐	☐	☐	☐	☐
27B	توافر الخدمات وتخزين البيانات.	☐	☐	☐	☐	☐
27C	سرية البيانات للمنظمات.	☐	☐	☐	☐	☐
27D	فقدان السيطرة على خدمات الحكومة الإلكترونية والبيانات.	☐	☐	☐	☐	☐
27E	تكلفة وصعوبة الانتقال إلى الحوسبة السحابية.	☐	☐	☐	☐	☐
27F	تعقيد في إعادة هندسة الإجراءت و العمليات.	☐	☐	☐	☐	☐
27G	إعادة تدريب الموظفين.	☐	☐	☐	☐	☐
27H	عدم وجود ما يكفي من مقدمي خدمات الحوسبة السحابية.	☐	☐	☐	☐	☐

أخرى اذكرها :

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28- عموماً كيف تصف مستوى النضج والاستعداد لنظام الحكومة الإليكترونيّة في المملكة العربية السعودية؟

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إذا لديك أيّ اقتراحات مفيدة لتقييم مستوى النضج والاستعداد لنظام الحكومة الإليكترونيّة في المملكة العربية السعودية من فضلك إذكرها .

1- .....

2- .....

3- .....

4- .....

شكراً لتعاونكم

Appendix B: English Version

Appendix B1: Survey Questionnaire for Citizens

Dear participant,

In order to assist my PhD research, which is underway at the School of Computing and Mathematical Sciences, Liverpool John Moores University, UK; I will be delighted if you would complete the attached questionnaire. This anonymous questionnaire aims at assessing the readiness and maturity of e-government services in the Kingdom of Saudi Arabia.

All information collected will be treated with total confidentiality and only used for the purpose of my research. In anticipation thank you for your cooperation and support.

Please do not hesitate to contact me or my director of studies Professor A. Taleb-Bendiab (address enclosed below) should you require any further information concerning the project or to be kept informed of the project results.

Yours Faithfully

Rabea F Kurdi
PhD Research Student
The School of Computing and Mathematical Sciences,
Liverpool John Moores University,
Byrom Street, Liverpool,
L3 3AF, UK.
E-mail: r.kurdi@2009.ljmu.ac.uk

Brief Overview

The motivation for this research is to understand the e-government systems and readiness and the real situation of e-government in Saudi Arabia. The objective of this survey is to assess the current state of e-government as-is and to collect the citizens opinion about e-government service also to investigate the critical factors influencing adoption e-government service and to determine the factors that could keep government behind the advanced stages of the e-government.

I would highly appreciate if you kindly give a few minutes of your valuable time to complete an attached questionnaire. It should not take more than 10 – 15 minutes to complete it. Please read it carefully, and tick the box on the right hand side that most accurately reflects your opinion to each statement. Please note that your participation is voluntary and you can stop at any time and feel free to withdraw from the study, without giving any reason and without any detrimental effect. In case you may have any concerns or complaints you may contact Professor A Taleb-Bendiab, head of research at The School of Computing and Mathematical Sciences, Liverpool John Moores University, Byrom Street, Liverpool, L3 3AF, UK, 0151 2312489.

Section A: Personal Information

1- Age :

Less than 20	☐	20-24	☐
25-29	☐	30-34	☐
35-39	☐	40-44	☐
45-49	☐	50-54	☐
55-59	☐	>60	☐

2- Gender:

Male	☐	Female	☐

3- Nationality:

Saudi	☐	Non-Saudi	☐

4- Education Level:

Intermediate School	☐	High School	☐
Bachelor Degree	☐	Master Degree	☐
Doctoral Degree	☐		

Others: …….....

5- Occupation ……...……..

6- Monthly Income (SAR):

Less than 2,999	☐	9,000 – 11,999	☐
3,000 – 5,999	☐	12,000 – 14,999	☐
6,000 – 8,999	☐	15,000 – 19,999	☐
More than 20,000	☐		

Section B: Issues Related to Computer and Internet Experience

7- Have you ever used a computer?

Yes ☐ No ☐

8- Where do you use computer usually?

at home ☐ at office ☐

at a public access ☐

Others Please specify

……...……

9- How often do you use a computer a day?

Less than 1 ☐ 6 to 10 hours ☐

1 to 5 hours ☐ Over 10 hours ☐

10- What do you use a computer mainly for?

Internet applications ☐ Games and entertainment ☐

Office applications ☐

Others Please specify

……...……

11- Do you use the Internet?

Yes ☐ No ☐

12- How often do you use the Internet a day?

Less than 1 ☐ 6 to 10 hours ☐

1 to 5 hours ☐ Over 10 hours ☐

13- What do you use the Internet mainly for?

communication (email/chat) ☐ entertainment ☐

education / information search ☐ shopping ☐

work ☐ ☐

Others Please specify

……...……

14- What type of Internet connection do you have?

dial-up ☐ broadband (DSL , or cable) ☐

cell phone ☐ I do not have Internet access ☐

15- How do you rate the Internet connection?

very fast ☐ reasonable ☐

fast ☐ poor ☐

16- How do you rate the Internet prices?

Very expensive ☐ Cheap ☐

Expensive ☐

17- Overall, how do you rate your Internet and computer skills?

Expert User ☐ Novice User ☐

Advanced User ☐ Beginner/New Computer User ☐

Section C: Issues Related to E-government service

18- Are you aware of any e-government service in K.S.A?

Yes ☐ No ☐

If (Yes) how …..……..... ……..... 19- Are you ready to use it?

Yes ☐ No ☐

If (No) Why …… ……

20- What do you think about availability of the current e-government services?

All Services are available ☐ Services are partially available ☐

More Services are required ☐

Others Please specify …… ..…...……..

21- Do you access e-government websites (portals)?

Yes ☐ No ☐

21a If (No) Why …… ……

21b If (Yes) please answer the following questions

	Statement	Strongly Agree	Agree	Partly Agree	Disagree	Strongly Disagree
		5	4	3	2	1
b 1	The website provides necessary information and forms to be downloaded.	☐	☐	☐	☐	☐
b 2	The website provides helpful instruction for performing my task.	☐	☐	☐	☐	☐
b 3	The website quickly loads all the text and graphics.	☐	☐	☐	☐	☐
b 4	The website provides information precisely according to my needs.	☐	☐	☐	☐	☐
b 5	The information on the website is up-to-date.	☐	☐	☐	☐	☐
b 6	The website provides information I need at the right time.	☐	☐	☐	☐	☐
b 7	The information presented in this website is related to the subject matter.	☐	☐	☐	☐	☐
b 8	This website is well organised.	☐	☐	☐	☐	☐
b 9	The website is available at all times.	☐	☐	☐	☐	☐

b10	I know that the website is secure.	☐	☐	☐	☐	☐
b 11	I know that the website can be trusted.	☐	☐	☐	☐	☐
b 12	Interacting with the web site is a clear and understandable process.	☐	☐	☐	☐	☐
b 13	The web site is flexible to interact with.	☐	☐	☐	☐	☐
b 14	The web site has enhanced my effectiveness in searching for and using this service.	☐	☐	☐	☐	☐
b 15	The web site has provided a valuable service for me.	☐	☐	☐	☐	☐

22- Please provide your comment about the current e-government services in K.S.A

	Statement	**Strongly Agree**	**Agree**	**Partly Agree**	**Disagree**	**Strongly Disagree**
		5	**4**	**3**	**2**	**1**
22A	The lack of IT training programmes in e-government service.	☐	☐	☐	☐	☐
22B	Insufficient number of computers in organisations for public use.	☐	☐	☐	☐	☐
22C	The lack of confidence in the security, trust and privacy support in current e-government systems.	☐	☐	☐	☐	☐
22D	Non-availability of electronic signature.	☐	☐	☐	☐	☐
22E	Lack of qualified staff in the organisation to support e-government services.	☐	☐	☐	☐	☐
22F	Lack of qualified staff in the organisation concerning with security issues.	☐	☐	☐	☐	☐
22G	High cost of Internet and computer.	☐	☐	☐	☐	☐
22H	Lack of awareness and motivations about e-government services.	☐	☐	☐	☐	☐
22I	Slow access to e-government system and downloading.	☐	☐	☐	☐	☐
22J	Slow e-government transactions.	☐	☐	☐	☐	☐
22K	Technical problems, such as network and server malfunctions will effect on your attention to use e-government services.	☐	☐	☐	☐	☐
22L	Interaction with the e-government system would be clear if the leadership is committed to e-government project.	☐	☐	☐	☐	☐

23- If you have a cell phone do you prefer to use it to contact e-government service?

Yes ☐ No ☐

If (No) Why …..……...

…….....

24- Have you ever heard about Cloud Computing before?

Yes ☐ No ☐

If (Yes) How …….....

…….....

25- Overall, are you satisfied with e-government system and services in K.S.A?

Yes ☐ No ☐

If (No) Why ……...

……...

If you have any suggestions which will be helpful to enhance e-government services please list them below.

1) ……..
2) ……..
3) ……..

Thank you for your cooperation

Appendix B2: Survey Questionnaire for Staff

Dear participant,

In order to assist my PhD research, which is underway at the School of Computing and Mathematical Sciences, Liverpool John Moores University, UK; I will be delighted if you would complete the attached questionnaire. This anonymous questionnaire aims at assessing the readiness and maturity of e-government services in the Kingdom of Saudi Arabia.

All information collected will be treated with total confidentiality and only used for the purpose of my research. In anticipation thank you for your cooperation and support.

Please do not hesitate to contact me or my director of studies Professor A. Taleb-Bendiab (address enclosed below) should you require any further information concerning the project or to be kept informed of the project results.

Yours Faithfully

Rabea F Kurdi
PhD Research Student
The School of Computing and Mathematical Sciences,
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Byrom Street, Liverpool,
L3 3AF, UK.
E-mail: r.kurdi@2009.ljmu.ac.uk

Brief Overview

The motivation for this research is to understand the e-government systems and readiness and the real situation of e-government in Saudi Arabia. The objective of this survey is to assess the current state of e-government as is and to collect the staff opinion about e-government service also to investigate the critical factors influencing adoption e-government service and to determine the factors that could keep government behind the advanced stages of the e-government.

I would highly appreciate if you kindly give a few minutes of your valuable time to complete an attached questionnaire. It should not take more than 20 – 25 minutes to complete it. Please read it carefully, and tick the box on the right hand side that most accurately reflects your opinion to each statement. Please note that your participation is voluntary and you can stop at any time and feel free to withdraw from the study, without giving any reason and without any detrimental effect. In case you may have any concerns or complaints you may contact Professor A Taleb-Bendiab, head of research at The School of Computing and Mathematical Sciences, Liverpool John Moores University, Byrom Street, Liverpool, L3 3AF, UK, 0151 2312489.

Section A: Background Information

1- What is your current position?

Head of department	☐	Clerical	☐
Customer Service Rep	☐	IT Services	☐
Utilities Administration	☐	Others	☐

2- Department: …….....

3- Nationality:

Saudi ☐ Non-Saudi ☐

4- Education Level:

Intermediate School	☐	High School	☐
Bachelor Degree	☐	Master Degree	☐
Doctoral Degree	☐		

Others: …….....

5-Years of service at your Organisation / Department:

Less than 1	☐	1 - 5	☐
6 - 10	☐	11 - 15	☐
16 - 20	☐	more than 21	☐

6-Number of training courses attended :

6-a: General IT: 1-3	☐	4-6	☐
7-10	☐	11 and above	☐
No courses	☐		

6-b: More training course for the IT:

Yes	☐	No	☐

Please specify ……...…

...……

Section B: Issues Related to E-government and Technology

Section B Part 1 - ICT Infrastructure

7- Does your Organisation / Department have up to date hardware?

Yes ☐ No ☐

7a. If (yes) how …….

……

7b. If (No) why ……..

…….

8- Does your Organisation / Department have networked computers with up to date software?

Yes ☐ No computers ☐

8a. If (No) why …….

……

8b. If (Yes) please answer the following questions

I.	Few computers used for word processing.	☐
II.	Few networked computers used only for MIS and E-mail.	☐
III.	Fully networked computers with applications on central server in the organisation data center.	☐
IV.	Fully networked computers with applications on central server in state data center.	☐

Others Please specify ……..

……

9- How would you describe the ICT infrastructure progress in your Organisation / Department?

I.	Very good progress	☐
II.	Somewhat proper ICT infrastructure progress	☐
III.	Slow progress since the lack and shortage of funds	☐

Others Please specify …….

……

10- What are the main problems of ICT infrastructure in your Organisation / Department that will impact negatively on e-government system?

		YES	NO
A.	Integration problems (e. g. integrating data residing in multiple databases throughout the organisation, connecting the applications and processes within and between organisation departments).	☐	☐

B.	Unreliable networks and communication infrastructure.	☐	☐
C.	The required technologies and applications for e-government implementation are not compatible with existing applications and systems in the organisation due to their complexity.	☐	☐

Others Please specify ……...

..……..

Section B Part 2 – Network Infrastructure

11 - Does your Organisation / Department have intranet communication as a part of ICT infrastructure?

Yes ☐ No ☐

11a. If (No) why ……

……

11b. If (Yes) how important is the following statement for your Organisation / Department?

	Statement	Strongly Agree	Agree	Partly Agree	Disagree	Strongly Disagree
		5	4	3	2	1
I.	Improving the communication and coordination between employees within the Organisation / Department.	☐	☐	☐	☐	☐
II.	Enhance the quality of decision making process in the Organisation / Department management.	☐	☐	☐	☐	☐
III.	Empowerment the government data access and knowledge sharing at all levels in Organisation / Department.	☐	☐	☐	☐	☐
IV.	Reduce the costs and time of content development, duplication, distribution and usage.	☐	☐	☐	☐	☐

12- What Type of Internet Connection do you have at your Organisation / Department?

I.	Modem dial-up – dedicated to Internet and e-mail.	☐
II.	Modem dial-up – shared with other functions, e.g., fax, telephone.	☐
III.	Broadband – cable.	☐
IV.	Organisation/ Department has no Internet connection.	☐

Others Please specify ……

……

13- How would you describe the access condition to the Internet in your Organisation / Department?

I.	Individual employees have Internet access through a municipal network.	☐
II.	The Organisation / Department have Internet access through network or departmental stand-alone systems.	☐
III.	The Organisation / Department share Internet access through single stand-alone system.	☐
IV.	Employees obtain work-related Internet access through home or personal computers.	

Others Please specify ……

……

Section B Part 3 – Information System and Security

14- Please provide your comments about maturity level of Information System in your Organisation / Department to conducting online transactions?

	Statement	Strongly Agree	Agree	Partly Agree	Disagree	Strongly Disagree
		5	4	3	2	1
14A	Information on the organisation's website is free from errors.	☐	☐	☐	☐	☐
14B	Information on the organisation's website is up-to-date.	☐	☐	☐	☐	☐
14C	Information on the organisation's website is relevant to the site.	☐	☐	☐	☐	☐
14D	Information on the organisation's website is easy to read and understand.	☐	☐	☐	☐	☐
14E	The organisation's website always works correctly.	☐	☐	☐	☐	☐
14F	The organisation's website provides necessary information and forms to be downloaded.	☐	☐	☐	☐	☐
15G	The organisation's website provides necessary transactions to be completed and allows forms to be submitted on-line.	☐	☐	☐	☐	☐
14K	The organisation's website provides helpful instructions.	☐	☐	☐	☐	☐
14L	The organisation's website is secured.	☐	☐	☐	☐	☐
14M	The organisation's website is accessible to users with disabilities.	☐	☐	☐	☐	☐

15- How often do you collect a feedback from citizens and businesses regarding to the e-government you offer in your Organisation / Department?

Monthly ☐ Quarterly ☐

Yearly ☐ Whenever need it ☐

16- Does your organisation use the feedback to take corrective measures in order to improve the e-government system and services provided?

Yes ☐ No ☐

16a. If (yes) how ……

……

16b. If (No) why ……

……

17- How you would describe the security systems for the ICT infrastructure in your Organisation / Department?

		YES	NO
A.	Reliable security systems have been configured to ICT infrastructure and organisation e-government website.	☐	☐
B.	Somewhat reliable systems that protect the ICT infrastructure but they need more adjustments and new protection technologies for organisation website.	☐	☐
C.	Unreliable security systems and experiencing of many security holes in the ICT infrastructure and lack of necessary technologies for protecting the organisation web site contents.	☐	☐

Others Please specify ……....

..……..

18- Please describe security technologies and approaches that your Organisation / Department have applied to protect the ICT infrastructure and the website contents?

I. Public Key Infrastructure (PKI) ☐

II. Biometrics systems ☐

III. Intrusion Detection systems ☐

IV. Smart Cards ☐

V. Digital Certificate ☐

VI. Firewalls ☐

Others Please specify ……

……

Section C: Issues Related to E-government and Organisation / Department

19- Does your Organisation / Department have a clear vision and realise the significance of adoption e-government system?

Yes ☐ No ☐

19a. If (yes) how ……..

……..

19b. If (No) why ……

……

Section C - Part1 Strategy and planning

20- Have your Organisation / Department set up a strategy plan for adoption e-government system?

Yes ☐ No ☐

20a. If (yes) how ……

……

20b. If (No) why ……..

……..…

21- What is the future strategic action for the implementation of the e-government system in your Organisation / Department?

I.	Expand the existing ICT infrastructure in the organisation.	☐
II.	Strength the security systems of e-government website by installing new protection technologies and approaches to provide secure transactions.	☐
III.	Incorporate advanced ICT features and tools to the e-government website such as online payment system, online customised public profile, data transfer technology, and electronic records and knowledge management	☐
IV.	Generate citizen interactive conversations area through email systems or online forums with constituents or government officials.	☐
V.	Focus on the integration issue by connecting data, processes and applications between the government organisations.	☐

Others Please specify ……..

……...

22- What is the level of support in your Organisation / Department towards the adoption of e-government system?

YES **NO**

A. There is an active commitment and support from top management who pushed toward adoption of e-government and able to provide the necessary funds. ☐ ☐

B. There is somewhat commitment and support from top management to the adoption of e-government and it is not sufficient throughout the process of implementation. ☐ ☐

C. In most cases the top management pays no attention to the adoption process of e-government. ☐ ☐

D. There is no commitment and support from top management to the adoption of e-government and sometimes they restrict the process of implementation. ☐ ☐

Others Please specify …….....

..……..

23- Does the organisation utilise a strategic budgeting process that reflects the organisational needs and objectives?

Yes ☐ No ☐

23a. If (yes) how ……

……

23b. If (No) why ……

……

24-Does the Financial and resource planning process link appropriately to objectives and strategic priorities in your organisation?

Yes ☐ No ☐

24a- If (yes) how ……

…….

24b- If (No) why ……..….

……

25-Does your Organisation / Department have any cooperation with the other local Organisation / Department?

Yes ☐ No ☐

25a. If (yes) how ……

…….

25b. If (No) why ……..

……

Section C – Part 2 Awareness and Training

26- Are you aware of any e-government system within your organisation?

Yes ☐ No ☐

If (yes) how ……

……

27- Have you ever been trained to use e-government system?

Yes ☐ No ☐

If (No) Why ……..

……..

28- What type of training?

Beginners/introduction ☐ Intermediate ☐

Specific training ☐

Others Please specify ……..

……

29- Where does your Organisation / Department conduct its ICT training courses for staff?

Private Training Institute ☐ State recommended Training Facilities ☐

Department Training Facilities ☐ Department of Information Technology ☐

Others Please specify ……..

……..

30- Overall, Could you please describe the ICT training strategy that has been applied in your Organisation / Department?

		YES	NO
A.	There is a clear vision for the importance of training strategy and top management supports this vision and understand the needs of such training courses for the organisation's staff	☐	☐
B.	The training strategy plan for the organisation is set up but not completely followed it due to the lack of support from top management to staff.	☐	☐
C.	There is no training strategy plan in the organisation / department.	☐	☐

Others Please specify ……....

..……..

Section C – Part3 Staff General Attitudes toward E-Government and Readiness

31- How would you describe the maturity and readiness level in your organisation to the adoption of e-government system?

I. The maturity level is high and being formed to employ e-government system required technologies and applications. ☐

II. Somewhat mature but for early phases of e-government system (creating website, publishing static information) since the functional and performance of IT infrastructure is incomplete which limits actual use of some application such as integration, payment, and online database. ☐

III. The infrastructure is not mature enough for e-government system process since some existing applications require expensive custom of configuration. ☐

Others Please specify ……..

……

32- In your opinion what are the expected benefits of adoption e-government system in your Organisation / Department?

	Statement	Strongly Agree 5	Agree 4	Partly Agree 3	Disagree 2	Strongly Disagree 1
32A	Improve management and support decision making process.	☐	☐	☐	☐	☐
32B	Reducing operations cost of services delivery and communications between government and citizens, business and employees.	☐	☐	☐	☐	☐
32C	Improving the efficiency of government services.	☐	☐	☐	☐	☐
32D	Reducing amount of time spent on government services delivery.	☐	☐	☐	☐	☐
32E	Quick processing and response to citizen's needs and expectations.	☐	☐	☐	☐	☐
32F	More organised government business process.	☐	☐	☐	☐	☐
32G	Increase the exchange of data between organisations.	☐	☐	☐	☐	☐
32H	Allow the organisation to do businesses more effectively.	☐	☐	☐	☐	☐
32I	Improve the connection within and between organisations.	☐	☐	☐	☐	☐
32J	Enhance the ICT infrastructure.	☐	☐	☐	☐	☐
32K	Developing new skills and motivations for staff.	☐	☐	☐	☐	☐
32L	**Increase the organisation's productivity.**	☐	☐	☐	☐	☐

If you have any suggestions which will be helpful to assessing the readiness and maturity of e-government please list them below.

4) ……

5) ……

6) ……

Thank you for your cooperation

Appendix B3: Interview Guide and Questions for Officials'

Dear participant,

In order to assist with my PhD research, which is underway at the School of Computing and Mathematical Sciences, Liverpool John Moores University, UK; I will be delighted if you would complete the attached questionnaire. This interview aims at assessing the readiness and maturity of e-government services in the Kingdom of Saudi Arabia.

All information collected will be treated with total confidentiality and only used for the purpose of my research. In anticipation thank you for your cooperation and support.

Please do not hesitate to contact me or my director of studies Professor A. Taleb-Bendiab (address enclosed below) should you require any further information concerning the project or to be kept informed of the project results.

Yours Faithfully

Rabea F Kurdi
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The School of Computing and Mathematical Sciences,
Liverpool John Moores University,
Byrom Street, Liverpool,
L3 3AF, UK.
E-mail: r.kurdi@2009.ljmu.ac.uk

Brief Overview

The motivation for this research is to understand the e-government systems and readiness and the real situation of e-government in Saudi Arabia. The objective of this survey is to assess the current state of e-government as-is and to collect the officials opinion about e-government service also to investigate the critical factors influencing adoption e-government service and to determine the factors that could keep government behind the advanced stages of the e-government.

Please note that your participation is voluntary and you can stop at any time and feel free to withdraw from the study, without giving any reason and without any detrimental effect. In case you may have any concerns or complaints you may contact Professor A Taleb-Bendiab, head of research at The School of Computing and Mathematical Sciences, Liverpool John Moores University, Byrom Street, Liverpool, L3 3AF, UK, 0151 2312489.

Section A: Background Information

1- Position: …….....**.....**

2- Department: …….....

3- Nationality:

Saudi	☐	Non-Saudi	☐

4- Education Level:

Intermediate School	☐	High School	☐
Bachelor Degree	☐	Master Degree	☐
Doctoral Degree	☐		

Others: …….....

5- Years of service at your position:

Less than 1	☐	1 - 5	☐
6 - 10	☐	11 - 15	☐
16 - 20	☐	more than 20	☐

Section B: Issues Related to E-government and Readiness

1- 6- Do you think that K.S.A needs to pursue e-government system?

……

……

……

……

……

2- 7- What are the key goals of the e-government system strategy for public organisations in the K.S.A?

……

……

……

……

……

8- How would you summarize the adoption process to implementation of e-government in the K.S.A?

……

……

……

……

……

9- Is there any framework currently used for assessing the readiness and maturity of e-government system in K.S.A?

……

……

……

……

……

10- In your opinion what are the main requirements before adopting new ideas like e-government to in public organisations?

……

……

……

……

……

5- 11- What is your assessment for what has been done so far in the area of e-government in K.S.A?

……

……

……

……

……

6- 12- Do you believe that education and training are the main solutions for the uptake of e-government in K.S.A?

……

……

……

……

……

13- What is your assessment of the progress of the ICT sectors in K.S.A?

……

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……

……

……

7- 14- Can you describe the overall capacity of ICT in the public organisations in K.S.A?

……

……

……

……

……

8- 15- Are there a data centers to handle the administrative workflow automation, collaboration, interaction, authenticated exchange of information?

……

……

……

……

……

16- How would describe resistance to change from the organisations and staff towards the e-government systems?

……

……

……

……

……

12 17- E-government system is like any other Internet applications but until today still unsuccessful (why)?

……

……

……

……

……

18- There are some components needs to be assessed before launching fully of e-government system, how you can assess the following components?

18a. ICT (Hardware and Software) Readiness

……
……
……

1- 18b. Organisations Readiness

……
……
……

3- 18c. Leadership and staff Readiness

……
……
……

4- 18d. Citizens Readiness

……
……
……

5- 18e. Environment and society Readiness

……
……
……

Others Please specify

……
……
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……
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……

……

6-

19- Is the e-government purely driven by political appointees or embedded in the public sectors and independent of a particular appointee?

……
……
……

20- Is the e-government development the responsibility of each public organisation or is it a responsibility of a central e-government organisation?

……
……
……

21- Please provide your comment about the barriers face e-government development

	Statement	Strongly Agree	Agree	Partly Agree	Disagree	Strongly Disagree
		5	4	3	2	1
21A	Resistance to change within administration.	☐	☐	☐	☐	☐
21B	Resistance to change from Staff within the organisation.	☐	☐	☐	☐	☐
21C	Concerns about security and confidentiality.	☐	☐	☐	☐	☐
21D	Lack of co-operation between administrations.	☐	☐	☐	☐	☐
21F	High technology set-up costs.	☐	☐	☐	☐	☐
21G	Lack of skills among citizens.	☐	☐	☐	☐	☐
21H	Lack of high level championship.	☐	☐	☐	☐	☐
21I	Limited availability of financial resources.	☐	☐	☐	☐	☐
21J	Concerns about risk and fraud.	☐	☐	☐	☐	☐
21K	Citizens' unresponsiveness.	☐	☐	☐	☐	☐

21L	Lack of technology / trained public sector IT staff.	☐	☐	☐	☐	☐

Others Please specify:

……
……

Section C: Issues Related to E-government and Cloud Computing

22- Is there any plan to adopt cloud computing to enhance e-government services in the K.S.A?

Yes ☐ No ☐

22a. If (No) why

……
……
……

22b. If (Yes) how would you describe your plan regarding to :

Software as a Service (SaaS)

……
……
……

Infrastructure as a Service (IaaS)

……
……
……

Platform as a Service (PaaS)

……
……
……

Others Please specify

……
……
……

23- In E-government projects, do you consider that it's necessary to have centralised authority and political support to successfully migration to cloud computing?

……
……
……

24- Do you think that migration to Cloud Computing will create a new partnership between public and private sectors to provide a better e-government service?

……
……
……

25- Do you think that the migration to Cloud Computing will be more complicated regarding to the security and trust issues?

……
……
……

26- In your opinion what are the expected benefits of migration to Cloud Computing.

	Statement	Strongly Agree	Agree	Partly Agree	Disagree	Strongly Disagree
		5	4	3	2	1
26A	Migration to Cloud Computing will reduce the costs and time of content development, duplication, distribution and usage of e-government services.	☐	☐	☐	☐	☐
26B	Migration to Cloud Computing will reduce operations cost of services delivery and communications between government and citizens, business and employees.	☐	☐	☐	☐	☐
26C	Migration to Cloud Computing will Improve the efficiency of government services.	☐	☐	☐	☐	☐
26D	Migration to Cloud Computing will reduce amount of time spent on government services delivery.	☐	☐	☐	☐	☐

26E	Migration to Cloud Computing will help the organisation be more flexible.	☐	☐	☐	☐	☐
26F	Migration to Cloud Computing will increase the exchange of data between organisations.	☐	☐	☐	☐	☐
26G	Migration to Cloud Computing will allow organisation to do businesses more effectively.	☐	☐	☐	☐	☐
26H	Migration to Cloud Computing will improve the connection within and between organisations.	☐	☐	☐	☐	☐
26I	Migration to Cloud Computing will enhance the ICT infrastructure.	☐	☐	☐	☐	☐
26J	Migration to Cloud Computing will Increase organisation productivity.	☐	☐	☐	☐	☐
26K	Migration to Cloud Computing will provide the ability to immediately tap computing power to enhance e-government services	☐	☐	☐	☐	☐
26L	Migration to Cloud Computing will Provide appropriate services to different users, based on their needs	☐	☐	☐	☐	☐

Others Please specify:

……

……

……

27- What are your main concerns about the migration to Cloud Computing?

Statement	Strongly Agree	Agree	Partly Agree	Disagree	Strongly Disagree
	5	4	3	2	1

27A	Security and Privacy.	☐	☐	☐	☐	☐
27B	Availability of services and storage data.	☐	☐	☐	☐	☐
27C	Confidentiality of the organisations data.	☐	☐	☐	☐	☐
27D	Loss the control of e-government services and data.	☐	☐	☐	☐	☐
27E	Cost and difficulty of migration to the cloud computing.	☐	☐	☐	☐	☐
27F	Complexity of business processes re-engineering.	☐	☐	☐	☐	☐
27G	Complexity of staff retraining.	☐	☐	☐	☐	☐
27H	Lack of enough cloud computing providers.	☐	☐	☐	☐	☐

Others Please specify:

……
……
……

28- Overall how would you describe the maturity and readiness level of e-government system in K.S.A?

……
……
……

If you have any suggestions which will be helpful to assessing the readiness and maturity of e-government please list them below.

1) ……
2) ……
3) ……
4) ……

Thank you for your cooperation