City Research Online

City, University of London Institutional Repository

Measuring the development of Saudi Arabia as an information society

City, University of London

Supervisors

Prof: David Bawden

And

Dr: Lyn Robinson

A thesis submitted for the degree of

Doctor of Philosophy in Information Science

Ohoud Alabdali

2019

Abstract

This thesis describes a study of the development of Saudi Arabia as an information society while developing a methodology which may be applicable to development of information societies generally. This is important because the modern world has changed dramatically from an industrial society. The promise of such a dynamic has radically changed all aspects of our lives, including knowledge dissemination, social interaction, economic and work practices, and political activity. The focus of this study is on measuring the development of Saudi Arabia as an information society by using ICT indicators in the educational and health sectors which compares the development of informational society between the United Arab Emirates and the United Kingdom using a questionnaire survey approach. These indicators focus on: e-services, E-HRM, scientific research, e-communication and e-learning. The research uses the theoretical insights of Webster and Gardin as a framework for this study.

The overall aim of the research is to explore and measure the current state of Saudi Arabia as an information society. The objectives include: measurement of the ICT infrastructure in the health and educational sectors; measurement of the willingness of Saudi people to use new technology; comparison of Saudi society with other societies regarding technology adoption; identification of the obstacles preventing Saudi Arabia from becoming an information society; and providing an approach that can be used to measure the progress of any country towards becoming an information society.

The research concludes that Saudi Arabia's informational society is inferior to the UAE and UK. Nonetheless, Saudi Arabia is willing to implement informational technology to achieve wider benefits as the other two countries. Lack of experience, time and trust in new systems are causing hindrance in Saudi Arabia's progress to become an informational society.

Contents

List of Figures

List of Tables

Glossary of Acronyms

IS	-	Information society
ICTs	-	Information and communication technology
ITU	-	International Telecommunication Union
WSIS	-	World Summit on the Information Society
UN-ESCWA	-	Economic and Social Commission for Western Asia
OECD	-	Organization for Economic Cooperation & Development
UIS	-	UNESCO Institute for Statistics
UN	-	United Nations
HR	-	Human resources
ISCO	-	Internet standards, education and policy development
E-HRM	-	E-human resource management
UAE	-	United Arab of Emirates
UK	-	United Kingdom

Chapter one

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

Today the world has witnessed improvements in terms of new technology and information sharing and all that leads to the creation of a new form of society, known as an information society. This society has different features to other societies: in this society, information has the power to change how the world thinks or makes decision. People in the modern society can share information, images, news and many different types of data by using the new technology, particularly social media.

The global information society is developing quickly its contributions towards accelerating a convergence of telecommunications, multimedia broadcasting, information and communication technologies will lead to new products, bring new services into existence and demonstrate new ways to manage business and trade. At the same time, it will create business, social and professional opportunities that will result in opening new markets for competition, as well as foreign investment and participation (Webster, 2014).

The World is witnessing a new type of society in which the technology and information development serve as the main indicator of how advanced a country is. According to (Sun and Zhang, 2015) the new technology will play an important role in future markets and will combine to build an information society.

In a modern society development is not always related to wealth; in these societies, the ability to produce and deal with information is considered the backbone of the society. It is becoming important to use approach to measure the society, in this case, ICT indicators. This thesis deals with ICT indicators, which are provided by some of the international organizations such as (International Telecommunication Union, World Summit on the Information Society) to measure Saudi society in terms of information technology and employment.

This thesis measuring the development of an information society in Saudi Arabia. However, comparison with UAE and UK will be made, to compare and assess the development of information society in these countries. In the last thirty years, information science has become one of the most important sciences in the modern world that is because it serves all sciences through information services (Robbio and Nair ,2017).Therefore, the idea of this project topic arose from the researcher's interest in the subject of information societies and the important role information plays in modern society, especially its role in transforming Saudi society into an information, or knowledge, society.

1.2 Motivation for the study

The reason that the researcher is interested in information societies is that she has studied the subject in both Arabic and British institutions and noticed a great difference between how they treat it for example, in United Kingdom Information science is a stand-alone science and not part of computer science unlike in Saudi. Moreover, in Saudi Arabia, an information society is not considered to be of great importance to the public and, the researcher has noticed, through her master's studies in the UK, how important the subject is.

Today, Saudi Arabia is considered as one of the richest nations of the world. (Olumyuiwa, Sohaib and Ling, 2018). However, in terms of information technology, different sources have reported contradictory findings on this subject matter. Despite tremendous development in ICT sector and keen interest of Saudi government in this regard, the society could not be regarded as the highly advanced in terms of communication and information technology (Masadi, 2015). Rigid cultural norms and strict monitoring policies might be two of many reasons behind the lack of advancement. However, during past few years, increased internet penetration has brought some changes in overall societal conduct. If Saudi Arabia succeeds in making effective usage of available resources in this dimension, it will bring the country to the forefront of other advanced states. This doctoral research would make some contribution in this regard by proposing meaningful insights to policymakers and Saudi government who are trying hard for transforming Saudi Arabia into a true information society

Saudi Arabia can no longer rely on oil as its only national resource; in fact, Saudi Arabia must invest in information sectors in order to become a developed country. However, most studies in this field focus on the western world with little if any valid research on Saudi (Masadi, 2015). Therefore, the researcher has identified this opportunity to carry out research that studies the information society regarding Saudi Arabia.

Recently, most of the studies on information societies have deal with the western world; therefore, as a Saudi PhD student of information science, the researcher has identified this opportunity to study this topic in depth, and to add to our understanding of the development of information society worldwide.

According to the study by (Statista, 2019) Saudi users are the largest active twitter users in the Arab world. The key question is whether this finding means that Saudi society has already become an information society. To answer this question, firstly we must define the information society and then explain how to measure it. In this study, the researcher will provide different definitions of information society and devise methods for measuring information society development, by measurement of use of information and communications technology (ICT) approaches which are regarded as indicators for measuring the progress of a country as an information society. New metrics are necessary because the ICT indicators used until now typically measure only such factors as the speed of the internet and the numbers of computers, some local studies assessed the importance of transformation of electronic government but without measurement. For example, (Al-Shehry 2014).

These approaches will used for the study of specific sectors in Saudi Arabia, such as healthcare, and will be focused on specific areas, such as digital communications. The results will then be compared with the United Arab Emirates (UAE) which is one of advanced Arab country as an information society (Itu.int, 2017) and the United Kingdom (UK) which has a different context, as a developed Western European country (Itu.int, 2017).

The research will focus on ICT indicators that are related to information culture and information literacy in specific sectors, such as health and education. The goal of this thesis is not measuring the factors such as speed/quality of the Internet connection or the number of computers in the society, as this is not the best way to measure the

information society (Servais, 2003). Therefore, this thesis will measure the development of Saudi Arabia as an information society by using ICT indicators within specific sectors. The researcher will use ICT indicators designed by international bodies for the purpose of measuring ICT development in general society. However, this study will use indicators that belong to key organizations and will combine them in order to create a framework more suitable for measuring development of information society in the health and educational sectors. It is hoped that this study will be a useful guide for policy-makers in Saudi Arabia. It should also provide a general method for studying the development of information society in any country.

1.3 The Concepts and Development of Information Society

"Information society is a term used to describe the most recent stage of social History." (Karvalics, 2007, p. 21).

Throughout the last hundred years, agriculture and industry have been the main sources for economic development. However, in today's modern society, information has become the primary economic source. The idea of regarding information as a source of economic and social growth is not new; in fact, it was introduced several decades ago, when researchers such as (Machlup,1962) and (Porat and Rubin,1977) began studies to link economics to the information society (Mansell, 2009).

Fritz Machlup (1962) was one of the first individuals to put forward the concept of an information society. From the 1930s, he studied the impact of patents on research, which is summarised in his book "*The production and distribution of knowledge in the United States*" published in (1962). The concept identified and developed by Machlup in his book was translated into Japanese and Russian and is widely acknowledged. Moreover, the challenges of technology along with its role in modern society is discussed using several concepts and labels in scientific literature.

For example, Systems theory, Social construction of technology and Technological Imperative. (Gil-García, Pardo and Luna-Reyes, 2018).

With the discussion of development of information society, network capitalism, informational capitalism, network society, post-modern society, post-industrial society,

information economy or ideas of a knowledge societies are closely related topics which are debated in the last many decades. However, the five sectors of knowledge identified by Machlup (1962) include information services, information technologies, mass media, research and development, and education. Since then, there have been several alternatives presented in the definition and meaning of information society which has led to its development for example; Béla Murány defined the information society as "A new type of society in which humanity has the opportunity to lead a new way of life, to have a higher standard of living, accomplish better work, and to play a better role in society thanks to the global use of information and telecommunication technologies." (Karvalics,2007, pp. 10). Also, some new concepts were introduced such as Information commodities, Information industry Information work (Karvalics, 2009).

However, research on information society, as it is currently understood, started in the 1970s, when Daniel Bell wrote "*The coming of post-industrial society*" (Bell,1972), there had been some earlier works that focused on the importance of the role of information in the economic sector, (Stigler,1961) and (Schramm ,1964). Generally, the definition of an 'information society' depends on the level of information the nation acquires, or their goal s into one. There are clear differences in goals between developed countries and developing countries in terms of dealing with information and knowledge, and in the purpose of becoming an information society. (Mansell, 2009).

Governments in developed countries, such as the United States, the UK and Japan, realized the role of information as a new type of economic source (Mansell, 2009).

The Japanese version of the concept Jahok shakai (1960) was first presented during a conversation between Kurokawa and Umeaso (1961), (Ziemba and Zelazny 2013).

According to Servase (2011), the European Commission pointed out the importance of information as the solution for all humankind's problems: "Improve access to information, enhance democracy and social justice, promote employability and lifelong learning, strengthen the capacity of the EU economy to achieve high and sustainable growth and employment, achieve and enhance equal opportunity between men and women, promote inclusion and support people with special needs and those lacking opportunities to improve their position, and improve quality and efficiency of public administration." (Servase, 2011, p. 3).

For example, in Germany, one example of a developed nation, the German Council for Research, Technology and Innovation defines the 'information society' as "a type of society where the acquirement, storage, processing, exchange, diffusion and utilization of knowledge are inclusive of their technological possibilities of interactive communication." (Degele, 2010, p.744). According to Degele, regarding Germany, knowledge is the key factor for economic growth and technological advances.

Taiplar (2012) has conducted research in context of Finland to explore factors that helped the Finnish nation to transform into information society. The findings revealed certain factors that helped the country to earn its reputation as a leading information society in the 1990s. It mainly included the success of Nokia mobile phones. This reputation served to make Finland a forerunner of the information age, according to global media. Based on it, the author claimed that there are some factors that contribute to making countries leading information societies, including mobile-phone penetration rate, Internet hosts and web connections. The importance of higher mobile penetration to facilitate the transformation into an information society is also evident from the fact that the European Commission set up a plan in 2011 to help elderly European citizens to use the information and communication technology services, products and applications. The main aim of this plan was to ensure to help elderly people to be involved and to be a part of an information society (Ec.europa.eu, 2011).

In developing countries such as Saudi Arabia, according to a report by the Communication and Information Technology Commission (2003), the purpose of transforming society into an information society is to improve people's lives through the development of specific sectors, such as education, as well as to provide improved electronic services. (Mcit.gov.sa, 2003).

As a result of the increased number of people that have joined the global information society and the importance of new technology in modern lives, aside from the significant role that it plays in the information society, it has become necessary to set basic ICT indicators for measuring these societies.

Looking at an example from the Arab world, according to the UAE policy-makers, the best way to transfer a society into an information society is by using the new technology, especially e-government. Moreover, believing that electronic and information economics

is the main determinant of competition in modern society, the UAE is dedicated to changing from being a productive community based on products to a numerical economy community based on information (Al-khoury, 2013).

1.3.1 Perspectives of previous scholars on the Information Society

In establishing the background for this study, it is essential for the researcher to consider as many definitions of the concept as possible. In fact, this definition can differ from one author to another, as will be noted in the following section.

According to Webster (2006), the term 'information society' is used in academic and social contexts, as well as in the daily lives of individuals. Moreover, this concept appears everywhere. In other words, in the modern society, people find themselves inundated with concepts of information whether via print or online media, including TV and radio.

Regarding this fact, Webster (2006) states that, the term 'information society' is misleading, as it is hard to define the concept behind it as the community wrongly understands the term 'information'; also, theorists wrongly judge that development in social standards are directly correlated to development in information societies. Unfortunately, these obstacles still exist in one way or another. It is very important to consider the fact that there are no global agreements concerning the definitions of 'information society' (Ajala, Ojo and Olugbara, 2013).

Mansell (2009, p.2) defined, "an information society as a constellation of developments arising from the growing use of communication technologies by the acquisition, storage and processing of information along with the role of information in supporting the creation and exchange of knowledge.".

Some writers highlight that the possession of information in this type of society is considered power, unlike wealth in the case of others. For example, Masuda (1981) argued that, the information society is totally different from any other society; "it is a new type of society where the possession of information and not material wealth is the key factor behind its transformation and development." (Masuda, 1981, p.157).

Green's (2002) references, to the information society are sometimes described as 'post-industrial societies. He also claims that modern society is no longer based on wealth. However, Martin (1988) defined, the information society as "an advanced, post-industrial society of a type found most commonly in the West. It is character raised by a high degree of computerization and large volumes of electronic data transmission, and by an economic profile heavily influenced by the market and employment possibilities of information technology." (Martin, 1988, p. 37). Whereas Matwly (2012) describes information societies as societies that look at information as an asset and a strategic resource.

There are several general concepts related to the term 'information society'; So, it is important to distinguish the difference between the following three concepts: data, information and knowledge. Firstly, "data are the facts and statistics about a topic, whereas information comprises the facts that people learn about topics or people. Finally, knowledge consists of the facts, information and skills that users learn through experiences.". (Ritiz, 2004, p46).

According to Bawden and Robinson (2012), to count as information, data must be organized, meaningful, and true. Also, data must be relevant to be considered knowledge. In information science, information and knowledge are considered to be incompatible and they are different in terms of the way the idea of the latter is understood. Information is considered to be knowledge that can be communicated between individuals or stored, or 'knowledge in transit'. Information, when 'refined', is knowledge (Bawden and Robinson, 2012). For the purposes of this study, we consider both information and knowledge, however defined, to be the basis for an information society.

There is no exact and agreed definition of the concept of an information society (May 2002; Black, Muddiman and Plant, 2016). Therefore, different viewpoints about the concept are argued by different scientists. The table below lists the various contradicting viewpoints:

Bell (1973)	Martin (1985)	Webster (2014)
Social	Technology	Technology
Political	Economy	Economy
Cultural	Social	Culture
Technology	Cultural	Occupational
	Political	Spatial

Table1: Represent the three authors' viewpoints about the information society.

Firstly, the study will explain the information society from the perspective proposed by Daniel Bell (1973). Also, he defined information society from four different dimensions, including social, political cultural and technological. Bell has been regarded as the foremost researcher on information society. On the other hand, Duff (1998) has explained his perception by discussing the development from the (1960s to the 1990s) arguing Bell's position from three distinguishable elements: first related to information workforce of post-industrial era, second related to scientific knowledge, and third related to computers and information revolution. The Information society thesis proposed by Bell could be well-comprehended by synthesizing these elements. However, Duff (2013) criticized, Bell's approach by contending that Bell's research lacked the scientific standard. Explaining further, Duff argued that the information economic element was not fully supported by a strong evidence and Bell overly emphasized upon the theoretical knowledge. Overall, Bell explained the information society from social, political and cultural perspective, missing the most important element that is economy. Martin also attempted to explore the information society by proposing a new definition, he defined it as:

"A society in which quality of life and prospects of social change and economic development is dependent upon exploitation of information." (Nagaraj, 1998.p85).

Martin (1985 & 1995) divided, it into five outlooks: social, economic, cultural, technological and political. From an economic perspective, information is seen to be an asset. A more comprehensive definition has been proposed by Webster (2006), where the author argued that there are various ways to identify an information society, six to be exact, and five of those tend to measure the increase or the improvement of the following factors as evidence of the emergence of an information society: technological

development, advances in the overall country, improvement in workforce occupation, economic prosperity, amount of information in circulation and the more extensive use of symbols and signs. These five ways may be the easiest and most frequently used to measure an information society, they are also the most obvious ways. The sixth way is not measured like previous factors; it identifies an information society by looking at the changes in the way people go through life.

Smythe (1985) argued that, in the United States, the information technology industry only makes the poor poorer and the producer of information richer thus widening the income gap. In addition, information technology has a significant effect on unemployment rates, especially in developing countries, where the workers are unskilled and replaced by computers and new technologies in factories (Salvaggio, 2013). According to Martin (2005), information with emerging or communication technology in developed countries has become a strategic resource, as important as other resources. Moreover, the information sector has become a major source of national income, employment and structural transformation through the buying and selling of information and the new technology industry that provides such information, like software programs, smart phones and computers. Electronic businesses are changing the whole idea of business today; users can order any kinds of product or information materials, such as books, from anywhere in the world. In addition, the information society is creating new types of job, such as information management, as well as new kinds of organization, such as information banks, and new kinds of business, such as information marketing.

1.3.2 Viewing information society from a technological, social and cultural perspective

From a technological viewpoint, there is a strong link between the growth of information and its processing. For example, because of the Internet, personal computers (PCs) and other kinds of communication approach, the way to store, analyses, deliver and access information has changed greatly. In fact, technology plays a fundamental and most effective role in an information society (Jakobs, 2007). Moreover, some authors, such as Lyon (1988) have argued that, without technology, there would be no information society.

Lyon pointed out that the computer plays a significant role in such a society. Nonetheless, the role of the Internet in the information society is hard to explain without emphasizing the highly significant role that it plays. By using the Internet, people can easily share information between themselves. A study by Oxford University, which suggested that the Liberal Democrats Party would have been the winner in the 2010 UK general elections, if the results of the electorate through the Internet are taken into consideration, is a good example.

In addition, from a social perspective, society has changed because of the use of information and ICT; moreover, in developed countries, information technology will lead to a change in the social structure as a whole. In fact, in these countries, society consists of those with a wealth of information and the people who experience 'information poverty': those who cannot access information because they do not have the skills to use the new technology (Mansell and Steinmueller, 2002).

From cultural perspective, it may be that the most important concept of the information society is always given the least attention. It is obvious that the circulation of information drastically increases in the society. Devices like the television and radios have spread drastically and have become a necessity in our everyday lives. Television and radio broadcasts are running all day long; they have become portable and can be accessed anywhere at any time.

Books that play a vital role in the spread of information have also played their fair share in the circulation of social information; you can now find numerous numbers of books on different genres. Music, poetry and many other forms of art are now easily accessed by the general public (Webster, 2006).

1.3.3 Saudi Arabia's cultural, political, and social barriers regarding the transformation into an information society

There are a few obstacles that may prevent Saudi Arabia from being an integrated information society. If we compare the Emirates and British societies which will be comparisons later in this thesis to Saudi society, regarding to the Saudi society, it may be found that Saudi Arabia has different features from those societies. Clearly, the UAE

community shares some characteristics with Saudi society; however, they differ from each other. Therefore, we concentrate here on the cultural, political, and social barriers to Saudi Arabia's improvement as an Information Society.

1- Cultural Barriers

According Alkahtani, Dawson, and Lock, (2013, p.20) Culture is "a structure of ethics, values, and norms that are shared between groups of people.". As for Sarat (2019) defines culture as "what people have, think and do in their community, we can conclude that culture represents the mixture of people's saying, and how they are making their food and costumes, art, literature, attitudes, feelings, and values. In other words, culture is adopted, obtained, and transported from generation to generation. Culture is the characteristics and knowledge of a particular group of people, encompassing language, religion, cuisine, social habits, music, and arts." (Sarat, 2019, p. 40).

When it comes to Culture, each country or society has its own Culture that distinguishes them from one another in terms of the way they live and work. The Culture of Saudi Arabia, for example, was highly influenced by Islam, the role of history, and its traditions, which makes it different from other cultures. Culture in Saudi Arabia has an impact on management styles, management decisions, and management behavior. It is essential to really understand the cultural and social differences in the Saudi community, such as language, text direction, gender communication and fear of losing face which can have substantial impacts on the transferring to an information society. (Alkhtani, Dawson and Lock, 2013).

2- Language Barriers

The Oxford Dictionary defines the word "barrier" as: "a circumstance or obstacle that keeps people or thing apart or prevents communication or progress.". Language barriers can result in communication issues. Also, the Arabic language is unique as it is not related to any other language and is very different from Western European languages such as English, which is used by most technology suppliers. So, that can cause communication issues. A language barrier between two cultures (Arabic and English, for example) also can be a cause of frustration and misinformation. The frustration we mean here is when two people from two different cultures or backgrounds, who speak

two different languages are not able to understand each other. In this case, a language barrier can occur, which will lead to creating an unfriendly atmosphere between the two communicating parties — another issue here which a preeminent issue is the issue of translation. When a specific language is not translated accurately, this can give misinformation due to the word to word translations that come from dictionaries or online language programs (such as Google Translator or any other websites that provide online translator). The significant problem here also is particularly bad for IT security as nearly all IT suppliers are English speaking, and the IT code comments, documentation and help systems are therefore also often presented in English. Even if the translation is provided in Arabic, the differences in the language mean that the translation may not reflect the exact meaning provided in the original text. Legal translation services is a good example. If interpretations of manuals and instructions, or international conferences are not translated accurately, or if the translator failed to provide an equivalent in an Arabic/English, this will cause a massive misunderstanding between the two communicating parties. (Alkhtani, Dawson and Lock, 2013).

3- Text direction

Bi-Directional Languages include Arabic, Hebrew, Farsi, and more. While most of the world's writing systems start at left and move to the right. However, there are some other languages such as Arabic and Hebrew, which start at the right and move to the left. Most of the software products are written in the English language.so in order to reach the Arabic speaking market it must translated into the Arabic language. The process of translating a product, content, or application from one language to another is an Arabic localization which requires thoughtful resourceful planning when it's conducted the first time. Overall, this method will be difficult to grasp because of linguistic differences. Arabic character considered a sensitive language as it demands to leave, Date, number, and currency, and translating from Latin alphabet-based languages to BiDi languages such as the Arabic language is quite challenging. The Arabic language uses Hindi numbers. As numbers are laid from left to right in all BiDi languages. Therefore, the physical display of the text in Arabic will be a combination of the right to left order for characters and left to right order for numbers and dates, whereas Latin alphabet-based languages character and numbers are both shown in a consistent, left to right order." (Jandt, 2010, p.113). Educational Software (which were translated from other languages

into Arabic) sometimes they lack a professional and accurate translation that reflects the exact meaning in the original text. For instance, most of the software such as Microsoft Office and Banner in university operate in English, and the fact they are not provided in Arabic makes it a lot harder for students to accomplish their objectives. Also, some university information system programs that are translated into Arabic; they still face significant issues because of the differences in the order of the texts. For instance, in English, names usually start with the last name, then the first name and any middle name, while in Arabic, a list of students' names starts with the first name, then the middle name and the last name. Also, most applications used in university that are translated in Arabic, present the Arabic list a list of students' names starts with the first name, then the middle name and the last name. Also, most applications used in university that are translated in Arabic, present the Arabic list of students in English order which is very confusing for students (Alkhtani, Dawson and Lock, 2013).

4- Social Barriers: Gender Communication

Based on the teachings of Islam in Saudi Arabia, gender segregation in the workplace is of great importance to Saudi society, meaning that both males and females who are not family members cannot contact each other directly. Women in Saudi Arabia can work in male/female companies, but they are not allowed to interact or contact with male employees who work in the same workplace. Most women in Saudi Arabia work in shops allocated to women's products. In Saudi Women tend to work in separate section. For example, women's sections of universities, banks catering for female clients, social work and improvement programs for women, medicine and nursing for women, television and radio programming, and computer and library work. For these institutions, such segregation does have an impact on the efficiency of service provisioning, if only through the duplication of services for differing genders. For example, although Princess Norah Bent Abdulrahman University is a public women's university, some of its administrative employees are males. Because of the non-communication culture, some women employees find it very hard and embarrassing to communicate and deal with men. For women employees, the only way of communication with other male employees is carried out either online, via email or land lines phones and mobiles. Due to the nature of culture in Saudi Arabia, direct communication is not allowed, not by the PNU management, but by the female's husbands. This lack of contact between female staff and male staff who

control the information systems at PNU is jeopardize the security of the information held. (Alkhtani, Dawson and Lock 2013).

5- Fear of losing face

In Saudi Arabia, it is the culture to avoid any confrontation and conflict. Also, Dignity and respect are qualities that play a critical factor in the Saudi community. Dignity and respect in Saudi Arabia are represented in the way of saving face which is done using compromise, patience, and self-control. Arabian culture uses the concept of face to solve struggles and to avoid embarrassing or discomforting others. Moreover, when it comes to the business context in Saudi Arabia, the process of avoiding loss of face is essential. Saving face is of greater importance than putting pressure to meet deadlines or enhance productivity. It is very significant for any administration to show gratitude of

subordinates for their positive participation. It is impolite for administrators not being able to show their recognition continually to subordinates. Sadly, the fear of losing face mean that Saudis often exhibit:

1- Failing to accept criticism.

2- Failing to acknowledge the possibility that anything may be wrong to a certain extent. These inabilities indicate that any issues tend to be avoided as to acknowledge to any vulnerability would as mount to accepting criticism and losing fac. (Alkahtani, Dawson and Lock, 2013).

6- Political Barriers

According to the viewpoint of this thesis, being an information society means the freedom to get access to any kind of information at any time and whenever the user wants. However, in Saudi Arabia, this is not the case because the government supervises the Internet and blocks access to many websites for different reasons, political, social, and religious. For instance, as can be seen in the image below, the government blocked access to one of the movies websites, and when a user tries to get access to a blocked website, the following image would appear:
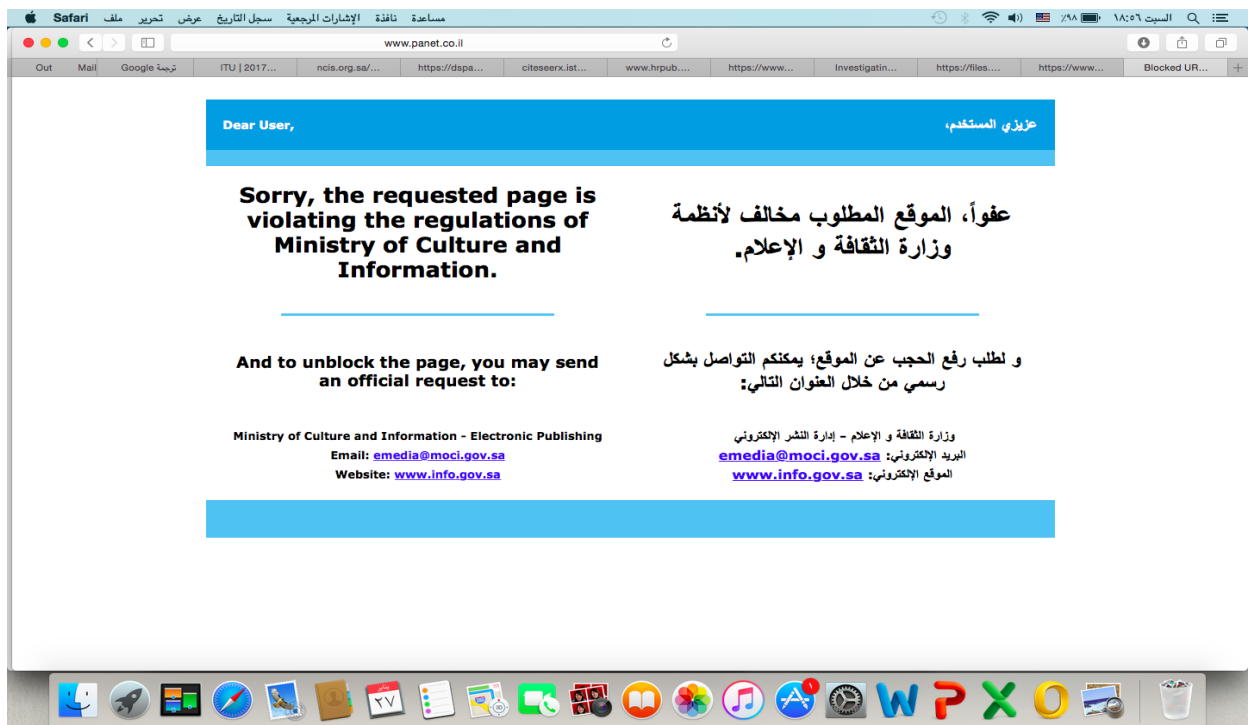
Figure 1: The webpage is not available in Saudi search engine.

Now, whether or not the government or public acknowledge that those barriers prevent Saudi Arabia from becoming a complete information society, the aim of this study is not to confirm or deny the status of Saudi Arabia as an information society, but rather the primary purpose is measuring the progress of Saudi Arabia towards becoming an information society.

1.3.4 Information Society Characteristics

Lyon (1988) highlighted that, there are some characteristics that define the information society. Firstly, information becomes an economic tool, as it can be bought or sold, and that leads to a change in the role of information. Secondly, there is an increase in the number of users. In modern society, people, as a part of their daily routine, search for information and there are connections between the amount of information available and user consumption. Thirdly, an information society is evidenced by improvements in technology and in communication sectors. Finally, information services, such as online searches and phone services, have changed. People today can access and find the information they are looking for even if that information is located in other content media or other sectors.

Above all, there is a very important feature of information revaluation which refers to non-stop revaluation for several reasons (Salvaggio, 1989). First, the amount of information, according to Mansell (2009), the amount of information has increased dramatically as a result of new technology. in fact, the information itself is not a new trend as there has always been information. However, what is new is the way of providing and reach the information. Secondly, the means of access to information has changed as a person can find any information he seeks. Which is free of charge and under the user's control. (Martin, 2005). Additionally, such access is cheaper than before, which allows all classes in society to use it. (Webster, 2006). On the other hand, the barriers are cancelled between people which is a negative point in the Islamic world. However, as it has an impact on globalization, the whole world becomes like a small village (Castells, 2007). Finally, the power of information has become very effective today. Moreover, today the right of information at the right time, using the right type of media could change many things and, in fact, a small piece of information could have a significant effect on the public. For example, President Barack Obama chose the best time to announce the news of Osama bin Laden's assassination and by national TV to announce it. It remained in American citizens' minds for the next American election in 2012 and it helped him win the election (Akram, 2012).

1.4 Research Aim and Objectives

The overall aim of the study is to explore and measure the current state of Saudi Arabia as an information society. Various sources such as (Al-Shehry and Drew, 2010; Alkahtani, Dawson and Lock, 2013; Mahana, 2017) have reported that the Saudi society is gradually transforming to become an advanced information society. This doctoral research examines the current situation from several perspectives. To accomplish this aim, the study has designed various objectives:

The objectives of this thesis can be summarized as follows:

- To measure the Saudi as information society in specific sectors (health and education)
- To measure the willingness of Saudi people in using new technology.
- To compare the Saudi society with other societies (UK and UAE).
- To provide a general method that can be used to measure the inclination and progress of any country towards becoming an information society

1.5 Research Questions

Following from these objectives, the specific research questions are formulated as:

RQ1: What are the possible advantages and disadvantages of turning Saudi society into an information society?

RQ2: What are the major obstacles preventing Saudi Arabia to become as an advance information society?

RQ3: Which Indicators can best be used to measure ICT infrastructure?

RQ4: Which indicators best be used to measure ICT use?

RQ5: Which indicators do/can be used to measure the ICT skills?

1.6 Scope

As noted above, the study is carried out in specific sectors of Saudi society, as examples of the development of an information society generally. The sectors chosen are education and healthcare. There can no doubt about the important role of the educational and health sectors in society generally, and hence in an information society. They are important sectors in every country, requiring use of latest technology and equipment, including information technologies and systems. Various previous studies (Mansell, 2001; Hajela, 2010; Kling and Berleur, 2007) have assessed, these sectors to measure the progression towards information society. This point is discussed in detail in the following chapter.

This study will focus on the educational and health sectors in three different countries: Saudi Arabia, the United Arab Emirates and the United Kingdom, focusing in each case on the largest cities: Jeddah, Riyadh, Tabuk and Dammam (Saudi); Dubai (UAE); London (United Kingdom). The reason behind choosing these cities is that they are the largest cities and most vivid reflectors of society's progress.

A study such as this, carried out over a relatively short period of time, can only be a 'snapshot' of the progress of any country towards becoming an information society.

However, the methods developed for this study, if repeated at intervals, could establish an objective timeline of development of information society.

1.7 Measures of Saudi Arabia and other countries as information societies

This part of the study discussed the situation of the countries of Saudi Arabia, UAE, and the United Kingdom and the approaches to measuring the development of information society in these countries. The researcher examined the methods used to measure the information society in the countries mentioned in the study and found that these countries use the international reports as a reference to measure progress the state as an information society. In addition to international reports, each country has some specific indicators to measure the state's role in transforming an information society.

First: Saudi Arabia National Communications and information Technology Plan:

The National Communications and information Technology plan contain "a long-term vision, and a first five-year plan for Information and Communications Technology in Saudi Arabia (Mcit.gov.sa, 2015, p.5). "This vision is centered on transforming Saudi Arabia into an information society, to increase effectiveness and efficiency, and provide e-services for all sectors of the Saudi community and establish a powerful ICT industry in order to be a main and an essential source of profit for the country.". The aim is to access ICT services easily and efficiently. There are also other aims such as establishing job opportunities, enhancing the education quality and training through ICT in addition to the preparation of trained and experienced manpower. The five-year plan contains projects that cover the prime aspects of ICT usage such as e- Government, e-Commerce, tele-work, telemedicine, e-learning, digital Arabic and Islamic/cultural content. They also cover the regulatory activities such as issuing licenses for new voice and data operators and regulating the ICT market. The range also includes elements of the ICT industry, such as the identification of investment opportunities, research, improvement, innovation and international cooperation and transfer of technology.

Initiatives of Information and Communications Technology

The Kingdom of Saudi Arabia is pursuing a number of ICT initiatives to accelerate the community access to various services.

Home PC Program

According to the Yesser site, this program is a partnership between the public and private sectors and aims primarily to provide 1 million computers to Saudi houses within 4-5 years from2015. The main objective of this Initiative is to help Saudi citizens to acquire sophisticated computers cheaply through monthly installment of $27. The package includes a set of desktop applications, free monthly internet service, training, and a wide range of Arab and Islamic digital literature. Additionally, the initiative aims to increase both the computer and the spread of the internet across a wide sector of the Saudi community, particularly students.

Easy Net

According to the information provided on the Yesser site, Easy Net was provided for the purpose of reducing Internet access barriers, activate its' usage and penetration in the country. This can be accomplished by reducing access cost, to the cost of a local call, as well as eliminating the need for separate subscriptions in the Internet. Users can obtain access to the Internet through numbers of Easy Net access to one invoice with fixed-line fee. There's an estimate increase of 11% in the use of the Internet during the last six months, the transformation of the model of Easy net.

E-Government

According to the information provided on the Yesser site. A joint e-Government National Program was launched in early 2005 under the name of Yesser, an Arabic word meaning "Simplify". (Ministry of communication and information technology, 2005). Basically, this website facilitates the implementation of e-Government in the public sector. The main aim of this website is to raise the effectiveness of the public sector and to provide better and faster government services, and to ensure the availability of the required information in an accurate and timely manner. The main vision of the website is that by the end of 2020, every internet user in Saudi Arabia will be able to enjoy world class government services offered in a seamless, user friendly and secure way by utilising a variety of

electronic means. Various governmental institutions have carried out a number of e-Government projects or were under improvement. Examples include: e-government portal, e-government network, public key infrastructure (PKI), the e-government interoperability framework, national smart ID cards, e- Payment gateway (Sadad), e-Tax system, Social Insurance System, and electronic information exchange. There are a number of governmental services currently available on-line, such as the investment license, and applications for visas, traffic tickets enquiry and payment, paying passport fees, and paying utilities bill.

E-Award

An annual competition (GOV Awards Saudi Arabia, e-award), start in (2016) is held to promote local initiatives, innovation, contributions to of e-services and applications.

E-Services and E-Banking

Saudi Payment Network was one of the first interbank retail payment networks around the world. SPAN which entered the service in 1990 is a national network comprising thousands of ATMs and point of sale (POS) terminals. Other electronic banking systems include SARIE (Saudi Arabian Riyal Interbank Express – for electronic fund transfer), Tadawul (securities trading) (Semah) the National Credit Bureau (NCB) and e-banking services provided by most Saudi banks (telephone banking, electronic trading). This information is taken from the Yesser site.

E-commerce

According to the information provided on the Yesser site, the main infrastructure of E-commerce applications either has been developed or in the last phase of improvement. This includes:

• Legal elements. The Electronic Transactions and Cybercrime Act is currently being approved.
• The e-payment gateway "Sadad" is functional.
• The public key infrastructure (PKI) is under improvement.
• The postal services are under major enhancement.
• Assuring information security and privacy.

The main E-commerce applications have been improved and executed. For example, the electronic procurement systems in large companies (such as Saudi ARAMCO and SABIC), e-Umrah system (for travel packages for religious tourism by linking the international travel agents, the local suppliers and the related government entities), and e-Trade system that supports import/export processes by linking various stakeholders (e.g. Customs, Ports, and agents).

E-Education

According to the information provided on the Yesser site, the Ministry of Education is focusing on strengthening public educational environments by strengthening the Curriculum, preparing teachers, developing the abilities and skills of students in dealing with ICTs, and establishing computer clubs in schools. Universities and middle schools are increasingly adopting the concept of e-learning.

E-Health

Currently, the hospital management information system is carried out in over 200 hospitals and clinics throughout the Kingdom of Saudi Arabia. Telemedicine has been successfully used in King Faisal Specialist Hospital as well as a range of military hospitals. There are 19 hospitals and clinics connected to voice and video conference services, as well as remote diagnosis. The system connects Saudi hospitals with medical institutions outside the Kingdom for lectures, video consultations, and live broadcast of operations. The Ministry of Health has also initiated a program which links 25 hospitals to major cities in an effort to increase telemedicine and infrastructure services as well as international access to these websites. This information is taken from the Yesser site.

54	Saudi Arabia	6.67	45	6.87	↓
55	Serbia	6.61	55	6.51	—
56	Chile	6.57	59	6.28	↑
57	Bahamas	6.51	58	6.29	↑
58	Romania	6.48	61	6.23	↑
59	Moldova	6.45	63	6.21	↑
60	Costa Rica	6.44	57	6.29	↓
61	Montenegro	6.44	56	6.30	↓
62	Oman	6.43	64	6.14	↑
63	Malaysia	6.38	62	6.22	↓
64	Lebanon	6.30	65	6.09	↑
65	Azerbaijan	6.20	60	6.25	↓
66	Brazil	6.12	67	5.89	↑

Figure2: Image from ITU official Website show Saudi ranking (Itu.int, 2017).

The report Shows Saudi Arabia's ranking (54) out of (176) for the rest of the member states, which is far from Britain and the Arab countries.

Second: The United Kingdom

UK ICT strategy fall into four part include

A report by the Cabinet office (2011) entitled UK government ICT Strategy. The report was the first report gives a detailed plan for the British Government regarding to Measuring the information society. However, in 2012 the UK government published other report entitled Government ICT Strategy - Strategic Implementation Plan. The

report provideed the full details about the strategy risk, progress and completion dates the (Cabinet Office, 2011).

Part 1 –Reducing waste and project failure, and stimulating economic growth:

The Government is obligated to develop the way it provides ICT enabled business change so that investments in Information and Communications Technology support business needs and deliver expected benefits. And in order for the government to accomplish this, it will need to adopt the appropriate approaches and policies and develop a skilled workforce in order to enhance and exploit its Information and Communications Technology. Through the reform of its approach in the field of information and communications technology, the Government will stimulate economic growth by establishing a more equitable and competitive market, with greater direct chances for small and medium-sized enterprises. This part was completed on March 2015. This information is taken from the Cabinet Office site.

Part 2 – Establishing a common Information and Communications Technology infrastructure:

According to the information provided on the Cabinet Office site. Government depends on the complicated and large-scale ICT infrastructure elements to implement its daily operations. Government sectors have worked independently to develop, purchase and manage their own ICT solutions. This has led to the existence of expensive infrastructure and fragmented information and communications technology often reiterates the solutions and impede the sharing and re-use of services. There is a need for a new approach to create the information and communications technology that would provide the modern public services that citizens and Companies expect.

As the claims of the Government of the United Kingdom, there is a significant need to develop different strategies and plan for information and communication technologies together. The United Kingdom indicated that the familiar standards of technology will make it possible to provide an open platform to support small-interoperable solutions. And through open access to the platforms, the government will be able to obtain direct solutions to small and medium-sized firms rather than to be mostly through the integration of systems, helping to create a more equitable and competitive ICT market.

The United Kingdom affirms that in order to link, mobilize and reduce costs in the public sector, the Government will continue to exploit mobile technologies, collaboration approaches, and videoconferencing and conferences. These technologies will provide the workforce in the public sector with the major approach they need in order to work flexibly, which at the same time will provide additional benefits for clients. Flexibility would simplify the rationalization of large and diversified real estate properties in the public sector, reduce travel costs and carbon footprint, and It will have a beneficial effect on productivity. The time plan for implementing this part is start in 2011 and end within 24 months the full results will be published (Cabinet Office, 2011).

Part 3 – Using ICT to enable and deliver change:

According to the information provided on the Cabinet Office site. Standardizing processes and the establishment of a transparent business models, the Government will create a common infrastructure and flexible information and communication technology. The platform of the information and communication technology will enable the delivery of open, diverse and responsive public services for all. It was completed April 2012.

Part 4 – The strengthening of governance:

The strategy will be presented through departments that will accept responsibility for procedures and parts of the ICT infrastructure model.

Here delivery activities are already aligned with their work. This form of devolved delivery will require new and robust governance.

The United Kingdom also published in 2017 "Information and Communication Technology (ICT) in the United Kingdom: Investment Opportunities" guidance.

The United Kingdom encourages domestic and foreign enterprises to invest in information and communications technology sector in the country. The company Says that it is "one of the largest ICT markets in the world. This information is taken from the Cabinet Office site.

The British government supports companies in these areas: software improvement

The Government of the United Kingdom develops programs for many applications, international companies provide funding for research and improvement. About 100,000 software company operating in the United Kingdom, including Microsoft, IBM and HP.it was completed October 2011. This information is taken from the Cabinet Office site.

Market of Mobile device:

The mobile phone market in the United Kingdom is considered to be the largest in Europe worth 14 billion pounds every year and 80 million mobile subscriptions. Companies constantly seek new opportunities to use mobile phone technology to improve the experiences of their clients. (Statista, 2018).

Cloud computing:

According to the information provided on the Cabinet Office site. It is expected that cloud computing market in the United Kingdom to reach 6.1 billion pounds by the year 2014, offering a great investment opportunity for companies in the information and communications technology sector.

The main reasons for companies that use cloud services in the United Kingdom, these reasons are as follow:
• Flexibility in meeting the requirements of business.
• Faster disaster recovery.
• Automate software updates.
• Increased cooperation between staff
• Reduce costs.
• Low Cost the use of cloud services.

In 2018 A report by Statista shows that the ranking of major countries according to their cloud computing policy environment in 2018. As of that time, UK ranked fourth when it comes to a cloud computing friendly policy environment. (Statista, 2018)

Data centers:

According to the information provided on the Cabinet Office site. There are opportunities throughout the supply chain data centers in the public and private sectors. In addition, the United Kingdom provides help for public and private enterprises to protect and secure data.

Cyber security:

In the United Kingdom from 2010 to 2017. The estimated cyber security market size of the total public sector in 2017 is 1,137 million British pounds (GBP). (Statista.2018).

The reason for this growth in this area is to increase awareness of the threats of electronic commerce and improvement services are more closely linked. over the next few years, the report expected that the security of the mobile phone is going to be one of the biggest markets with more people using mobile devices for mobile trade. It was completed April 2012. This information is taken from the Cabinet Office site.

Research and support networks:

According to the information provided on the Cabinet Office site. Seven main institutions and networks are studying the effectiveness of data centers, commercial computing systems and information technology in the public sector and opportunities as follows:
• Data Center specialist group of the British Computer Society. (Bcs.org, n.d.).
  https://www.bcs.org/category/18286
• The Green network. (Green Network UK, n.d.).
  https://www.greennetwork.co.uk/#home
• The dynamics of the data centers. (Datacenterdynamics.com, n.d.).
  https://www.datacenterdynamics.com
• Energy Services and Technology Association. (Estaenergy.org.uk, n.d.).
  https://estaenergy.org.uk

Locations

According to the information provided on the Cabinet Office site. There are various sites in all parts of the United Kingdom known as "the companies' zones" that provide incentives for investors to determine their whereabouts there, including:

• The tax reduction. (GOV.UK, n.d.)

• https://www.gov.uk/income-tax-rates

• Planning rules simpler. (GOV.UK, n.d.)

• https://www.gov.uk/planning-permission-england-wales

• The financial profits. (Ons.gov.uk, 2018)

• https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/bulletins/profitabilityofukcompanies/januarytomarch2018

C2-Information and communication infrastructure: an essential foundation for the information society:

The Ministry of Finance and the UK Ministry of Culture, Information and Sports published a policy paper entitled "Strategy of Digital communications Infrastructure" in March 2017. The British government's strategy for the future includes high demand for data capacity and market support to deliver better connectivity.

The strategy of the United Kingdom about the future of the information infrastructure and communications is that high-speed broadband at least 100 Mbps must become available to all the buildings in the United Kingdom. On the other hand, the United Kingdom has committed itself to ensuring the access of the population in the rural areas to broadband high-speed internet.

According to the British Government, more than 80% of British citizens have access to high-speed services of not less than 24 Mbps, with the provision of services to the 40,000 additional building every week. Also, 4G (4th Generation) spread very quickly throughout the United Kingdom. between 2004 and 2017, the average price of a broadband package decreased by 48%.

OFCOM (2017) reported that the UK has the highest e-commerce spending among major nations, where consumers spend annually nearly £ 2,000 on purchasing goods online.

There is an increasing demand for digital services and applications in the UK, which indicates that the UK needs infrastructure that is high capacity, reliable, resilient, secure, and affordable and fast.

The International Telecommunication Union reported that 96% of British citizens living in rural areas are covered by a 4G mobile cellular signal in 2017.

In 2018, the British government sought advice from academia, consumers, business institutions and industrial companies on Britain's future strategy in response to the growing demand for data capacity.

- Video services: the continued improvement of the quality of the nature of the services of the video with the adoption of the 4k and 8K services.
- Cloud Services, and applications and resources: Increased use of large and remote network service central groups, data storage, and online access to services and resources.
- Education: the accelerated use the cloud by demanding multi-user business quality connections to the fiber optic network.
- Intelligent Cities: infrastructure, local talents, society organizations and digital technologies collected to feed sustainable improvement, economic improvement, and presenting such an attractive environment.
- Big Data: new techniques and means to apply and utilize processing massive quantities of data in actual time. This information is taken from the Cabinet Office site.

Progress

The UK Government has already made good progress against the ICT Strategy actions: (Cabinet office, 2017, pp.7-8).

- "The Assets and Services Knowledgebase (previously referred to as the asset register) is in development and due for release in October 2012. The supplier is an

SME (Small and Medium-sized Enterprise), identified through the Contracts Finder service launched earlier this year (Action 1).

- The Government Procurement Service has been restructured to be leaner and more efficient, with a commitment to cost reductions in excess of 25% on spend on all common goods and services, including ICT, by March of 2013. It is currently drawing up Memoranda of Understanding with government departments (Action 2).

- An Open Source Implementation Group, System Integrator Forum and an online Government Open Solutions Forum (referred to in the Strategy as the Open Source Advisory Panel) have been established and have begun to break down the technical and cultural barriers that impede the usage of open source solutions across government (Action 4).

- Guidance on the presumption against government ICT projects valued at over £100m has been drafted and is due to be published imminently (Action 5).

- Baseline standards for the Public Services Network (PSN) have been delivered and the first PSN services are operational in Kent and Hampshire County Councils (Action 17).

- An informal consultation to crowd source feedback on Open Standards has taken place (Action 22).

- A Director of ICT Futures, Liam Maxwell, has been appointed and has begun work to horizon scan and improve capability to identify risks and exploit new technologies (Action 28).". This information is taken from the Cabinet Office site.

IDI 2017 Rank					▼
IDI 2017 Rank	Economy	IDI 2017 Value	IDI 2016 Rank	IDI 2016 Value	Rank Change
1	Iceland	8.98	2	8.78	⬆
2	Korea (Rep.)	8.85	1	8.80	⬇
3	Switzerland	8.74	4	8.66	⬆
4	Denmark	8.71	3	8.68	⬇
5	United Kingdom	8.65	5	8.53	▬
6	Hong Kong, China	8.61	6	8.47	▬

Figure 3: Image from ITU official Website show UK ranking (Itu.int, 2017).

The ITU results showed that the UK ranked fifth and this ranking fixed did not progress or lag.

Third: United Arab Emirates

United Arab Emirates: The UAE has a national plan for the transformation into an information society by the year of 2021, a range of indicators that are used to measure UAE society as an information society were provided by the UAE Government. The following table defines the most important terms used in assessing the indicators of the enablers of the M-Government:

Term	Definition/Description
Enabler entity	It is the federal entity assigned by the UAE Cabinet to manage the standards of government enablers approved for the strategic planning cycle 2014-2016.
mGovernment pillar	It is the third of government enablers' indicators for the strategic planning cycle 2014-2016, used to measure mGovernment enablers.
mGovernment enablers and indicators	They are strategic and operational indicators used to measure the maturity of electronic/mobile services of federal entities and their electronic presence. They include six indicators as follows: Percentage of electronic/mobile transformation of federal services Percentage of usage of government electronic/mobile services Percentage of customer satisfaction of electronic/mobile services Level of public awareness about electronic/mobile services Level of websites' compliance with quality standards Level of government service compliance with quality standards of electronic/mobile services Level of government entities compliance with integration/connectivity.
Scope of evaluation	It refers to official government electronic services and websites subject to evaluation under the approved indicators of the enablers of mGovernment for 2016.
mGovernment enablers team	The staff assigned by Telecommunications Regulatory Authority to monitor, measure and raise awareness amongst the federal entities about indicators of the enablers of mGovernment and provide them with consultancy in this regard
Evaluation Committee	A group of employees assigned by Telecommunications Regulatory Authority, in its capacity as the enabler of mGovernment for strategic planning cycle 2014-2016, who measure the level of commitment by the federal entities to apply the indicators of the enablers of mGovernment
Review team	A group of officers assigned by TRA, as enabling entity of the mGovernment aspects for strategic planning cycle 2014-2016, who review and verify the level of commitment of the federal entities to the application of the indicators of the enablers of mGovernment
Arbitration committee	A joint committee between TRA and Prime Minister's Office (PMO) in charge of reviewing and responding to the entities' complaints, based on the response of the review and evaluation team
Evaluation process	Measuring the level of federal entities commitment to apply the indicators of the mGovernment enablers
Evaluation period	The time spent to evaluate the federal entities' commitment to apply the indicators of the mGovernment enablers

Table 2: "Defines of the most important terms used in assessing the indicators of the enablers of the m-Government." (UEA Official petrol, 2018).

38	Greece	7.23	38	7.08	—
39	Qatar	7.21	36	7.12	↓
40	United Arab Emirates	7.21	34	7.18	↓
41	Lithuania	7.19	41	6.97	—
42	Uruguay	7.16	48	6.75	↑
43	Czech Republic	7.16	39	7.06	↓
44	Portugal	7.13	44	6.88	—
45	Russian Federation	7.07	43	6.91	↓
46	Slovakia	7.06	47	6.84	↑
47	Italy	7.04	46	6.84	↓
48	Hungary	6.93	49	6.74	↑
49	Poland	6.89	50	6.73	↑
50	Bulgaria	6.86	53	6.66	↑

Figure 4: "Image from ITU official Website show UAE ranking." (Itu.int, 2017).

The figure (4) above presented the UAE ranking to other countries based on the ITU report the UAE Ranked (40) this figure far from Britain but advanced for Arab countries.

Results show the big difference between the three countries in the ITU rankings.

1.8 Previous studies

The research covered an important area in the field of the information society, where it focused on measuring the information society by providing a new way to measure the information society. This involves measuring readiness, skills, uses, Impact, and outcome.

The extent of technological development and the extent of human capacity and willingness to use this development to transform the Kingdom into an information society. The researcher did not find any study measuring the information society in the same way as it is designed in this thesis.

This thesis takes a different approach to the previous studies that measure the information society after evaluating the studies related to measuring the information society, the researcher found that most of these studies are focused on measuring the E-government, the obstacles and the challenges that facing the Kingdom regarding to transferring to an information society, The researcher does not underestimate the importance of these studies, but suggest that there is no study which measures the Saudi society as an information society using the same approach as used in this thesis.

Below are the most significant of these studies and government reports.

1- A report by Ministry of Communication and Information Technology (Citc,2016) discusses the Ministry's plan to transform the Saudi society into an information society that will explain the obstacles and the challenges facing the Kingdom and propose solutions to these challenges. Perhaps because there is no governmental or non-governmental body interested in this type of measurement and state relies on reports issued by international organizations such as ITU report.

2- A study by Alkhtani, Dawson and Lock (2013, p18) deals with the impact of Saudis culture on the information security system. These researcher's claim that "culture has an extensive influence on both Saudi Arabian society and its business environment. Saudi Arabia has a collective group-oriented culture with close relationships between people. The Islamic religion is part of Saudi Arabian culture and it plays major roles in Saudis lives. Saudi Arabian cultural factors, including language barriers, hierarchy, gender communication, fear of losing face, nepotism and wealth, affect the performance of organizations and their security. This paper focuses on the impact of the environment and culture of Saudi Arabia on information security and makes some suggestions on how these problems may be overcome."

3- A study by Alshehri and Drew (2010) highlights the importance of the digital divide in the information society. The study also tackles a set of challenges facing Saudi Arabia

to the transformation of an information society only, focusing on e-government services by listing these obstacles and providing solutions to these obstacles.

4- Al-Shehry (2008) published a study about the E-Government and the important role of the E-Government in information society also the Internet service in Saudi. According to this study, E-Government is an instrument to transform Saudi society into an information society.

The approach of this research is different from the studies mentioned above, because it uses a systematic method of measuring the new digital services provided by the Saudi government, and the interaction of the government employees in various sectors with these services, with the aim of providing a new general approach to evaluating developing information society.

1.9 Summary

This study does not focus on whether or not the Saudi society is an information society because all reports reported by international institutions and national plans of Saudi Arabia indicate that the Kingdom is indeed heading toward becoming an informational society. The main objective of this study is therefore to investigate the current status of Saudi Arabia as an information society, by comparison with other societies at different stages of information society development. To do so, the research develops a general approach which could be used to assess the inclination and progress of any country towards becoming an information society. Also, to know the barriers that prevent the process of this transformation and to ultimately achieve this goal, which is to become an information society. It is important to note that the researcher must design indicators for measuring the level of services, technology, and measurement of specific ministries and departments, to provide a clear and full picture regarding the performance of the Saudi ministries in progress to become an information society.

The research covers a critical area in the field of the information society, where it focused on measuring the information society by providing a new way to evaluate the information society by measuring readiness, skills, uses, Impact, and outcome in the extent of technological development and the extent of human capacity and willingness to use this development.

It is necessary to clarify that the indicators used in this study are the indicators designed by Gardin (2002). These indicators can be used in whole or in part according to the data collected for them.

The indicators used in this study differ from the measurement indicators discussed in the chapter (3) as these indicators focus on measuring the readiness of countries in terms of technology, for example, measured the speed of intranet, the mobile phone services and the number of computers per person. While the indicators used in this research concentrates on measuring the performance of government institutions in term of technology and occupation. Overall, it is clear that the method of measurement used on the ITU report to measure the information society in the level of the data approaches and the area of measuring is distinctly different from the measurement used in this study, and hence this study provides a complementary viewpoint. Moreover, there is no similarity between the use of the measuring indicators used in this study and any other stud, whether local or international study.

In this chapter, the researcher introduced the context of the information society as a main indicator of the development of a country, noting different interpretations of the concept. The researcher approached this task by comparing interpretation of such a concept across time from significant contributors on the subject, starting with Bell in the 1970s, moving on to the interpretation from Martin in the 1990s and finally Webster who proposed a slightly different view from Martin during the same era. Information society characteristics were also explored and identified in detail to help the reader to gain a background on the subject. The aim of this research is to analyses the development of an information society in the educational and health sectors in Saudi Arabia, and the researcher has listed the main objectives that will help her reach this aim. This research will significantly contribute to the development of an information society because it focuses on two key sectors that determine the welfare of a country, making it the pioneer of such an approach in Saudi Arabia. The next chapter will present the literature review and will expand on the reasons for focusing on the educational and health sectors.

Chapter Two

Literature Review

2.1 Introduction

The researcher began with collecting data and sources about information societies in both western and Arabic sources. There are many studies and much research that addresses the measuring of information societies from different perspectives. The researcher searched for studies, articles and books in the King Abdul-Aziz University database and in the Saudi Online Digital Library, which include all research and studies about Saudi in the field of information societies or measurement of information societies.

The researcher used sources from the City, University of London database and used the university library to collect English sources for the research; also, the researcher used Google Scholar and also visited the British Library for additional sources. Also, the researcher used the Library and Information Science Abstracts (LISA) that included Arabic and English sources.

However, the aim of this chapter is to review the studies related to information societies and measuring an information society; however, none of these studies/books or articles discussed Saudi Arabia as an information society.

The researcher gathered information on the Saudi context from her previous studies in that country, and from current Saudi reference and media sources.

This chapter covers:

- 2.2 Search strategy.

- 2.3 Literature review on information societies.

- 2.3.1 Literature review on measuring an information society.

- 2.4 The importance of measuring an information society.

- 2.5 Saudi position as an information society.

- 2.5.1 A historical overview of Saudi as information society.

- 2.5.2 The Saudi Plan to Become an Information Society.

- 2.6 The role of higher education in the requirements of the information age.

- 2.7 Summary.

2.2 Search Strategy

The researcher used search terms such as 'information society', 'ICT indicators', 'measuring information society', to carry out the search in a variety of bibliographical sources, in both English and Arabic. This yielded a large amount of material, even when narrowed down to the Saudi Arabia context. However, none was directly related to the research topic which is measuring the information society in Saudi by using ICT indicators. All these publications were in English, even regarding Arabic data; there was no example of a relevant sources that would help gather useful information. The researcher believed that this might have been caused by a lack of Intellectual property rights in the Arab world (Abboud, 2018), which reduce the incentive to upload research data online. Therefore, the researcher used the database of King Abdelaziz University in Jeddah after taking permission to use from King Abdelaziz University. For the English resources, the researcher used City university databases and the university library, and some sources from the British Library. Regarding the international reports that were published online.

The researcher looked for resources such as books reports studies that related to information societies in general and measuring information societies specifically in this case the English resources were more fully descriptive than the Arabic resources. However, the researcher had to use Arabic sources just to have a background about the topic to compare the viewpoint with the western outlook, and the latest developments in measuring the information society for the Arab countries and the measurement of the information society. These sources unfortunately did not cover the measurement of the information society in a way that helped the researcher, as most of the Arab studies focused on e-government, and the remainder focused on the Internet speed or the quality of the services.

2.3 Information Society Literature Review

There are several studies, books and articles dealing with the information society in general and most of these references in English of course, because of the importance of this subject, the Arab references also dealt with it, but the general nature of the Arab references mostly take the ideas of English references, this does not diminish the value of Arab references, It is necessary to clarify this point because the subject of the study is to measure Saudi Arabia as an information society and therefore the Arab sources and references are supposed to be important in the study, but the lack of Arab sources and references, especially those focusing on Saudi Arabia Led to the researcher's focus on English references. However, most of the studies deal with the same topics of the information society as the Information Society history and the concept of the Information Society, but in the researcher point of view some of these sources are considered the pioneer in this field for example, Webster, Duff, Bawden, and Robinson.

In this section, the research had covered some of the references that dealt with the information society in both Arabic and English, as well as the references and sources that dealt with measuring the information society. Although there are many references and sources that dealt with the two topics, however, the researcher had focused on the references that benefited from it and its progress to achieve the desired outcome of the research. Webster explains (2006 and 2014) that there are six different definitions for the information society according to Webster. These are technological, economic, occupational, spatial, and cultural. Webster further describes the different information society perspectives and includes other researchers' points of view. Additionally, the book answers most of the questions that may be asked about the information society now, for example, how can we make sense of what is going on with our world? Where is it all taking us? Where do we fit in all of this? This is daunting and frequently bewildering. The researcher has enjoyed the presentation of information in these books, and this reference, in particular, has helped the researcher to understand the information society in a complete way.

On the other hand, the introduction to information science by Abd-alhadi (2015) is the most important source of information science in the Arabic language. The book includes the information theories, and the convergence of concepts related to the specialization

of library and information science, especially as it relates to the establishment of this science and its academic accreditation officially in the university institutions since 1989. In this subject, Dr. Abd-alhadi gives an explanation and a view in which the researcher fully shares the opinion "Information studies closer to studies of communication and social studies. With the increasing growth and vast diversity of human knowledge in a world whose pace is accelerating in a feverish race to take the lead in science and possess the keys to progress, the need for an exanimation of information science seems to be open to those interested to keep pace with the successive developments in information technology and stand To the latest of modern science and access to the future confident steps in a world that recognizes only the language of science and information, and the need in Arab world such a book, which came as a result of the efforts of The book is a methodological and in-depth study that is useful for researchers, scholars and all those interested in this field of thought, contemplation and action. No one in the Arab world wants to write a research on the information society or information science in general can write any research without reference to this book because it covers most topics related to the information science discipline.

We all the time hear that we are 'living in an information society' but what exactly does this claim mean, and how might it be verified? In an important methodological study, Alistair Duff (2013) presents the argument that there are several 'information society theses', each with its own disciplinary origin and tradition. One talks about an 'information economy'. Another about the Japanese theory of the 'information's society' which measures communication flows, while a third focuses on IT and the 'information revolution'. This book brings together the various schools and examines them systematically in a comparative setting. It represents one of the first in-depth treatments of the field as a whole. This work will be a key text as it discusses the concept of the information society in a profound and objective way by offering different models of information congregations as the information innovator in America and Japan through the background of the history of the information society, which presents the subject in a clear way. (Bawden, 2014).

In Martin's article (1988), he provided a general idea about what an information society is and the factors that help to change the society to become an information society. This article compares different opinions regarding to an information society. In addition to this, Martin's compares different opinions in regard to an informational society. This article was important and useful but not quite modern. Nonetheless, it is necessary as it shows the point of view of the concept of the information society in the Eighties and compares it with the modern perspective.

Matwly (2012) divided, the characteristics of the information society in three basic characteristics the use of information as an economic resource; the growing use of information among the general public and the emergence of the information sector as an important sector of the economy, Moreover ,in her opinion the most important component of the information society is the knowledge economy, which makes information and information technology an integral part of most social, economic and political events and achieves profound structural changes in all aspects of life. Also, she discusses the impact of the Saudi plans for the technology and communication sectors in order to transfer society into an information society. The author pointed out the importance of implementing these plans. The researcher believes that there is a clear benefit in this study.

Mansell (2009) gives, a clear view of an information society that starts with a full background about the topic and provides different definitions of the information society by different scientists from the beginning of its era up to the last century, including Webster, Catells and others. The book also discusses an idea of measuring the purpose of transforming a community to an information society This book focuses on several developments which rise from the growing use of communication technologies in the modern world in supporting the creation and exchange of knowledge.

Daniel Bell founded research on informational society when he wrote about 'The Information Age'. This as a result, has broadened the concept of Social Sciences. The new title in Routledge's Major Works series, Critical Concepts in Sociology, is a significant source in the literature of the field of Social Sciences (Mansell, 2009).

From the point of view of the researcher the book by Bawden and Robinson (2012) is considered one of the best references that provide a clear idea of the information society and discuss the most important topics related to this topic. The book provides important information about the most important books in this field, which gives readers a comprehensive idea and helps readers to know the different views related to information science as a whole and the information society in particular. The book in general is easy to understand and any readers can benefit from it.

A research study by Al Ali (2011) focused, on examining the Egyptian society and clarified the purpose of transferring to an information and knowledge society. The study analysed the factors that help the society to transfer into an information society and provided some recommendations that would help policy makers to improve the national plan in technology and information sectors this study focuses on the Egyptian society as an information society, although it is useful as an illustration of the information society as an example. However, the researcher disagrees with some of the results of the study. The study focused on the technological factor as the main and only factor of transformation as an information society. The researcher believes that the human factor is as important as the technological factor.

Nguyen and Jollès (2005) discussed, in their study whether the European society is an information society for all European state members, and the difficulties that the European commission faces in order to transform member states into information societies. This study discusses the European experience of transformation into an information society. Since the Saudi society faces different difficulties from the European community, this study is a general example that cannot be directly compared to the Saudi society as Saudi society is different from European societies in important respect.

Algohary (2013) claims, that there are many factors that affect Saudi Arabia in becoming an information society and she emphasises the role of higher education and the education systems in general. This study helped the researcher to know the role of education in Saudi Arabia and the obstacles facing education and its role in transforming Saudi Arabia into an information society. Some of these barriers are the lack of computer use in education and the lack of training for students to use technology. She also believes that the manpower in the information society and the new model of

management and team work and the transition from concentration and model and the transition from closure to openness and transition from the long cycle of production to the competitive acceleration are the most important factors to build information society.

In their study about building an information society, Mahan and Misnikov (2004) pointed out, in terms of information and communication technology, that there is no consistent definition or clear concept that suits all policies. The researcher through her study of this subject fully agrees with this opinion. However, they emphasised that most nations desire to benefit from the financial aftereffects of an information society by using current national endowments and resources. Success also depends on how well the new technology services can be absorbed by existing institutions and successfully installed throughout society. They argued that, in order to build an information society, even if it has a different starting point, there are still some common principles for successful national policy creation and programmes. However, they added that there are some basic points that any society must meet in order to make the transfer to an information society. These points include the employment of ICT instructors to teach skills and use, especially in education sectors. From the perspective of the researcher believes that the results of this study give a clear idea of the information society and how to build it.

Salam (2010) discusses, the chance that Saudi society will have if it becomes an information society; also, he discusses the obstacles that Saudi faces in the information sectors and how that affects Saudi Arabia in becoming an information society. For him

The characteristics of the information society have been identified in culture, education, scientific innovation, the Internet and knowledge as the most important sources of wealth and power in the information society, the use of information as goods and services.

2.3.1 Literature review on measuring an information society

This section includes studies and articles that discuss the progression and measurement of information society in different countries and from different point of views:

Ziemba and Zelazny (2013) they analyse, the ICT indicators that are used to

measure the information society in Poland. Firstly, it includes some definitions along with key links and strategic goals; in addition to that, it presents the information society projects applied in Poland .and this study helped the student to understand how the ICTs indicators can be used even it is used of this study.

Study by Zamberi and Khalizani (2017) focus, on the use of mobile government services in developing countries specifically UAE as it is considered one of the leading nations in the Arab World. It mainly focused on the cost, social influence, trust, social influence and demographics. As a result, the studies showed that trust and social influence were the most positively associated with the final users who would adopt the mobile government. This research adds to the increasing body of literature by testing the intentions of users to adopt m government. There are several practical and theoretical contributions that are offered by this study. In regards of the theoretical contributions, the tern model has been extended in this research and has portrayed how the improved model can predict m-government adoption in the UAE. Furthermore, this model can be used to propose new directions of M-government with future research agenda. This study is among the few studies that investigated m-government adoption in the UAE because the UAE is a fast-growing nation, but users still abide by their Arab traditional values and cultures. There are various aspects, including psychological and technological factors that make m-government adoptions complex. Thus, understanding these factors provides directions for similar results.

On the practical field, the government of UAE could use the strategies suggested from this study to boost users. Keeping in mind that the social and trust influence significantly relates the decision of UAE users to adopt M-government and they should emphasise towards the mentioned factors to attract more users.

There are several limitations to this study such as that this study is restricted to users in the UAE.

Agala, Ojo and Olugbara (2013) conducted, a study on analysing ICT indicators. The purpose of this study was to identify the limitation of these well-recognised indicators to try to edit and improve their efficiency and productivity. The study collected information through surveys. However, the writer claims that the best way to measure the information society is through measuring the behaviour of consumers and adopters.

Okuda (2009) shows, the progress achieved in some countries and assesses a sub-regional approach and how it can speed up the promotion of ICT indicators by sharing the spreading of knowledge, professionalism and previous experience. This paper shows how promising countries like Thailand, Malaysia and Singapore in help neighbouring ASEAN countries through cooperation mechanisms and structure and examines the case of ASEAN countries.

The Hong & Huang (2005) have evaluated, the progress of china as an information society. The study focused upon the internet cafes as central research point. The researchers mainly attempted to explore the distinguished sociological and political role of Chinese internet cafes in efforts towards becoming an information society. The study has also discussed the influence of internet cafes on the Chinese' democratization. The study discussed how the Chinese authorities are struggling to facilitate the transformation process while resisting the democratization. The case shares the similarity with the Saudi Arabian society. Based on data from multiple sources, research contended that there is a clear divide between authorities and public's concern with the influence of internet cafes and that is creating major hindrance in the development of China as an information society. While assessing the various dimensions of information societies.

Balkin (2004) argued, that advanced digital technologies are altering the social conditions of speech freedom. The scenario has redefined the theory of free speech from republican concern, protecting democratic liberation to the wider concern of promoting and protecting a democratic culture. Digital technologies are promoting a democratic culture that offers a fair opportunity to individuals to take an active and meaningful part in societal development while maintaining their separate identity. The study has proposed that Meiklejohn derived the influence from social conditions of free speech stimulated by mass media popularity in the 20th century.

Xanthidis & Nicholas (2004) conducted, detailed research on Greece to measure the progression of the country as an information society. The researchers highlighted various factors that carry a direct influence on ecommerce growth of Greece, including flexible legal frameworks, government incentives, advanced technologies available at reasonable prices and wider public acceptance of internet as medium for purchasing

goods. Information technology experts have recognized the importance of this factor and need to focus on them to facilitate the overall transformation. However, the analysts have also commented that further development is required to regard Greece as an information society as currently, the progress is not measurable. The research has provided meaningful insights to Greece policymakers governing ecommerce growth in the country.

While commenting on measuring the progress of a country as an information society.

Menou & Taylor (2006) have contended, that recent years have observed a proliferation of digital society and study of the metrics measuring an information society are not clear, have serious limitations and are irresponsive to the basic requirements of various stakeholders. The research highlighted eight areas that need to be taken into consideration while defining the information society metrics, including establishing measurements that have a strong theoretical foundation, clear measurement units, reliable sources of data, appropriate data analysis and indicators' construction, definite target audience and clear aim and usage of measurement. A collective and organized effort that could offer the stimulus for the advancement of a comprehensible study field is required to address the challenge of accurately measuring the development of an information society.

The purpose of this research is to identify the progression of information society in Saudi Arabia and discuss the government plan relating to IT investment and how that will affect the economy's ICT growth. The study provides some recommendations that will help the country in the IT investment sectors (Almalki, 2013).

In a study about ICT indicators to measure Algeria's information society, Alaloy (2006) provided, a range of questions that might help to address the obstacles that limit the country in terms of turning into an information society.

In conclusion, the literature review shows that there are several studies, articles and books that discuss the information society in general and measure the Information Society by using ICT indicators. Again, none of these covering the subject same as this study. Hence, there is a need for the research described in this thesis. The next section describes the Saudi context within which the research was conducted.

2.4 The Importance of Measuring the Information Society

According to the United Nations Conference on Trade and Development, (Unctad.org, 2008) ICT indicators are defined as statistical standards for measuring the information society. Moreover, the same report adds that by using ICT indicators countries can produce policies that will be most beneficial for the maximisation of the advantages that ICT can bring for the prosperity of their society.

This can happen only under the condition of having reliable data from the statistics. In fact, there have been several attempts to use false constructs, dimensions and indicators in order to measure the information society, namely ITU, OECD, UIS and other members of the WSIS partnership by international organisation. The primary function of these measuring approaches is to collect data from as many countries as possible to present a global perspective based on internationally comparable data (Ajala, Ojo and Olugbara, 2013).

According to Karvaics (2007)

1- Genuine ICT indicators help support policies to initiate the appropriate strategies to develop economic and social prosperity through the use of ICT.

2- The goal of the partnership is to develop international indicators to be reliably used in various regions to track the transformation of the information society in those areas.

3- The importance of producing core-indicators that can be used globally to help compare the development of information and communication technology in different regions is stressed, thus helping policy-makers to issue the most reliable strategies for long-term growth based on ICT factors.

2.5 Saudi position as an information society

Transforming into an information society has become one of the main priorities of Saudi policy-makers and, in order to achieve this goal, the government has set a national plan that includes all sectors of the society such as the education, health, employment, economic and e-government sectors. All these sectors reflect the development of the society (Mahana, 2017).

This section examined each of these sectors in detail, to understand the reason for choosing the educational and health sectors as the area of study. Existing literature has reported contradicted findings when Saudi Arabia is viewed as an information society. Even though the Saudi government is taking a keen interest in this regard and is spending heavily on the information and communication technology sector, China and Saudi Arabia are two nations particularly known for their highly restrictive internet policies (e.g. Hong & Huang, 2005; Fatani, 2011). Evidence of this fact is that the Saudi government allowed the public access to the internet in 1999. However, before making this decision, a controlled infrastructure was designed to pass the internet traffic through servers controlled by the government. Today, wireless access and public networks have expanded enormously because of the supportive attitude of government towards development of advanced communication technologies. However, the control and security measures have not been relaxed, embedded into the socio-political culture of Saudi Arabia (Fatani, 2011). Evaluating Saudi Arabia as an information society, it has been reported by multiple sources that the internet penetration in the nation has been growing very slowly when compared to advanced countries. In 2009, it was 39 percent, and there was only 1 percent increase next year. Interestingly, 60 percent of this population is reported to be less than 24 years old (Internet world stats, 2016). Only 29 percent of the Saudi internet users had active Facebook accounts by 2011. Moreover, 48 percent of Saudi internet users are young females under 25 years' age (Fatani, 2011). Interesting research was carried out by Al Lily (2015) evaluate, the quality of information exchanged in Saudi information society. A typical information society is built upon useful and meaningful information exchange. Unproductive use of advanced technologies cannot transform a country into a true information society. The researchers carried quantitative and qualitative study to assess how productive is the information exchange in Saudi society. Results indicated that huge amount of exchanged texts through communication devices were useless and the information was trivial. Stating differently, the easy usage of advanced communication devices causes users to overuse them only for communication purpose, having no interest in making any productive information exchange. The article highlighted that the Saudi information society is suffering from the thinness of information.

Nevertheless, a report by the Saudi Ministry of Communication and Information Technology (Mcit, 2015) highlighted all the procedures that have already taken place or are to take place in the next five years in order to help the transition into an advanced information society.

The report shows the sectors that the government invests in to help the whole of society to become an information society. The list below shows all sectors:

1- For the use of ICT technology in the health field, some hospitals such as, the defences hospital and the National Guard hospitals, automate various functions that relate to using ICTs in management and health systems; however, there are some weak points about them, for example, they lack the unified specification and integration between them. On the other hand, it should be mentioned that King Faisal Specialist Hospital and Research Centre has outweighed other health institutions in Arabia in the use of telemedicine early, since 1993.

2- In the field of recruitment, communications and information technology to provide a variety of services, the country is witnessing Kingdom-oriented teleworking in the press and publishing sectors and intellectual works and web design. It should be noted that the seventh Five-Year National Plan for Development reported the issue of telework, a kind of work which suits Muslim women and helps to take advantage of the potential of people with special needs.

3- The indications from the practice of telework in some countries around the world are that 43% of companies in Australia apply these kind of work methods. In Ireland the figure is 12% of employers, and 8% in Malaysia. In Canada, 11% of the 10 million workers work from their homes entirely, while the number of workers who work part time from their homes is about 40% (Marowits, 2016).

4- It is noticed that e-commerce has had limited use so far in Saudi Arabia, possibly due to the failure to complete all their infrastructure, and regulations and special provisions. A committee on e-commerce was chaired by the Ministry of Trade and Industry in 1998, which identified a number of tasks to be performed for the development of e-commerce (Algamdi, 1998). However, The Saudi Press Agency reported in 2016 that e-commerce was witnessing great growth, due to the availability of appropriate payment methods, improved means of shipping, and greater use of mobile phones and social media. According to the Saudi Communication and

Information Technology Commission report for the third quarter of 2016, e-commerce is an emerging industry in the Kingdom, and in line with the vision of the future. This web link provides reports and studies by Saudi Communications and Information Technology Commission for years (2013-14-15-16).

The assigned tasks of the committee currently known as the Standing Committee of electronic transactions have been handed to the Ministry of Communications and Information Technology, in addition to changing its name to the Standing Committee of electronic transactions. The advanced banking services offered by Saudi banks to their clients, should be noted, in addition to the work of major companies such as SABIC and Saudi Aramco.

In the context of the use of communication and information technology in the public sector, we find that the Kingdom took the initiative to enter information technology in various sectors a long time ago, but this early care did not live up to the desired level, and there are many obstacles, most notably the low representation of administrative communications and information technology. In most structures, the various public sector institutions have had poor strategic planning for communications and information technology for the most part and have not allocated a portion of their budgets for communications and information technology, which has weakened the training aspects of their employment. Added to that, most centres do not have administrative structures or procedural manuals for the implementation of the business (Mahana, 2017).

The need for coordination between governmental bodies with regard to cooperation and compliance with unified standard specifications is noted, thereby reducing redundancy and duplication in a lot of projects, and this in turn leads to significant savings in the budgets of government agencies. The recruitment procedures and financial incentives for staff communication and information technology in the public sector need to be updated to keep pace with modern developments in this area.

In the context of e-government, some government agencies in the Kingdom have sought to provide some of the services on their own or shared with others electronically. Examples of these bodies are the Ministries of the Interior, Foreign Affairs, and the pilgrimage, labour, and financial sections of the General Authority for Investment. Examples of services provided by the exchange of information are the issuing of visas

and paying of fees, and the provision of formal models. As SAMA for payment systems securely through electronic means, it releases the name 'payment' on this system.

The Ministry of Finance (PIF) has created the Saudi Project for exchanging information electronically (Saudi EDI) which initially focused on the international trade sector in terms of import and export services. The Ministry of the Interior has implemented the smart card project, which enables you to store personal information electronically, in addition to the ability to store digital certificates. The Ministry of Communications and Information Technology has created an 'e-Government Program' with the participation of the Ministry of Finance and the communications and information technology were launched officially in the fiscal year 2005, to be a joint program; it enables government agencies and encourages them to apply the concepts of e-government and methods, as well as the development of a national portal for government services, and work to create the infrastructure for e-government, and an operational plan in the Kingdom, and the development of common policies and standards for e-government projects.

In advanced societies, the term "information society" is very common as the developed societies like America and Europe have integrated the advanced technology into their culture's years ago. In a post-industry era, the "information society" has been regarded as an economical source that could be capitalized to stimulate the economic development of the state. Hence, the advanced states have embedded this conception and today found themselves in the context of a post information community. This global context is inducing the developing states like Saudi Arabia to take necessary steps for integrating the advanced technology and transforming into such information communities. Saudi society needs to establish the basic societal principles and prepare institutions and individuals to accept the societal shift, particularly the health and educational sector.

The Saudi government is required to craft a comprehensive national action plan in this regard, specifying and quantifying the clearly explicit goals. However, mere integration of a few information technology applications cannot enable any society to turn into a pure information society. In fact, it is a broad term that is used to represent an entire society, availing the transformational opportunity and integrating it into the roots of prevailing culture in a way that on a broader level, the transformation could be used as

a viable economic, strategic approach for policymakers. In other words, the information society in a contemporary era refers to a philosophical, economic and social system that raises the standards of living and communication within and outside the society. It ultimately results into a vivid betterment in the lives of societal members.

On the practical field, the government of UAE could use the strategies suggested from this study to boost users. Keeping in mind that the social and trust influence significantly relates the decision of UAE users to adopt m-government and they should emphasise towards the mentioned factors to attract more users.

There are several limitations to this study such as that this study is restricted to users in the UAE.

2.5.1 A historical overview of Saudi as information society

The pace of Saudi society towards an information society was set decades ago by Late King Abdul Aziz when the King set the foundation for PTT directorate in 1926. Later, in the same year, installation of 22 wireless stations was a major step that connected all towns and villages with telegraph services. However, during that era, the pace was slower than the advanced world regions, and up till 1934, only major cities of Saudi Arabia had the facility of manually operated telephones. Another major step taken by the Saudi government was the establishment of Saudi Ministry of Communication, followed by Ministry of Telephones, Telegraphs, and Posts, controlling telecommunication and post sector in 1975.

Between 1975 and 2003, the major transformations included the countrywide establishment of telecommunication complexes in 1984, introduction of mobile services in 1995, establishment of Saudi Telecom Company in 1998 and formation of Saudi Communication Commission in 2001. Later, the ministry was renamed as communication and information technology in 2003. It is clearly evident that under the Ministry of PTT, the transformation pace was slow but steady. Due to major transformations in the socio-cultural environment at a global scale, an abrupt upsurge in technological integration occurred that resulted into the reformation of Ministry of PTT as Ministry of Communication and information Technology. The initiative was a major step towards transforming Saudi Arabia into an information society. It also demonstrated

a clear interest of Saudi government in capitalizing on the benefits of advanced communication technology.

Current advancements made by Ministry of Communication and information Technology

The ministry of communication and information technology is taking various steps that can stimulate the pace towards an information society. It is focusing on ICTs sector development and expansion of it into the roots of Saudi culture. The efforts are being exerted to gain the economic benefit from such transformation in the form of increased efficiency, enhanced productivity and improved GDP of the country. Moreover, the ministry is also taking different initiatives to make aware the public about the importance of underlying transformation. The latest initiatives taken by the MCIT include drafting laws against the ascending cybercrimes that is the greatest disadvantage of an information society. The collaboration between the CITC and MCIT has been fruitful in this regard. The MCIT has also taken the initiative of launching an e-government program with the name "Yessir." The major aim of this program is to enable and encourage different state departments to adopt the latest technology by applying e-government transactions. Another major initiative is the development of Saudi Government e-portal that aims at enabling the expatriates and citizens in their dealings with public sectors, enhancing the transparency level. MCIT is also encouraging the partnership between the private and public sectors for IT projects' execution including easy usage of the directory. The Ministry has ensured active participation in different forums, conferences, and festivals with an underlying aim of raising awareness among expatriates and citizens in information technology field and show the initiatives towards e-government application in the country. In order to encourage the public, the Ministry has also organized the "Digital Excellence Award" to enrich the Arabic web content spread, encouraging individuals and private and public sectors to develop the websites and consequently stimulate the transformation. (Mcit, 2017).

2.5.2 The Saudi Plan to Become an Information Society

According to a report by the Ministry of Communication and Information Technology (Mcit, 2017). Information and new technology play a significant role in the modern society. Therefore, it has become important for any nations in the modern society to set

a national plan to transform into an information society. In order to transform Saudi into an information society, that require a significant effort from both government and individuals. Saudi plan consists of 98 sections; each section focuses on developing:

1- The extent of communications applications and information technology and services in the society.
2- The suitability of telecommunications infrastructure and information technology.

Today, Saudi Arabia is developing country and in order to become developed country Saudi government has set up different goals to achieve this transformation (Mcit,2016)., however, to make this happen Saudi government must focus on the information and technology sectors. For example, in (2011) King Abdullah opened the University of Technology, a huge budget has been set up to implement the project. In fact, the main purpose of this university is to create a stable environment for scientific research. To improve the level of scientific research in the Kingdom (Mcit, 2016).

A report by the Saudi Ministry of Foreign Affairs (2015) highlighted that the Saudi government has established an integrated national plan that includes the development of ICT sectors commensurate with the complexities and traditions of Saudi society. To achieve the objectives of the plan, Saudi government has set up a programme to increase the awareness about the role that information plays in the development and advancement of nations. The programme focus on manpower training on information applications such as e-commerce.

In order transfer the Saudi society into an information society it was crucial to initiate the "National Committee for the Information Society", as a necessity, for the Information for All program (IFAP) that has been adopted by the UNESCO in 2011 (Mcit,2016; Citc.gov.sa,2017).

Below is a list of aims for the national committee for information society goals.

1- To communicate with the programme Information, and to highlight the Kingdom's plans and efforts to shift towards an information society. Bring attention to the importance of the IFAP and its objectives.
2- Stimulate the private sector and civil society to provide the society and the transition to information in line with the plans in the IFAP.

3- Take advantage of regional and international cooperation through agreements and memorandums of understanding and other international cooperation programmes and regional interests with respect to the axis of the Committee.

4- Identifying of issues and priorities and building on the contemporary status of the Kingdom within the IFAP.

5- Coordination between the work of the Commission and relevant national plans. Participating in activities and meetings of the IFAP along with arranging.

6- Encouraging the provision of information and communication services for the achievement of the objectives of the IFAP.

7- Promotion of the efforts of government institutions and civil society to enable them to contribute effectively in the application of the concept of an information society.

8- Provided a technical support for national capacity-building and exchanging knowledge and experiences in information and communication filed.

9- Work with UNESCO on projects related to Information for All. Monitoring the implementation of tasks of the Committee through the concerned authorities (Mcit.gov.sa, 2017).

2.6 The Role of Higher Education in Meeting the Needs of the Information society

The world witnesses today a drastic and steady progression at all levels of society, with all evolved and evolving countries pursuing to their development goals and seeking provide better services at all levels. Universities play an important role, being a driving force of development, providing the highest level of education, and carrying out research and development. Universities, and other institutions of higher education, play an important role in the research and development system in any country looking to develop, which requires close cooperation between institutions. Everett (2012) argued that the universities around the world have always been respected institutions, but that must recognise the needs of different sectors of society. A role in the process of economic and social development is one of the basic functions of modern universities. This implies that the conditions are created for individuals and institutions to take advantage of all the material, human, scientific, and health potentials of the university,

and to develop the awareness and skills of individuals in all fields, so that they can engage in modern techniques and innovations.

2.7 Summary

This chapter has showed that there are no literature reviews in either Arabic or English that specifically focus on measuring the information society in Saudi by looking at the educational and health sectors. Thus, the researcher has exploited previous studies to aid her in formulating a background on the subject. This chapter also discusses the roles of the local universities in the transition to an information society along with the government's plans to do so. The Saudi position in all areas of information development, such as e-commerce and e-government, has been discussed in depth.

The importance of measuring an information society has been outlined to explain the significance of the research along with further explanation of the reason for choosing the health and educational sectors. The next chapter explains the ICT indicators and gives an overview of some of the most important international organisations related to ICT.

Chapter Three

ICTs Indicators

3.1 Introduction

This chapter includes a detailed overview of ICT indicators and different opinions from two ICT related to international organizations The International Telecommunication Union (ITU) and the Organization for Economic Cooperation and Development (OECD). Both are involved in measuring the information society. For this study, it is necessary to know how these organizations use the specific ICTs indicators specific (Readiness, Intensity, Usage and Impact) which will be used for this research. This comparison enabled the choice of a set of indicators for use in measuring development of information society.

3.2 ICT Indicators

ICT is the short term referring to information and communications technology. It is also used as an extended synonym for information technology (IT); however, this term is usually a more general term that stresses the role of unified communication and the integration of telecommunications. In other words, "ICT (information and communications technology - or technologies) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications." (Toluca, Sevrani and Gorica, 2015, p. XVII).

According to the European Commission, the importance of ICTs lies less in the technology itself than in its ability to create greater access to information and communication in communities with few services (DIGIT-ICT Conference, 2014).

Alaja, Ojo and Olugbara (2013) argued that 'Johoca Index' (1970) might be the first version of ICT indicators; these indicators are composed of four categories:
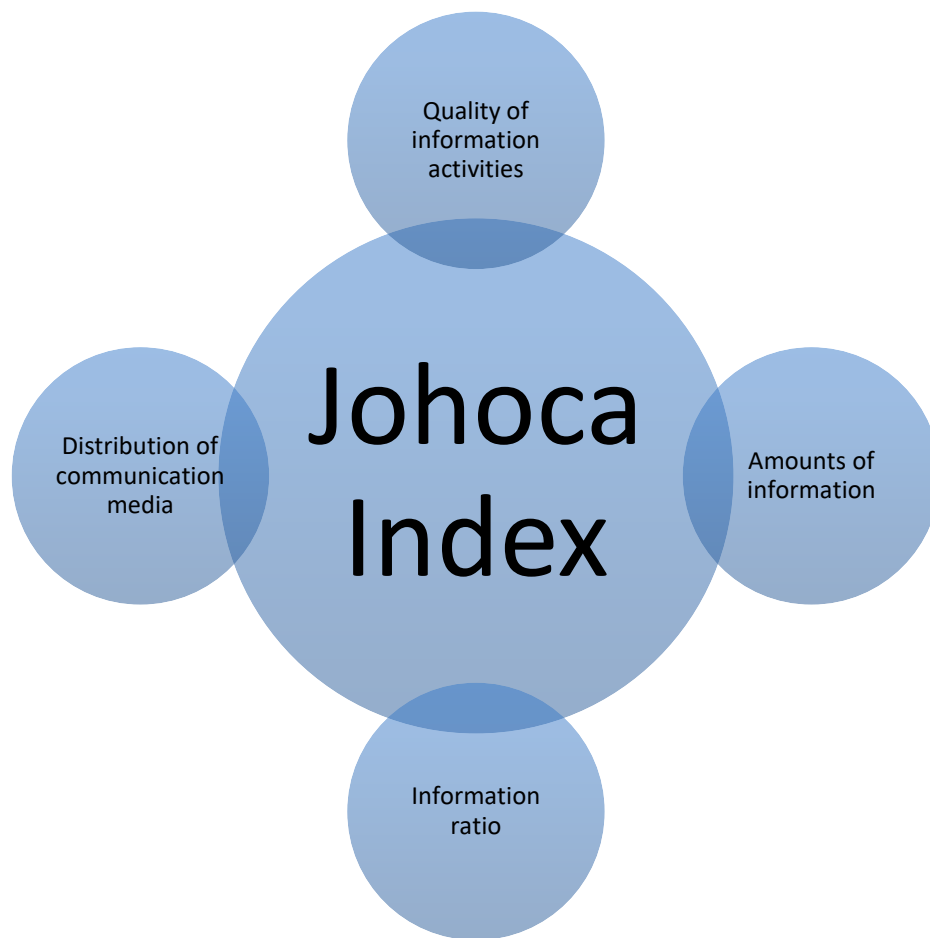
Figure5: Johoca Index for measuring an information society (Image by O. Alabdali).

- **Amount of information**: these are measurements to measure information density amongst the total population; such information activities are newspaper publication, publishing of books and telephone calls, divided by total population;
- **Distribution of communication media**: this is the abundance of channels to distribute information as telephone receivers or radio sets;
- **Quality of information activities**: this measures the proportion of technical expertise in the society to total population;
- **Information ratio of each country**: this is the ratio of expenditure on information to the ratio of total expenditure.

In 2003, a report by the World Summit on the Information Society (WSIS) which is a United Nations agency, pointed out that without ICT indicators, it would be impossible to identify if a shift to a more ICT-based society is actually happening. Moreover, the

reason for using these indicators depends on how developed the society is in relation to ICT (Okuda, Lee and Delmotte, 2009).

ICT indicator terms refer to "fixed telephone network, mobile cellular network, the Internet, fixed (wired) broadband, traffic, tariffs, quality of service, staff, revenue, investment, community access indicators." (ITU, 2010, p. 1). The UNCTAD report (2008) pointed out that by using ICT indicators, governments can measure the information society domestically.

In fact, Ajala, Ojo and Olugbara (2013); and Fuchs and Sandoval (2014) have argued, that in developing countries, it would be irrational to develop policies for future development without knowing the current state in which ICT is being approached. Indicators not only help identify the shift to a more ICT-based society, but also can help policy-makers to identify whether the investment and policies are having a positive effect on reaching goals and objectives.

Advanced countries also make use of indicators, but for different purposes, one of the reasons they are used is to try to improve existing policies but also to identify weaker areas that need stricter policies to be implemented.

ICT indicators can be used in all sectors of the society; however, this project will only focus on areas related to education and health as it would be impossible to measure the progress of Saudi in all areas.

According to Karvalics (2007), Gardin in (2002) was the first to provide a structure and analysis of what statistics and indicators are useful for underpinning, formulating, monitoring and assessing the ISCO that is an international nonprofit organization that handles Internet standards, education and policy development.

Gardin suggests hierarchy of complexity and classification of information society indices to allow for understanding of an ISCO. Gardin divided it into four categories as follows:

1- Readiness: indicators represent the basic set of requirements to support the building of the information society. They measure the readiness of the community itself to make such a move, as well as its ability to take advantage of information and

---

communication technology. That includes Core ICT indicators of ICT infrastructure and access.

2- Intensity: indicators of intensity of use describe the terms and goals used when this technique is used in various sectors, such as business and education. These indicators are essential in the information society and provide the basis for measuring the performance of a society as it builds the information society.

3- Impact: indicators are generally related to change at the organizational level.

4- Outcome: indicators are mainly related to the level of social and economic factors that describe economic growth, they are also used to measure the final result of what is happening at the level of production facilities in terms of productivity and social impact.
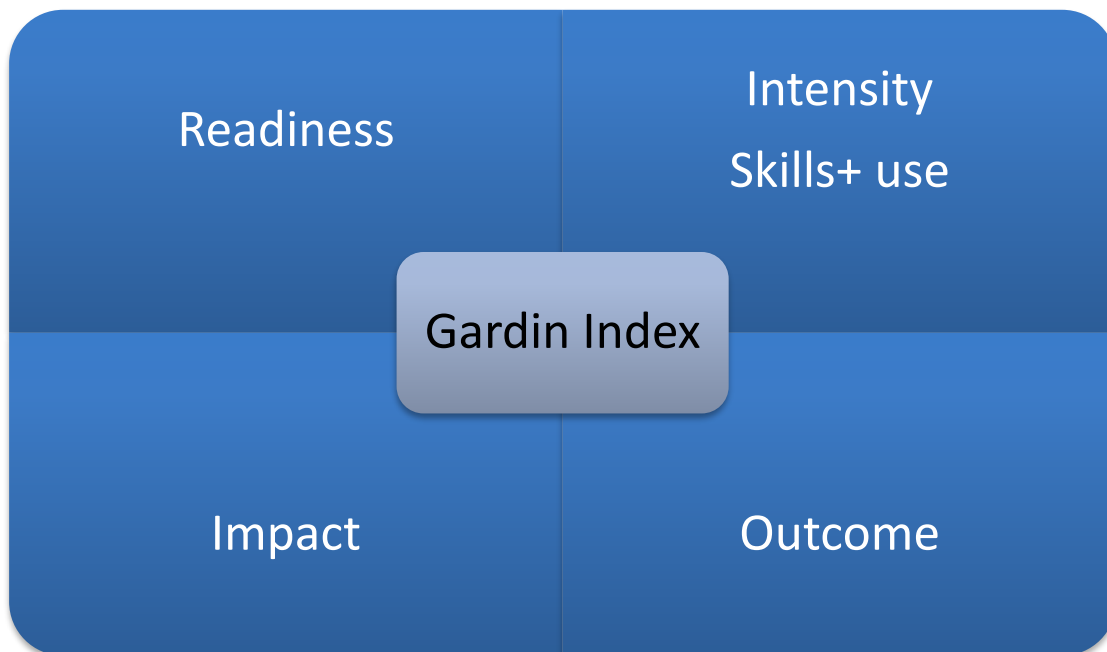
Figure 6: Gardin Index for measuring an information society (Image by O. Alabdali).

The researcher chose the Gardin Index for this study, instead of the Johoca Index for reasons to be mentioned in chapter (4).

On the other hand, there are some weaknesses that effect the ICT indicators.

Firstly, there is a lack of consensus operational definitions of the concept of information society; reliability of the indices and data used are not ensured and there is no

conceptual agreement on what to measure among all the models (Unstats.un.org, 2010).

Secondly, some indicators lose value due to the rapid development in technology and information societies (Algarafi, 2008).

Overall, the ICT sector can be measured with any of these indicators whether it is a readiness/enabling indicator, or as an indicator of intensity, or as an impact or outcome indicator (Unstats.un.org, 2010).

3.3 International Organisation for Measuring Information Societies

As a result of the breakthrough in ICT, the world has seen a new type of gap, the 'digital gap', or 'digital divide' which could lead to creating a new society divided into classes, with some people having access to ICT and others who do not obtain the resources. Recognizing these threats, it is important to deal with this issue as the highest priority. The United Nations, in 1998, proposed the idea of holding a summit; the idea came as a solution to prevent the 'digital gap' between countries and allow them to maximize the benefit from their technological development. In 2003, the WSIS was established, which is an initiative of the United Nations (UN), specialized agency on information societies.

The world summit is an event including all stakeholders like governments, international organizations, non-governmental organizations and civil society (Barnes, 2005). The world summit action plan paper (2005) pointed out that the purposes of this plan was to 'build an inclusive information society'. In addition, the plan provides a set of specific targets for building an information society, as appropriate, at the national level in the framework of national e-strategies and in accordance with national development policies, considering the different national circumstances.

These goals, standards and procedures are useful for assessing the progress made towards achieving the overall objectives of the information society. However, the plan shows that information societies reflect different levels of development and that these levels differ from one nation to another, according to the same action plan that affects development in different sectors (for example, technology, economics and other sectors in the society).

This thesis will discuss different guides that are used to measure an information Society, and which can be used for all countries: ITU, OECD and UIS. One of these guides is specifically created for measuring countries in western Asia, Arab countries (UNESCO), and may be used to measure steps to changed Arabia into an information society (WSIS, 2007).

3.4 Overview of WSIS

The first agency discussed in this report is WSIS. There were two information society conferences. The first was held in Geneva 2003 and then in Tunis 2005 (Internet Society, 2006).

The main reason behind the establishment of these summits was to bridge the gap between advanced countries and countries seeking to be advanced as information societies (WSIS, 2003). This was to be achieved by giving developing countries resources, such as Internet facilities, to help them ease their way towards becoming information societies and minimizing the 'global digital divide' between them and advanced countries.

Due to this, it became necessary to have a global ICT indicator as approach that could measure all societies equally and in the same manner. There was an establishment of agencies whose primary function are to impose objective indicators for measuring information societies (WSIS, 2005). The WSIS Forum meetings have been held in Geneva as follows: (WSIS, 2018).

1- WSIS Forum 2006: 9–19 May

2- WSIS Forum 2007: 14–25 May

3- WSIS Forum 2008: 13–23 May

4- WSIS Forum 2009: 18–22 May

5- WSIS Forum 2010: 10–14 May

6- WSIS Forum 2011: 16–20 May

7- WSIS Forum 2012: 14–18 May

8- WSIS Forum 2013: 13–17 May

9- WSIS+10 High Level Event: 9 to 12 June 2014

10- WSIS Forum 2015: 25–29 May 2015

11- WSIS Forum 2016, 2–6 May

12- WSIS Forum 2017, 12–16 June

13- WSIS Forum 2018, 19-23 March

14- WSIS Forum 2019, 8-12 April

3.4.1 The WSIS Objective

An action plan by WSIS (2005) showed different objectives to be achieved; all were concerned with the development of information societies by implementing ICT in developing countries and using these technologies.

The first objective, providing universal access to ICT that can expand information and communication technologies, and make it affordable and ubiquitous to include all the world's population. Also, helping those who benefit from information and communication technologies to use them effectively.

The second objective is to use information and communication technologies as approaches for economic and social development and to meet the Millennium Development goals for the development of information and communication technologies in order to develop economic, social and cultural rights; in addition, to create users that can adapt information and communication technologies to help promote the common goals of humanity. (WSIS, 2005).

The trust and confidence in the use of information and communication technologies. In fact, the benefits of information and communication technologies can be fully harnessed only with the confidence that these technologies and networks are safe, reliable and appropriately used.

Furthermore, there are some steps, suggested by World Summit on the Information Society (WSIS) that must be taken in order to build an information society with confidence and increased security:

- Information infrastructure, communications finance and investment, accessibility, development and sustainability are key factors in the building of an information society;
- Access to information and knowledge must be easy, affordable and secure;
- The role for governments, the business sector and civil society in the promotion of information and communication technologies for development should be more active;
- There should be aims to achieve capacity building by creating human resources development, education and training;
- Ensuring information security;
- Enabling the environment to access and use the information;

- Developing the technology applications of information and communication for all people;
- Establishing a cultural identity, linguistic diversity and local content, and media development;
- Identifying obstacles and overcoming them in order to achieve an information society that offers a humanitarian perspective.

An information society may be categories by five criteria of analysis, i.e., technological, economic, occupational, spatial, and cultural, which are used to define either information or information societies, and the ICTs indicators can predict a community's transformation into an information society (ITU, 2017). These standards have raised a lot of discussion and numerous inquiries. The existence of technology, technological spending or deployment of information technology and the amount and extent of the information provided are the indicators that can be used to measure an information society.

The telecommunications sector is of very high importance due to the role it plays in developing all countries. As a result of this, a partnership was created, and it consisted of international agencies for measuring ICT for development with the help of international organization, non-governmental agencies, private sector actors, civil

society organizations, regional and international organizations which are working together to build an information society where humans are the basic concern and to direct them towards growth and allow people, societies and nations to optimize the benefit from their resources and rise in order to improve living standards.

In conclusion, becoming an information society is a goal and a requirement for both advanced and developing countries, as noted in the previous examples. In order to meet these objectives, it was necessary to impose indicators to measure the advances happening in countries from the social and economic viewpoint. WSIS will help countries to overcome the limitations that they face related to the development of an information society regarding social and economic outlooks.

3.4.2 Partnership

"To meet the objectives of WSIS, it was necessary for international organisations to create a partnership as a primary goal, to provide countries with a set of statistical and analytical approaches that they may find useful to carry out their own assessment of ICT impact, with a view to supporting the formulation, evaluation and improvement of their ICT policies." This information is taken from the UNCATAD site at (www.unctad.info).

This had to be conducted with core-ICT indicators, to be able to view different statistical data from different countries and obtain a benchmark to compare the rate of progress towards becoming an ICT society and to show the 'digital divide'. ICT is believed to be one of the reasons behind economic development, and international investors would need data and statistics on the progress of a country towards becoming an ICT society to have the incentive to inject money into its economy.

As a response to WSIS, a partnership was established in 2005; it consisted of different organisations. In 2005, the Tunis Summit involved 11 international organisations: Eurostat, the International Telecommunication Union (ITU), the Organisation for Economic Cooperation and Development (OECD), the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the United Nations ICT Task Force, the five United Nations Regional Commissions and the World Bank. However, each member of the partnership has a different measurement; some organisations use guides, while

others use indexes and other different approaches to measure information societies.".
This information is taken from the UNCATAD site. (www.unctad.info).

3.4.3 The Main Objectives of the Partnership Follows:

Firstly: analyzing the availability of statistics information and communication technology to internationally compare and identify a common set of indicators for use in measuring the information society;

Secondly: helping developing economies to provide information and communication statistics by building and strengthening the capacity of the National Center for Statistics, as well as providing methodologies;

Finally: creating a global database of information and technology indicators.

On the other hand, the WSIS Partnership has established a number of task groups dedicated to:
- Firstly, capacity-building (led by UNCTAD).
- Secondly, impact (led by OECD).
- Thirdly, e-government (led by UNECA).
- Fourthly, WSIS targets (led by ITU).
- Next, education (led by UNESCO Institute for Statistics), ended in 2010.
- Finally, database development (led by the World Bank), ended in 2009.

This information is taken from the UNCATAD site.

The current core list of ICT indicators is composed of 50 indicators in the following areas: (WSIS, 2005).

a) ICT infrastructure and access (12 indicators)

b) ICT access and use by households and individuals (13 indicators)

c) ICT access and use by enterprises (12 indicators)

d) ICT sector and trade in ICT goods (4 indicators)

e) ICT in education (9 indicators)

According to the information provided on the UNCTAD site.

The Partnership recommends some actions that the countries should follow in order to improve ICT data availability:

To begin with, improving the level of information society statistics production based on the internationally agreed indicators and methodologies developed by the Partnership, in collaboration with relevant national stakeholders; also, including ICT statistics in national statistical strategies and master plans. This will accelerate the production of ICT statistics needed for a review of progress in the implementation of the WSIS was targeted by 2015. Next, enhancing local capacities on ICT statistics by making use of capacity-building and training approaches provided by the Partnership is important.

Additionally, use of harmonized - methodologies for ICT evaluation based on international standards developed by the Partnership to ensure international comparability of data must be used. Finally, collaborating with external partners, is necessary such as the contribution of non-members to the work of the task group on WSIS targets. In addition, ICT, as approach for development, cuts across many areas whose measurement needs to be further advanced, such as e-health, climate change or cyber-security, involving not only the Partnership, but also other organizations.

The above-proposed actions had provided countries with a set of statistical and analytical approaches that they founded useful for carrying out their own assessment of ICT impact, with a view to supporting the formulation, evaluation and improvement of their ICT policies. This information is taken from the UNCTAD report at http://www.unctad.info.

3.4.4 The Outcome

The points below will clearly explain the outcome of the partnership created at the WSIS summit:

• A number of global and regional indicators were developed by the partnership and made into the basic indicators for measuring the information and communications society (agreed upon by the participants in the meeting, 'Measuring the Information Society'), Geneva, February 2005.

- The product of extensive consultation with partnership-related national statistical devices was issued.

Definitions and models of questions and observations related to methodology and agreed-upon indicators were issued.

However, the current indicators list is not the final list; it is subject to periodic review and development, in response to changes in the information and technology sectors. Therefore, some indicators might be added or removed from the list. Moreover, the indicators list is not binding or mandatory; in fact, it is possible to use any of the indicators regarding the purpose of the research. Yet there are some obstacles that still exist; limitations that are still found are as follow:

1- Few countries collect data using survey through Statistics National Offices (NSO);
2- There is a lack of research about the information society in most countries, including Saudi Arabia;
3- Demographic indicators, especially those related to the population, are not updated and are conflicting;
4- Most countries collect (access indicators) only via telephone and Internet;
5- Few countries rely on the core indicators list of the Partnership;
6- Conflicts exist between agencies responsible for ICT statistics;
7- There are some different policies among countries regarding how the ICT indicators should be applied.

The above can be summarized as follows:

Firstly, all these projects arose in response to the recommendations of the WSIS, which met in Geneva in 2003 and Tunis in 2005. in Geneva (2003), the WSIS emphasized that the development of ICT indicators is important to measure the information society by measuring factors such as the digital divide and the ICT infrastructure.

Secondly, based on the WSIS recommendations, the international organization worked in a partnership that included OECD, ITU and UIS by UNSCWO and many other organizations.

Thirdly, in 2008, the UN recommended that the partnership continue to work with ICT measurement to track progress in the achievement of WSIS goals.

Therefore, all these organizations reacted to these recommendations on an annual basis in order to formulate a set of indicators capable of measuring the information society and monitoring the economic and social impact of the telecommunications sector and IT information-based lessons. Recommendations in this regard were issued to a number of international organizations, notably the ITU and the Economic and Social Commission for Western Asia (ESCWA), the World Bank, OECD and the United Nations Development Programmed (UNDP) (WSIS, 2005; Itu, 2015). This information is taken from the UNCTAD report at http://www.unctad.info.

3.5 Overview of the ITU Report

The ITU is one of the specialized agencies of the United Nations for ICT. It was established in Paris in 1865. Today the headquarters are located in Geneva. As the ITU is a member of the WSIS partnership, it is responsible for matters related to information and communication technologies; it consists of 176-member states and around 800 sector members and associates including Saudi Arabia. (ITU, 2017)

The ITU was the leading organizer agency in the information society world summit; its role in the partnership is to use ICT indicators related to measuring communication in the society. There was an annual report issued by ITU from 2005 to 2017, presenting the rankings of countries for turning into information societies by using ICT infrastructure, skills and use indicators; the report considered the gathering of data by the ITU team to be a basic limitation.

The latest report of ITU 2018 was not included as it was launched only during the 16th World Telecommunication/ICT Indicators Symposium (WTIS) the which will take place from 10 to 12 December 2018 in Geneva, Switzerland. The last report (2018) is also available   in two versions, but there are no significant changes from the 2017 version, but the second volume does not include a report on each country. Inundation the second volume consists of five short pages dealing with each of the four following topics;

1- The Current State of ICTs

2- ICT Skills for the Future

3- ICT Revenue and Investment Trends

4- ICT Price Trends

However, there are no major changes of the figures or statistic from the 2017 report.

The basic objective of the agency is to "build the framework of an all-inclusive and equitable information society' and find ways to use information and communication technologies to advance development goals, such as those contained in the Millennium Declaration." (ITU, 2013.p7).

According to the ITU report (ITU,2017, P.2) ''there are billions of mobile phone subscribers, close to five billion people with access to television, and tens of millions of new Internet users every year. Hundreds of millions of people around the world use satellite services – whether getting directions from a satellite navigation system, checking the weather forecast or watching television from isolated areas. Millions more use video compression every day in mobile phones, music players and cameras".

The report applies some standards that are used in the process of measuring the information society: the ICT Development Index (IDI) evaluates countries' performances relating to ICT infrastructure and uptake, including monitoring the most dynamic countries and ranking their achievements in ICT; data are collected relating to mobile services, such as the mobile prices in each country, for the purpose of discovering, for example, where mobile-broadband services are most affordable; a new model is created to measure the world's digital native population, for instance, learning about those countries with the highest proportion of young people who were born into the digital age.

It is important for countries seeking to become an information society to complete a quantitative overview of digital TV broadcasting trends in order to find out who leads, in terms of the growth in digital TV.
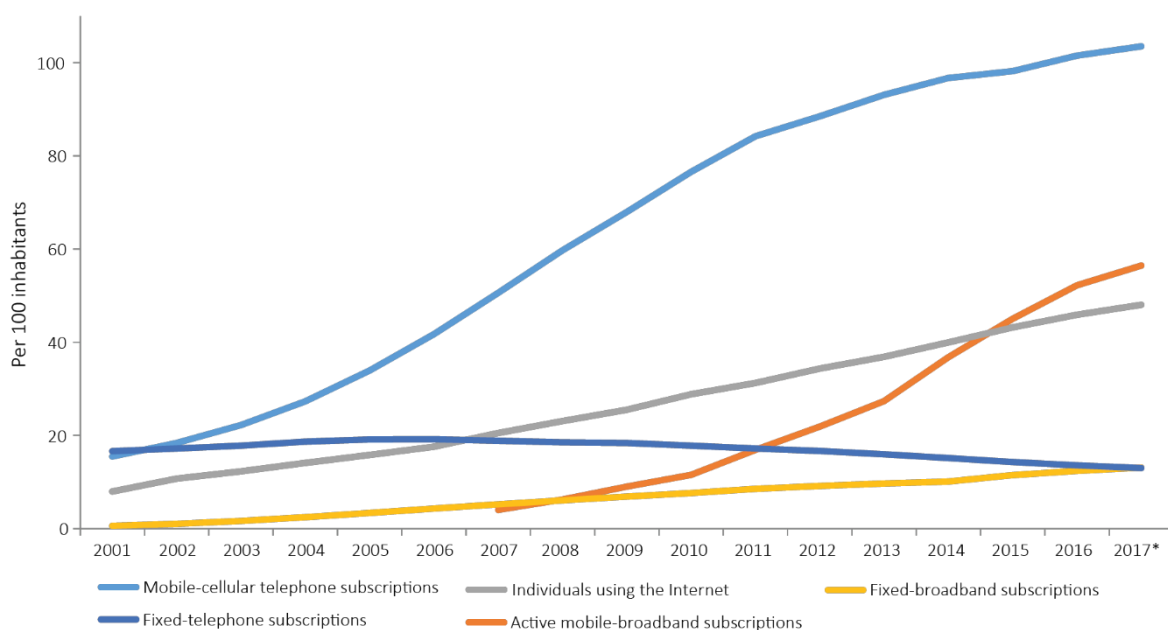
Figure 7: "Global ICT developments, 2001-2017" (Itu.int, 2017, p.3).

However, the basic objective of this measuring information society (MIS) report is to provide an overview of information and communication technology trends, at the global and regional levels in many countries, especially in developing regions.

The report presents the results of two reliable reference approaches to monitor developments of the information society in most parts of the world. These approaches are indicators to rank the countries' performances regarding ICT. The first indicator is the IDI index, which is considered the key approach in this process; the other is the ICT price basket (IPB), which collects the data related to mobile services, such as the mobile fees in each of the countries and compares the results. This information is taken from the ITU report at http://www.itu.int.

3.5.1 Introduction to the IDI Index:

The IDI idea was developed by ITU in (2008). The first edition of the IDI was issued in 2009. The IDI index combines 11 indicators into one benchmark measure that observes and compares development in ICT sectors across the world.

However, according to (ITU report. 2017. v 1, pp iv) "The most important aspect of the IDI is that countries should track their own year on year progress and make policy adjustments to grow their countries' telecommunicate on/ICT sector."

Also, there are basic measurement objectives of the IDI are as follows:

Firstly, to evaluate the levels of ICT development in countries over time and compare them.

Secondly, to monitor the progress of ICT development in both developed and developing nations; regardless, the index should be global and observe all changes regarding ICT development at each level;

Thirdly, to focus on the digital divide and on measuring the differences between countries with regard to the level of digital progress.

Finally, to evaluate the growth of ITC development based on available capabilities and skills.

"The latest IDI ranks the performance of 176 economies with regard to ICT infrastructure, use and skills, allowing for comparisons to be made between countries over time." (ITU report. 2017. v 1, pp iv).

3.5.2 The ITU IDI Index Conceptual Framework

The IDI index is divided into three sub-indexes:

"Initially the access sub-index: this sub-index captures ICT readiness and includes five infrastructure and access indicators (fixed-telephone subscriptions, mobile-cellular telephone subscriptions, international Internet bandwidth per Internet user, percentage of households with a computer, and percentage of households with Internet access);

Next, the use sub-index: this sub-index captures ICT intensity and includes three ICT intensity and usage indicators (individuals using the Internet, fixed [wired]-broadband subscriptions, and wireless-broadband subscriptions);

To conclude, the skills sub-index: this sub-index captures ICT capability or skills as indispensable input indicators. In the absence of data on ICT skills, it includes three proxy indicators "adult literacy, gross secondary enrolment and gross tertiary enrolment and is therefore given less weight in the computation of the IDI compared with the other two sub-indices." (ITU, 2013, p. 18).

However, each one of these sub-indexes covers specific areas for measuring information society development.

3.5.3 Overview of the 11 ICT Measurement Indicators

The ICT 11 indicators are divided into three groups: ICT infrastructure and access indicators, ICT use indicators and ICT skills indicators.

ICT Infrastructure and Access Indicators

These measure the ICT infrastructure and individual access to basic ICT services in most countries in order to measure the ICT development in the society and they include five indicators:

A.ICT Use Indicators

All data for this group were collected by ITUs. Nevertheless, this group consists of three indicators that refer to ICT intensity and usage.

Firstly, percentage of individuals using the Internet:

Data are collected on individuals and how they use the Internet from any location, for any purpose, and by using any types of devices, including PCs, laptops, mobile devices, gaming machines or digital TV. Access may be via a fixed or mobile network.

Secondly, fixed (wired)-broadband subscriptions per 100 inhabitants:

Fixed (wired)-broadband subscriptions refer "to the number of subscriptions for high-speed access to the public Internet (a TCP/IP connection). High-speed access is defined as downstream speeds equal to, or greater than, 256 Kbit/s. Fixed (wired)-broadband includes cable modems, DSL, fiber and other fixed (wired)-broadband technologies (such as Ethernet LAN and broadband-over-power line (BPL) communications). Subscriptions with access to data communications (including the Internet) via mobile-cellular networks are excluded." (ITU, 2013, p. 210).

Thirdly, wireless-broadband subscriptions per 100 inhabitants:

"Wireless-broadband subscriptions refer to the sum of satellite broadband, terrestrial fixed wireless-broadband and active mobile-broadband subscriptions to the public Internet. Satellite broadband subscriptions refer to the number of satellite Internet subscriptions with an advertised download speed of a minimum 256 Kbit/s; this refers to the retail subscription technology, and not the backbone technology.

a) Terrestrial fixed wireless broadband subscriptions refer to the number of terrestrial fixed wireless Internet subscriptions with an advertised download speed of at least 256 Kbit/s. This includes fixed WiMAX and fixed wireless subscriptions but excludes occasional users at hotspots and Wi-Fi hotspot subscribers. It also excludes mobile-broadband subscriptions where users can access a service throughout the country wherever coverage is available.

b) Active mobile-broadband subscriptions refer to the sum of standard mobile-broadband subscriptions and dedicated mobile-broadband data subscriptions to the public Internet. It covers actual subscribers, not potential subscribers, even though the latter may have broadband-enabled handsets.

Standard mobile-broadband subscriptions refer to active mobile-cellular subscriptions with advertised data speeds of 256 Kbit/s or greater that allow access to the greater Internet via HTTP and which have been used to set up an Internet data connection using Internet protocol (IP) in the past three months. Standard SMS and MMS messaging does not count as an active Internet data connection, even if the messages are delivered via IP.

Dedicated mobile-broadband data subscriptions refers to subscriptions to dedicated data services (over a mobile network) that allow access to the greater Internet and which are purchased separately from voice services, either as a stand-alone service (e.g. using a data card such as a USB modem/dongle) or as an add-on data package to voice services, which requires an additional subscription. All dedicated mobile-broadband subscriptions with recurring subscription fees are included regardless of actual use. Prepaid mobile-broadband plans require use if there is no monthly subscription. This indicator could also include mobile WiMAX subscriptions." (ITU, 2013, P.211).

C) ICT Skills Indicators

Firstly, the adult literacy rate is used, which measures the percentage of people in the society who are able to use the ICT resources.

Secondly, gross enrolment ratio (secondary and tertiary level) is used.

According to UIS, "The gross enrolment ratio is the total enrolment in a specific level of education, regardless of age, expressed as a percentage of the eligible official school-age population corresponding to the same level of education in a given school-year." (ITU, 2013, p. 211). Also mean years of schooling, secondary gross of enrolment ratio and tertiary gross of enrolment ratio.

All these indicators blow in the table, moreover the result about the countries on this study will be presented in (chapter 6).

ICT access	Reference value	(%)
1. Fixed-telephone subsections per 100 inhabitants	60	20
2. Mobile-cellular telephone subscriptions per 100 inhabitants	120	20
3. Internaonal Internet band with (bit/s) per internet user	2'158'212*	20
4. Percentage of households with a computer	100	20
5. Percentage of households with Internet access	100	20
ICT use	Reference value	(%)
6. Percentage of individuals using the Internet	100	33
7. Fixed-broadband subscriptions per 100 inhabitants	60	33
8. Active mobile-broadband subscriptions per 100 inhabitants	100	33
ICT skills	Reference value	(%)
9. Mean years of schooling	15	33
10. Secondary gross enrolment ratio	100	33
11. Tertiary gross enrolment ratio	100	33

Figure 8: "ICT Development Index – indicators, reference values and weights."
(Itu.int, 2017, p.27).

3.5.4 ICT Price Basket

There are other approaches used by the ITU to measure an Information society, such as the ITC Price Basket (IPB), three price sets, referred to as "sub-baskets': the fixed-telephone, mobile-cellular and fixed-broadband sub-baskets. 'The IPB is the value calculated from the sum of the price of each sub-basket (in USD) as a percentage of a country's monthly GNI per capita, divided by three. The collection of price data from ITU Member States and the methodology which refer to the service prices in each ITU member countries." (Itu.int, 2013, p. 217).

3.5.5 Summary for the ITU Index

In this background, the researcher has found that the index is one of the most important approaches. However, some points concerning the index remain to be discussed.

Firstly, the index measures the information society using two types of approaches: the IDI index and the IPB.

The IDI index is divided into three groups ICT access, ICT use and ICT skills.

Generally, the index is easy to use and well explained. Also, the information is presented using simple language. The index is annually updated with ITU members. Currently, there are 176 members from developed and developing countries, including Saudi Arabia, the UK and the United Arab of Emirates. Also, the index has sub-index indicators that help if the main index is not enough for measurement, or to add extra detail. Therefore, it is very important to ensure that the input data will reflect a country's actual level of ICT access, usage and skills.

The most recent annual update was the two-volume version of June 2017.

The first volume includes; the current state of ICTs, The ICT Development (global analysis), The ICT Index (regional and country analysis and Emerging ICT trends. The second volume includes; the result of each member countries of the organization.

However, the index has some weaknesses:

Firstly, missing data; there are two data collections. The first data are provided directly to the ITU by national statistical offices (NSOs).an ITU team carries out the necessary research to obtain the data (for example, from NSO websites). This is not a huge issue in most developed and larger developing countries, where the indicator used is a percentage of individuals using the Internet and based on results from national household surveys.

Still there are some difficulties, especially for countries that do not include Internet usage questions in national household surveys; therefore, the ITU estimated the percentage of individuals using the Internet based on a model that includes covariate indicators, such as fixed-telephone subscriptions, fixed-broadband subscriptions, xaffa active mobile broadband subscriptions and GNI per capita. Therefore, the actual number of users is usually less accurately measured in developing economies, where data are not available. As a result, the index's most weak point is that the data are not always accurate.

Secondary, normalization of data is significant. Normalization of the data is important before any aggregation can be made to ensure that the data set uses the same unit of measurement (Itu.int, 2017). This information is taken from the ITU report at http://www.itu.int.

United Kingdom	Saudi Arabia
IDI 2017 Rank	
5	54
IDI 2016 Rank	
5	45
IDI 2017 Value	
8.65	6.67
IDI 2016 Value	
8.53	6.87

IDI ACCESS SUB-INDEX	
9.15	7.21
Fixed-telephone subscriptions per 100 inhabitants	
52.20	11.96
Mobile-cellular telephone subscriptions per 100 inhabitants	
122.32	157.60
International internet bandwidth per Internet user (Bit/s)	
449136.94	78162.62
Percentage of households with computer	
89.82	68.97
Percentage of households with Internet access	
91.25	94.60

IDI USE SUB-INDEX	
8.38	5.68
Percentage of individuals using the Internet	
94.78	73.75
Fixed (wired)-broadband subscriptions per 100 inhabitants	
39.18	10.81
Active mobile-broadband subscriptions per 100 inhabitants	
91.44	78.53

IDI SKILLS SUB-INDEX	
8.17	7.57
Mean years of schooling	
13.30	9.60
Secondary gross enrolment ratio	
127.81	108.29
Tertiary gross enrolment ratio	
56.48	63.07

Table3: Compare UK to Saudi using access, use and skills indicators Source (Itu.int, 2017).

United Arab Emirates	Saudi Arabia

IDI 2017 Rank

40	54

IDI 2016 Rank

34	45

IDI 2017 Value

7.21	6.67

IDI 2016 Value

7.18	6.87

IDI ACCESS SUB-INDEX

8.11	7.21

Fixed-telephone subscriptions per 100 inhabitants

23.43	11.96

Mobile-cellular telephone subscriptions per 100 inhabitants

204.02	157.60

International internet bandwidth per Internet user (Bit/s)

133748.68	78162.62

Percentage of households with computer

91.00	68.97

Percentage of households with Internet access

94.30	94.60

IDI USE SUB-INDEX

7.09	5.68

Percentage of individuals using the Internet

90.60	73.75

Fixed (wired)-broadband subscriptions per 100 inhabitants

13.30	10.81

Active mobile-broadband subscriptions per 100 inhabitants

156.67	78.53

IDI SKILLS SUB-INDEX	
5.63	7.57
Mean years of schooling	
9.50	9.60
Secondary gross enrolment ratio	
83.58	108.29
Tertiary gross enrolment ratio	
22.04	63.07

Table4: Compare UAE to Saudi using access, use and skills indicators (Itu.int, 2017).

IDI USE SUB-INDEX	
7.09	8.38
Percentage of individuals using the Internet	
90.60	94.78
Fixed (wired)-broadband subscriptions per 100 inhabitants	
13.30	39.18
Active mobile-broadband subscriptions per 100 inhabitants	
156.67	91.44
IDI ACCESS SUB-INDEX	
8.11	9.15
Fixed-telephone subscriptions per 100 inhabitants	
23.43	52.20
Mobile-cellular telephone subscriptions per 100 inhabitants	
204.02	122.32
International internet bandwidth per Internet user (Bit/s)	
133748.68	449136.94
Percentage of households with computer	
91.00	89.82
Percentage of households with Internet access	
94.30	91.25

IDI USE SUB-INDEX	
7.09	8.38
Percentage of individuals using the Internet	
90.60	94.78
Fixed (wired)-broadband subscriptions per 100 inhabitants	
13.30	39.18
Active mobile-broadband subscriptions per 100 inhabitants	
156.67	91.44

IDI SKILLS SUB-INDEX	
5.63	8.17
Mean years of schooling	
9.50	13.30
Secondary gross enrolment ratio	
83.58	127.81
Tertiary gross enrolment ratio	
22.04	56.48

Table 5: Compare UAE to Saudi using access, use and skills indicators Source (Itu.int, 2017).

The table (5) above provide results of comparison between the three countries

As shown by the results, the data used to reach the results are quite different from the method used by the researcher in this study. The results in this report related to fixed and mobile phones and the use of the Internet. While, the researcher method is measuring E- services ...etc.

"The 9th edition of the Measuring the Information Society Report, an annual report published by ITU since 2009, features key ICT data and benchmarking approach to measure the information society, the ICT Development Index (IDI). The report presents a quantitative analysis of the information society and highlight new and emerging trends and measurement issues. The MISR 2017 assesses IDI findings at the regional level and highlights countries that rank at the top of the IDI and those that have improved their position in the overall IDI rankings most dynamically since 2016. It also uses the findings of the IDI to analyze trends and developments in the digital divide. It includes for the

first-time individual country profiles providing a snapshot of the latest ICT landscape and efforts made to increase the ICT access, use and proficiency of their citizens. The analytical report is complemented by a series of statistical tables providing country-level data for the indicators included in the IDI." (ITU,2018, p.1).

Key indicators for Saudi Arabia (2016)		Arab States	World
Fixed-telephone sub. per 100 inhab.	12.0	7.7	13.6
Mobile-cellular sub. per 100 inhab.	157.6	107.1	101.5
Fixed-broadband sub. per 100 inhab.	10.8	4.7	12.4
Active mobile-broadband sub. per 100 inhab.	78.5	45.2	52.2
3G coverage (% of population)	97.2	81.9	85.0
LTE/WiMAX coverage (% of population)	88.0	33.8	66.5
Mobile-cellular prices (% GNI pc)	0.7	4.3	5.2
Fixed-broadband prices (% GNI pc)	1.1	10.1	13.9
Mobile-broadband prices 500 MB (% GNI pc)	1.0	4.5	3.7
Mobile-broadband prices 1 GB (% GNI pc)	0.6	5.5	6.8
Percentage of households with computer	69.0	43.3	46.6
Percentage of households with Internet access	94.6	45.3	51.5
Percentage of individuals using the Internet	73.8	41.8	45.9
Int. Internet bandwidth per Internet user (kbit/s)	78.2	39.0	74.5

Figure 9: Data of Saudi, ITU estimates. Source (Itu.int, 2017).

3.6 The OECD Guide to Measuring the ICT

3.6.1 Introduction to the Guide

According to the OECD site. OECD refers to Economic Co-operation and Development and was established in October 1961 with 34 countries; its main purpose was to support economic growth and international trade. The OECD took part in the partnership as it

saw that ICT development is positively correlated with its main goals: economic growth and international trade (OECD, 2011).

Report by OECD (2011) provided ICT indicators for measuring an information society and made comparisons between the OECD member countries. In addition, the report addressed different sectors that are used to measure an information society.

The OECD Guide facilitate improved harmonization of practices around statistics. This, in turn, will enable better international comparability of data, a key requirement for benchmarking, identification of relative strengths and weaknesses and tracking progress.

According to OECD (2011, p.15) "The Guide will be useful for countries that already have measurement programmed, and for those yet to start. Newcomers to the field can expect to progress more quickly than they might have done in its absence. They can benefit from work already advanced and be assured that the outputs of their efforts will be as comparable as possible to those of other countries. It is envisaged that, as work continues, the Guide will develop and improve in order to better serve the needs of OECD member countries and the international community at large."

3.6.2 Scope and Content of the OECD Guide

The Guide focuses most attention on the work done by the OECD, including definitions of ICT, as well as content and media sectors and their products; it includes measurement of ICT use by households/individuals and businesses, as well as work on the definition and measurement of e-commerce. It includes WPIIS work undertaken on e-business measurement, e-government, trust in the online environment and ICT investment. It also covers other selected work on ICT measurement, from within the OECD and elsewhere, including: infrastructure, prices, patents, digital content, the digital divide, skills, education, occupations and the impacts of ICT. This information is taken from the OECD site.

The OECD report (2011) shows that the Tunis phase of WSIS agrees that the development and improvement of the ICT indicators are necessary for measuring the digital divide between countries; it is also important for countries and international organizations to allocate appropriate resources. However, that requires the OECD classification for core ICT indictors. In fact, the classification variables are used to describe the indicators for measuring ICT. These classifications are described in (2010) as follows:

• Business characteristics, for example, industry classification (ISIC) and employment size.
• Household characteristics, which refer to the household composition and size.
• Individual characteristics, including age ranges, gender, highest education level received, labour force status, occupation.
• ICT sector (industry classification (ISIC).
• Trade (ICT goods classification).
• Education (levels of education, gender).

According to the OECD (2009), the following are indicators designed by Gardin (2002). Are used by the OECD as approaches for measuring the transformation of society to an information society.

1- Readiness indicators represent the basic set of requirements to support the building of an information society. They measure the readiness of the community itself to make such a move, as well as its ability to take advantage of information and communication technology.
2- Core ICT indicators of ICT infrastructure and access include 10 core indicators of ICT infrastructure and access. There are two broad types of infrastructure and access indicators—those where a higher value implies a better situation in terms of ICT infrastructure and access development, and tariff indicators, where a lower value usually indicates a better situation.
3- Indicators of intensity of use describe the terms and goals used when this technique is used in various sectors, such as business and education. These indicators are essential in the information society and provide the basis for measuring the performance of a society as it builds the information society. There are 12 core

indicators of the access to, and use of, ICT by households and Individuals – six on household access to ICT and six on the use of ICT by individuals. There is also a reference indicator regarding access to electricity by households.

4- Indicators of the impact of use mainly relate to regulatory changes (for business and government).

• New ways of organizing work with respect to the relationship between individuals and institutions.

• New methods of production regarding relations within production facilities and among them.

• Human investment and human capital as a knowledge base.

• The ability to move between communities and competition.

• And innovation, research and development as the basis of the future.

• The other indicators are

• Taken indicators, which measure the final result of what is happening at the level of the production facilities in terms of productivity and social impact.

• Outcome indicators are mainly related to the level of social and economic factors that describe.

• Productivity and competitiveness.

• Employment and the labour market.

• And the lack of homogeneity of social exclusion and social inclusion.

The most important use for these indicators is to measure the ratio of the number of fixed-line and mobile phones, the prevalence of personal computers and the number of Internet users per hundred of the population, where these percentages reflect the level of the spread of communications technology in society, which is an indication of the spread of technology transfer and exchange of information, as well as the size of the pointer information industries and businesses in the community.

In 2014 the OCED published a new report to measure the information society, but this report specializes in measuring the digital economy, this report is very useful and provides a renewal of the indicators used to measure the information society, but this decision to clarify in this study because it does not include the digital economy.

Although this institution is an important institution in the field of measuring the information society, however, the fact that it has not published any report about measuring the information society since (2011) which makes the reliance on the submitted statements old, but this is not only a source for measuring the information society and is still providing measuring approaches that can be found in (OECD, 2018).

The 6 ICT indicators below are the indicators used in order to measuring information society in the latest version (2018). This information is taken from the OECD site.

1-ICT value added

"ICT value added is the difference between the Information and Communication Technology sector gross output and intermediate consumption. The aggregate of information industries here includes ISIC rev. 4 Division 26 (Manufacture of computer, electronic and optical products) and Section J (Information and communication), which in turn consists of Divisions 58-60 (Publishing and broadcasting industries), 61 (Telecommunications) and 62-63 (Computer programming, and Information service activities). Hence information industries here encompass ICT industries (Divisions 26, 61 and 62-63, plus group 58.2, software publishing), with the exception of Trade and repair activities, as well as Media and content industries (included in Divisions 58-60 and in the Group 63.9). This indicator is measured in percentage of value added" (Oecd-ilibrary.org, 2018). This information is taken from the OECD site.

2-ICT employment

"ICT employment is defined as the people working in the Information and Communication Technology (ICT) sector. This indicator is measured as a percentage of business sector employment." (Oecd-ilibrary.org, 2018).

3-ICT investment

"ICT investment is defined as the acquisition of equipment and computer software that is used in production for more than one year. ICT has three components: information technology equipment (computers and related hardware); communications equipment; and software. Software includes acquisition of pre-packaged software, customized software and software developed in-house. This indicator is measured as a percentage of total non-residential gross fixed capital formation." (Oecd-ilibrary.org, 2018).

4-ICT goods

"ICT goods exports is based on the World Customs Organization's Harmonized System (HS) which defines ICT products (including ICT goods). ICT goods must either be intended to fulfill the function of information processing and communication by electronic means, including transmission and display, or use electronic processing to detect, measure and/or record physical phenomena, or to control a physical process. This indicator is measured in million USD" (OECD, 2018).

5-Access to computers from home

"Access to computers from home is defined as the number of households that reported having at least one personal computer in working order in their home. This indicator is measured in percentage of all households" (OECD, 2018).

6-Internet access

"Internet access is defined as the percentage of households who reported that they had access to the Internet. In almost all cases this access is via a personal computer either using a dial-up, ADSL or cable broadband access. This indicator is measured in percentage of all households" (OECD, 2018),

Also, OECD's provide an annual Education at a Glance books (2014-15-16-17-18) looks at who participates in education, what is spent on it, how education systems operate, and the results achieved. The latter includes indicators on a wide range of outcomes, from comparisons of students' performance in key subject areas to the impact of education on earnings and on adults' chances of employment. (OECD, 2018).

3.7 The UN-ESCWA.

Iinformation on the UN-ESCWA programmed is given on its website at http://isper.escwa.un.org.

The UN-ESCWA refers to the United Nations Economic and Social Commission for Western Asia. It was created in 1973 and the headquarters is located in Beirut. The agency's main goal is supporting economic and social development in the countries of

the region; the agency is a member of the WSIS (Al-Dafa, 2010). Its main objectives are to promote cooperation and social development in the countries of the region; it also encourages exchange between members and achieving brotherhood between members. This organization only deals with issues relating to Arab countries.

Setting a plan for shifting to an information society depends largely on the core indicators for communications and information technology, indicators of human resources, the digital divide and the availability of a regional database updated for these indicators. Currently, there are some modest efforts by some international institutions and some Arab countries, individually, to develop indicators and update them: to enable stakeholders to use the database in the process of decision making and planning for the development of the information society in Saudi; to promote studies and research-oriented information societies by facilitating the work of researchers, providing a wealth of information and knowledge gained concerning the information society in Saudi; to raise awareness of the importance of indicators and indicators of overall indicators of the information society. This information is taken from the UN-ESCWA site at http://isper.escwa.un.org.

The Government and Stakeholders Roles in Building the Information Society

The effective participation of governments with all parties concerned is an essential step to building an information society. It is necessary to adopt policies and formulate strategies for mobilizing all stakeholders in the various sectors of the state institutions and encouraging them to use information and communication technologies, and to disseminate the opportunities created by the information society. However, the government and stakeholder roles considered in general are not amenable to being used as a measurable indicator, and no evidence of such use has been found.

The UN-ESCWA ICT indicators used to measure an information society on (2014) are divided into nine groups. Each group contains the following:

1- Computer and Internet indicators that measure through
- Access to the Internet

- Available national bandwidth [Mbps]
- Awareness of the Internet
- Bits per person
- Broadband subscribers
- Broadband subscribers per 100
- Dial-up Internet tariff [per month]
- Dial-up Internet traffic

2- The ICT Infrastructure

The infrastructure for ICT is a cornerstone for reducing the digital divide between countries and communities by providing access to save both at the national and regional levels, and especially in remote and rural areas.

3- Access to Information and Knowledge

ICT provides an approach to facilitate access to information and knowledge for individuals, organizations and communities. Therefore, this area seeks to promote and raise the level of knowledge and to increase access to information and knowledge.

4- Capacity-Building

This area seeks to develop the skills that are necessary to take full advantage of the information society and is building capacity in the field of information and communication technology to support the main pillar, as well as the continued development of the information society; this should include capacity-building for all groups in society. Building Confidence and Security in the Use of ICTs. The importance and value of digital information is increasing. This area tackles specific requirements with regard to security and privacy and the protection of personal information, especially in the cases of individuals, and business information in the cases of institutions.

1- Enabling the ICT Environment

The provision for enabling an environment is necessary to mobilize resources and to create a climate conducive to the acquisition of information technology and communication and dissemination. In addition, national policies and organization a structure is a fundamental basis for cooperation between the public and private sectors.

2- ICT Applications

ICT thematic applications can support sustainable development for building an information society in the areas of e-government, e-commerce and e-education, e-health and e-recruitment.

3- Cultural Diversity and Identity, Linguistic Diversity and Local Content

The Arabic digital content, particularly content found on the Internet, preserves a common language and national heritage facilitating its evolution and promoting cultural diversity. At the same time, it supports social and economic development. Content development can play a key role in strengthening the leading status of the region.

4- Media

Because of the media's ability to reach a large segment of people, and its ability to disseminate ideas, facts and information, it plays an important role in the promotion and development of communities of informatics, as well as in the achievement of freedom of expression and the diversity of information sources.

5- International and Regional Cooperation

The international and regional cooperation between concerned information societies is a key factor for success in this society, and this area is designed to encourage a dialogue between stakeholders in different countries to strengthen the partnerships between public and private entities, as well as multilateral partnerships.

6- Millennium Development Goals-MDG

The use of information and communication technology is an important factor in achieving the Millennium Development Goals, not only in terms of strengthening communication and exchanging information, but also extending to support development initiatives, particularly those related to social and economic goals. The MDG has embarked on aiding more governments and international organizations, and increasingly, has assisted in the integration of information and communication technology in countries' development plans.

To summaries, the indicators that are provided by UN-ESCWA cover all areas relating to the development of the information society in the Arab region. However, the indicator plan includes different sections; unfortunately, the link that provides data and statistics about Saudi Arabia or any other neighboring countries is not valid. This information is taken from the UN-ESCWA site at http://isper.escwa.un.org

3.8 The UIS

3.8.1 The UIS Guide Overview

UIS is a UNESCO Institute for Statistics, it is a source of data regarding statistics about education, culture, communication, signs and technology for over 200 nations (UIS, 2015). The UIS guide provides a comprehensive set of indicators that are internationally comparable, and which concern the use of ICT in education. In addition to the standard definitions of basic concepts, and measurements according to detailed specifications, the Guide serves as a practical means to interpret the indicators in an appropriate manner. These cover the proposed set of new indicators and a wide range of areas and conceptual policies at the international and national level (such as the World Summit on the Information Society, the MDGs and Education for All). These indicators provide several angles from which to assess the force of ICT in educational systems and from the perspective of existing comparisons. There are eight core indicators of ICT in education and one reference indicator on the proportion of schools with electricity. The complete list is shown in Annex 8. A3. These indicators are new to the list of core ICT indicators, although they have been in development by the UNESCO Institute for Statistics (UIS) for several years. The ICT in education indicators have been subject to extensive testing and consultation. The key principles for selection of the indicators include policy relevance, feasibility of reliable data collection, minimization of data collection burden and international comparability (UIS, 2009;2015). This information is taken from the UIS site at http://uis.unesco.org/sites/default/files/documents/brazil-2016-role-uis-2-1-en.pdf

A) UIS Basic Core Indicators for ICT in Education

Percentage of schools with electricity (by ISCED levels 1 to 3)

Percentage of schools with radio set used for educational purposes (by ISCED levels 0 to 4)

Percentage of schools with television set(s) used for educational purposes (by ISCED levels 0 to 4)

Student-to-computer ratio (by ISCED levels 0 to 4)

Percentage of schools with basic telecommunication infrastructure or telephone access (by ISCED levels1 to 3)

Percentage of schools with Internet connection (by ISCED levels 1 to 3)

Percentage of students who use the Internet at school (by ISCED levels 0 to 4)

B) UIS Extended Core Indicators for ICT in Education

Percentage of students enrolled by gender at the tertiary level in ICT-related fields (ISCED levels 5 to 6)

Percentage of ICT-qualified teachers in primary and secondary schools (of the total number of teachers)

To develop indicators for the UNESCO Institute for Statistics (UIS) in the measurement of ICT in education, the first step was initiated in the corporal areas of interest for policy makers and knowledge of policy areas, which are the focus of the attention of member states. However, the UIS can respond through the development of indicators to measure progress in these areas.

The list below provides the framework that UIS used to develop the ICT core list in education indicators. The main classificatory variable used for ICT in education indicators is the 1997 version of the International Standard Classification of Education (ISCED), maintained by UNESCO. ISCED recognizes several levels of education as follows:

ISCED 1 – Primary education or first stage of basic education

ISCED 2 – Lower secondary or second stage of basic education

ISCED 3 – Upper secondary education

ISCED 4 – Post-secondary, non-tertiary education (programmers that lie between the upper-secondary and tertiary levels of education)

ISCED 5 – First stage of tertiary education (not leading directly to an advanced research qualification)

ISCED 6 – Second stage of tertiary education (leading to an advanced research qualification)

Overall, UIS indicators include all education levels which give any researcher a clear point of view about the status of the country in the educational sector; however, indicators are mainly focused on the Internet and on technology's role in the society (UIS, 2015). This information is taken from the UIS site at http://uis.unesco.org/sites/default/files/documents/brazil-2016-role-uis-2-1-en.pdf

3.9 Similarities

1- All agencies are international organizations; in fact, they are in partnership in terms of measuring ICT development, except UN-ESCO.

2- Saudi Arabia is a member of all the agencies. but the data generated is different from that sought in this study. These indicators focus on measuring the readiness of countries in terms of technology as measured by factors such as the speed of intranet mobile phone services, and the number of computers per person. This study focuses on measuring the performance of government institutions in terms of equipment, technology and the interaction of government employees with this change in terms of measuring use and skills, and how this transformation affects the transformation of the Kingdom into an information society.

3- All agencies publish an annual report on the measurement of an information society.

4- All have specific indicators to measure an information society.

5- For all organizations, the ICT infrastructure and access indicators are widely available, and their data are easier to collect. Meanwhile, the social and economic indicators are less frequently used.

6- For measuring ICT impact, the researcher noticed that the social and economic impact has just begun in developing countries.

All this information was derived from the official websites of the stated members of the WISI.

Organization	Indicator	Method	Tools	Compared countries
ITU	Divided into measure ICT readiness, skill and use but focuses on telecommunicati-on	Survey and data from HOSN	IDI index and IPI basket price	Saudi Arabia UAE UK
OECD	Measuring ICT readiness, skill and use but divide by sectors	Survey	Questionnaires	Saudi Arabia UAE UK
UIS	Concerned with statistics only related to education	Survey	Questionnaires	Saudi Arabia UAE UK
EU-ESCO	Concerned with indicators only related to arab region	Survey	Questionnaires	Saudi Arabia UAE

Table 6: ICT indicators for measuring the information society from different organizations.

3.10 Summary

This chapter has included different views about ICT indicators from different scientists including the Johoca Index and the Gardin Index, also different points of view from different organizations were explored which helped the researcher to understand the ICT approaches available for measuring an information society. Reports from organizations helped to determine the positioning of Saudi in the development spectrum as an information society.

This chapter helped the researcher explore ICT indicator approaches available that might be used in the research, thus contributing to the formulation of the researcher's unique combination of ICT indicators that will be more suitable when applied in Saudi Arabia. The following chapter will discuss the methodology of this research in detail.

Chapter Four

Methodology

4.1 Introduction

Research refers to, "Something that people undertake in order to find out things in a systematic way, thereby increasing their knowledge" (Saunders, 2011, p.3). In general, research can be undertaken for two different purposes: to solve the existing problem in the work setting, and to contribute to the general body of knowledge in particular area of interest to the researcher (Sekran and Bougie, 2013). Based on Sekaran and Bougie Classifications, this study falls into the second category in relation to its purposes because it aims to understand more about Saudi as information society. This chapter explains in detail the research methodology. and the framework of the research was outlined to gain a more holistic view of the study in order to offer an understanding of the Saudi institution electronic systems under study, and that must be based on reality and be clear in all its stage. Then the ICT indicators used are describe.

4.2 Research methodology

Research methodology is a very important aspect of any kind of research; however, there are three types of methods and each one is appropriate for different kinds of research. Saunders, (2011) divide, research methods into three types: qualitative, quantitative and mixed methods. This study has adopted a qualitative approach for collecting and analyzing findings to assess the current advancement of Saudi society with regards to information society in two main sectors, education and health.

The researcher has also conducted a comprehensive comparison of extracted findings with other advanced societies, including the UAE and UK to arrive at a meaningful conclusion and provide useful insights for practical implementation. This was done by using online surveys in the educational and health sectors in each country, to compared against each other to reach a clear result on the efficiency of Saudi Arabia in the transition into an information society. The methods and how they were used elaborated in the following sections.

4.2.1 Quantitative Method

The quantitative method consists of numerical methods, survey methods, laboratory experiments and formal methods. Furthermore, quantitative methods are used in social sciences and in natural sciences to study logical phenomena (Crewell and Clark, 2010). It is also considered cheap and does not take a lot of time to do. But also, it comes with some disadvantages, as some data may be quickly out-of-date and will not be useful in long term.

According to a report by the UN (2009) statistical systems in developing economies are diverse and reflect, among other things, a country's wealth, culture and legal and political frameworks. These factors are considered in this project. This method fits within the research question as data involving numbers and statistics (percentages) were required to help the research reach some important conclusions thus contribute to the research as a whole, for example the percentage of staff that were used e-sources for academic purposes in the university.

4.2.2 Qualitative methods

According to (Hammersley, 2011) when the research is concerned with perceptions, a qualitative approach must be used. This is the case here. Bryman and Bell (2016, p.55) defined the qualitative method as "approach which the researcher uses to measure the human behavior about some issues, which is usually used in society since in addition, in this approach, the researcher could use different types of approaches to collect their data. For example, surveys, personal interviews, telephone interviews, questionnaires and observation method.". The qualitative method was used in this project, because the research measured Saudi society that would address the transformation of Saudi society into an information society involving Saudi people. However, according to Yin (2009), since the research is concerned with 'perceptions', a qualitative approach must be used, to complete quantitative data collection (Bernard, 2006; Pickard,2013).

4.2.3 Mixed Methods Research

A mixed method approach refers to a combination of quantitative and qualitative methods that are used in a single study. In fact, this approach is supported by some researchers such as Kaplan and Douchon (1998). By mixing methods, the researcher will reach a better understanding. A mixed research method is designed research that comprises two or more methods, which are methods of inquiry as well as a philosophical assumption. As a methodology, it collects and interprets the data, through a mixture of both qualitative and quantitative approaches. On the other hand, it is concerned with bringing together, analyzing and mixing both types of data mentioned above in one or more studies. This is because mixing both approaches results in a better understanding of problems in the research (Crewell and Clark, 2010; Creswell, 2014; Kumar, 2019).

The research has adopted the sequential explanatory approach where the researcher had firstly collected the quantitative data to highlight the main issues. Afterwards, extracted quantitative findings were used as basis to formulate the questions for interviews.

4.2.3.1 Advantages and Limitations of Mixed Method Research

Both methods are very different, and by combining them a researcher may reach a balanced outcome in which both complement each other. According to Miles, Huberman, and Saldaña, (2014). Both types of data can be productive for descriptive, reconnoitering, for explanatory, confirmatory, hypothesis-testing purposes.' However, using this approach for research was most suitable for this project, as it required both qualitative and quantitative information to be enough in order to give a fair comparison between the countries (Miles, Huberman, and Saldaña, 2014).

Advantages of a mixed method result include,

Understanding of quantitative results more clearly as the sample may give useful open-ended answers to help understand a particular viewpoint. More explanation may be needed when there are unexpected results from the quantitative research.

As with any method, mixed method research also comes with limitations and they include the facts that:

- It is more time consuming as the researcher combines two different research methods and may have to have separate approaches for each method.
- There must be a conveniently significantly large samples for both methods to make the results reliable.

This method serves the research purpose more accurately than the other two methods; the reason for this is that the research consists of data in the form of percentages and numbers (quantitative) along with verbal responses from samples in the form opinions and feedback (qualitative). By combining results from both approaches, the researcher obtained a clearer idea of the situation in order to make an accurate comparison with the countries mentioned.

Bias may occur in both quantitative and qualitative research, and a researcher must guard against it in different ways, by designing and using a rigorous protocol for collecting and analysing data.

In a quantitative study, the researcher may guard against bias by the correct choice of variables to measure, so that they will correctly and fully represent the aspects of the situation being investigated. Further, the data collection process must be designed to avoid bias, in particular by a sampling process which produces a study population representative of the target population. Finally, the data collected must be analysed properly, for example choosing the appropriate statistical test to avoiding finding spurious significance in the results.

In a fully- or partly qualitative study, the researcher may again avoid bias by choosing the context for the study - individuals, groups or settings - to be properly representative of the situation studies. The data collection process, and sampling, must again be appropriate. However, in some qualitative studies, for example, those based in ethnography or grounded theory, the researcher may themselves be involved in the situation under investigation, and this may cause a particular danger of bias in interpreting the results. This can be avoided by a rigorous data collection and analysis process, using, for example, cross-checking of results, and explicit consideration of alternative ideas arising from the data.

In both cases, the researcher should, as much as possible, be aware of their own pre-existing biases, and ensure that they do not influence the results. In the present study, for example, the researcher believes that it is necessary that Saudi Arabia should progress towards becoming an information society and regrets the obstacles to this. However, the research has been designed so that these opinions of the researcher do not influence the nature of the results of the study (Newing et al., 2010).

4.3 Research population

According to Sekaran and Bougie (2013, p.263) the term "Population" refers to "the whole group of people, events or things of interest that are under investigation. The population frame is a listing of all the elements in the population from which the sample is drawn." The population of this project is the staff and managers from Saudi Arabia, UAE and UK who working in education and health secretes.

4.4 The Research Framework

As the goal of this project is to measure Saudi as an information society, it was necessary to find a framework that included theories from (Webster, 2006); and (Gardin, 2002). To monitor the devolvement of Saudi as an information society in the educational and health sectors. Also, the researcher has contacted sample (staff and managers) from different departments. and then analyses the material in order to reach a more complete understanding of the current situation in Saudi Arabia as an information society.

However, research method in detail in the next paragraph

In this research the researcher has used Webster's (2006) model as the theoretical basis for the work especially in the technological and occupational areas. additionally, Webster explained the areas through which an information society can be identified; however, he did not set out the methods, whereas Gardin's (2002) set out four measurement categories in order to measure and define the extent of the development of an information society in areas suggested by Webster (2006).

The researcher then identified the sectors to be investigated, namely the education and health sectors, with information society development measured in health and educational institutions.

The researcher then identified the specific sections and services to be measured in the health and educational institutions and then designed a questionnaire that includes measurement indicators and services to be measured. Thus, through the results, the researcher could assess the development of this institution and its contribution to transforming Saudi Arabia into an advanced information society.

This is a new way to measure the development of information society, by measuring the services provided in various departments and the use of services by individuals within government institutions.
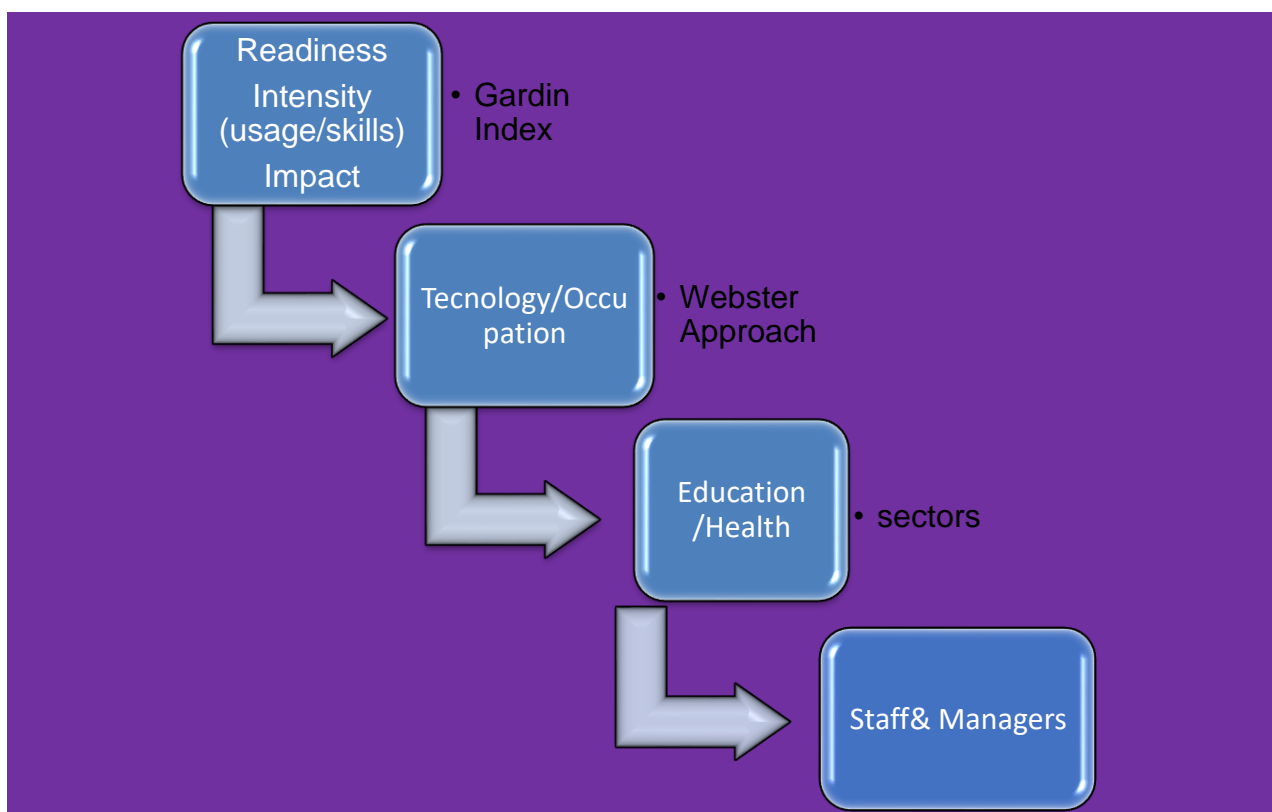
Figure 10: The project framework (Image by O. Alabdali).

However, ICT indicators that were used by international organizations adapted Gardin's theories and set questions for each of his measurement methods to reach a result; this thesis suggests a range of indicators that identify the prerequisites or the development

of an information society. These consist of ICT readiness, intensity (skills and usage) and impact indicators. Therefore, this thesis highlights a new approach to the measurement of prerequisites and development of an information society, through which the researcher will use some of these indicators as long as they serve the objective of the research, because these indicators do not focus on either the cultural or the social impact on the society in depth. The researcher also wanted to use indicators that measure human capacity, for example, electronic skills along with the availability of electronic resources

Firstly, secondary data which includes all type of resources that already discuss information societies in general and measuring were used along with the data that has already been collected for the same type of research. This data has helped the researcher to focus on the problems of the proposal question. However, the researcher gathered his/her secondary data from journals, articles, books and all other kinds of information resources. Also, the researcher has used government reports in order to collect some facts, and reports from international organizations that shows the rank of each country. (More details provided in chapter 6).

Overall, this study methodology ensured the reliability of the framework, and the measurement by use of ICT indicators is one way to measure if the country is ready to transfer from an earlier state into an 'information society' (Karvalics, 2007).

4.5 ICT Indicators for this Project:

The reason the researcher has chosen to use the ICT indicators as an analytical approach is that, according to Karvalics (2007), using these ICT indicators will give a clear image of the country status regarding its status as an information society; also, these indicators are globally agreed on. The most important point of these indicators is that they are flexible and can be manipulated easily to help the researcher reach the research objective.

 More details were provided in the framework of this project in section (4.4).

The Gardin approach (2002) is explained in more detail below:

Readiness: regarding this research, most of these indicators were related to the technology infrastructure (ICT infrastructure) at the public universities and hospitals in five Saudi cities.

Intensity: two different indicators measured this area:

ICT skills: measured the ability of individuals in terms of dealing with communication and information technology. (Information derived from staff and managers).

ICT use: measured the interaction between individuals and organizations with information and communication technology either by producing, sharing or receiving it. For example, using scientific research and using electronic sources (information derived from academic and medical staff and managers).

Impact: The researcher used indicators to measure the impact of using information and communication technology with a view to improve Performance of institutions and how that affects the education and health sectors in Saudi, and to what extent this has an effect on the process of shifting Saudi to a developed information society (information derived from managers).

Outcome: The outcome indicator measured the result of using information and communication technology in Saudi Arabia. By measuring the results of the other indicators.

The researcher chose the Gardin Index instead of the Johoca Index for the following reasons

1-Gardin ICT indicators approach is more suitable for this study as the Gardin approaches focus on the Readiness of the society, Intensity (usage /skills) Impact, and outcome which is more suitable for the nature of Saudi society as it is still a developing society. The Johoca index focuses on the amount of information, the Distribution of communication media, and the Quality of information activities, an information metric of each country that in the researcher's opinion is more suitable for measuring developed countries.

1- The Gardin approaches are more flexible and cover more and different areas for example, measuring the staff skills.
2- The nature of this study is that it measures IT skills and use for all people in the society, unlike Jahoca, which focuses only on technical expertise.

In conclusion, it is clear that ICT indicators has helped to define the problems and challenges that need to be addressed and monitored by ICT initiatives and by policy and strategy through decision-makers. Although there is international consensus, there seems to be no clear agreement on the conceptual models for transforming Saudi Arabia into an information society. The question is how we combine the two theories to create the approach that is suitable for measuring the Saudi Information society and serves the aim of this study. Thus, the researcher has decided to use the four ICT indicators (Readiness, Intensity, Impact, and outcome) and to use two out of five areas that were introduced by Webster, and that is based on the nature of Saudi society which are Technology and occupations. The answer of this question is this study has used the Gardin theory (2002) to include ICT indicators Intensity, readiness, impact and outcome). However, to accomplish the research objectives, the Gardin theory is not enough and to overcome this limitation, as Gardin provides the ICT indicators as approach for measuring the information society but not the area where this approach can be applying. Whereas, Webster provides the areas where these indicators can be used. However, the researcher believes that by integrating the theories the measurement of information society will be more comprehensive. And this was clear by the difference between the use of the approaches alone in the pilot study and the results of the main study when the researcher used Webster areas.

Therefore, researcher adopted a mixed approach by integrating Gardin and Webster and chose the two areas occupation and technology to measure the e -service, e-communications, EHR- management, e-learning. The study used Gardin theory for the ICT indicators (readiness, use, impact and outcome) to measuring Saudi as information society. Therefore, method could be considered as a new approach for measuring the information society and can be used in any area as it easy to change the latter area that need to be measured.

Moreover, this research has not concentrated either on the Internet or the quantity of computers at universities. However, according to Karvaics (2007) measuring the Internet and computer devices is not the best way to measure an information society.

There are two points that must be taken into consideration when using the ICT indicators:

1- These indicators are not fixed but can be manipulated in a way making the researcher reach her objective more easily.

2- Some indicators may be outdated and should be updated regularly to remain reliable in changing times. However, this research has altered these indicators to be more valuable and useful in order to achieve the research's main objectives. Alteration is in the form of more questions or interviews focused on the academic use of ICT rather than general use to reach more accurate and precise results. These categories are flexible, and any can be altered to fit into any specific research.

In contrast (Agal,Ojo and Olugbara ,2013, p. 80) argued that "The lack of consensus operational definition of the concept of information society which was born out of lack of an overarching theory of an impact of ICT on development that can guide research as well as development of measurement instruments is likely the reason for proliferation of different indices among these organizations in measuring the same IS."

4.6 Data collection approach

The researcher decided to use one kind of data collection which is online survey - this data collection approach allows the researcher to meet the project objectives and answer the study questions.

"The success of a survey relies on the clarity of its objectives, which should lead to the design of the right questions. Surveys can be conducted in a variety of ways." (UN, 2005, p. 9).

Some ways used to collect the data for this research are described as follows:

- Using online- surveys and census information.
- Using data provided by private organization ITU.

In this research, the new data was collected by using a survey designed by the researcher in order to reach the objectives of the research.

It is true that the literature review helped the researcher to understand the current situation in Saudi Arabia as an information society; also, it gives the researcher enough background on how the country has developed as an information society with regard to communication technology. However, it was not useful in helping the researcher to learn the viewpoint of the people that represent the society.
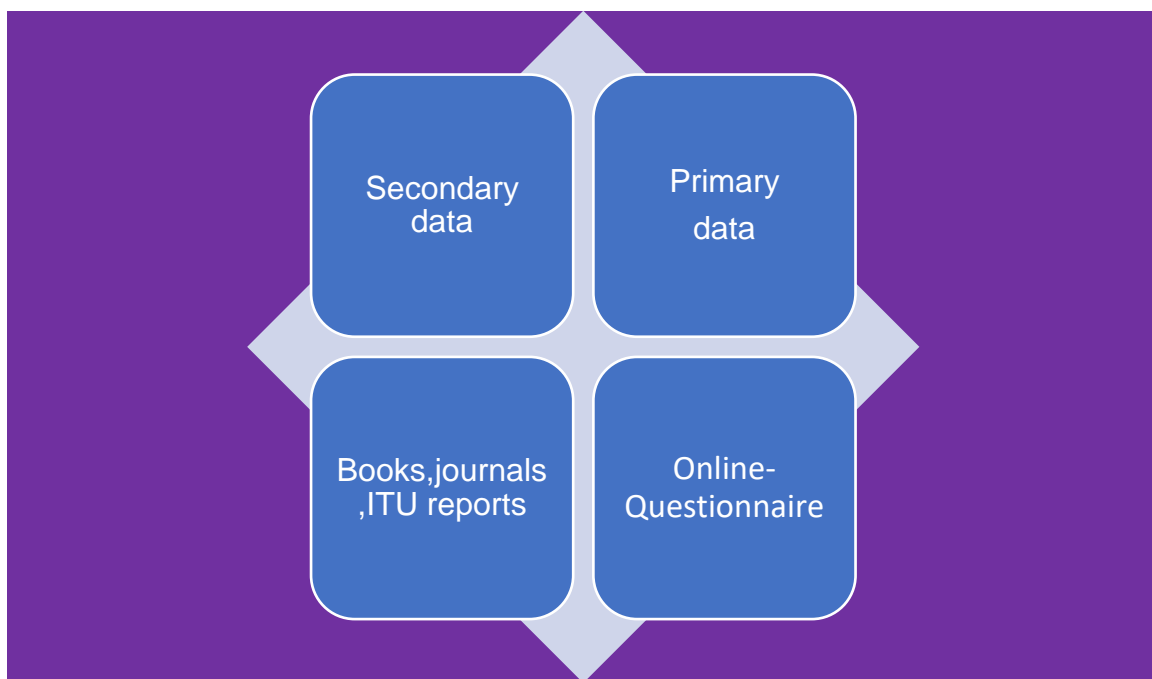
Figure 11: The different Data sources used in this study (Image by O. Alabdali).

However, there are two types of data which is used in order to achieve the aim of this research. As the research is about Saudi Arabia, therefore the researcher was aware that most of the books and academic journals will be in Arabic. That does not mean that the researcher has not find other resources in English, but these resources were few or just focused on the research topic in general.

Firstly, secondary data which includes all type of resources that already discuss information societies in general and measuring were used along with the data that has

already been collected for the same type of research. This data has helped the researcher to focus on the problems of the proposal question. However, the researcher gathered her secondary data from journals, articles, books and all other kinds of information resources. Also, the researcher has used government reports in order to collect some facts, and reports from (ITU)international organizations that shows the rank of each countries (More details were provide in chapter 3).

Secondly, primary data was collected via online -questionnaires. It is clear that ICT indicators can help to define the problems and challenges which need to be addressed and monitored by ICT initiatives and by policy and strategic decision-makers (Ajala, Ojo and Olugbara, 2013). Although there is international consensus, there seems to be no clear agreement on the conceptual models for transforming Saudi Arabia into an information society.

4.6.1. E-mail Surveys

Askar (1998, p.20) described a questionnaire as "a tool or way for collecting information…. a list of questions directed to the respondents to answer in order to obtain information around a certain issue."

Unlike face-to-face surveys, email surveys come with benefits such as:

1- This method prevents biased results as the researcher does not meet his/her samples.
2- This may be reasonably cheap and can be used to reach a wider range of people (Askar 1998).
3- The researcher has the opportunity to analyses the data more efficiently (Askar, 1998).
4- Using email questionnaire techniques gives time flexibility to samples to answer the questions without any pressure, thus helping to get better results.

On the other hand, it comes with some disadvantages such as:

1- The researcher may choose a sample far different to the target population as he/she does not personally meet the individuals.
2- The responses may be false and misleading (Kaplan and Douchon, 1998).

These will be sent to the various departments in each university in all countries.

According to Floyd and Fowler (1994, p. 99) 'designing a good questionnaire involves selecting the question needed to meet the research objective, testing them to make sure that they can be asked and answered as planned, then putting them into a form to maximize the ease'. All questionnaires were posted on the university networks after acquiring the consent of the head of department for each university.

The researcher has tried to keep the questionnaire brief and easy to complete. It began with an introductory section where the sample respondents have provided their personal details to help the researcher to categories them; however, all the personal data of the samples were kept safe and not disclosed to the public.

Taylor and Renner (2003) pointed out that, there are five different ways to phrase questionnaire questions YES-NO; or one of the best answers, all the above or none of the above or not applicable.

This questionnaire for this research has included (33) questions in different formats and closed answers, for example multiple choice, yes/no format. All these questions are measured reediness, intensity and impact ICTs indicators. However, these questions were improved and updated based on the results of the pilot study.

4.6.1.1 Questionnaire Design

There are two questionnaires designed for this study, one for the staff and another for the manager. Copies of the surveys are included as appendices in English. The questionaries' used English. The academic staff questionnaires and medical staff questionnaires are similar and cover (e-communications, e-services, e-learning, e-scientific research, and e- sources) while, the managers' questionnaires cover (e-communications, e-services, and E-HRM)

Advice on designing the research questionnaires was drawn from Saunders (2011), who stated that there are two types of survey: those using closed questions, "which provide a number of alternative answers from which the respondent is instructed to choose' and those using open questions 'which allows respondents to give answers in their way." (Saunders. 2011, p. 292).
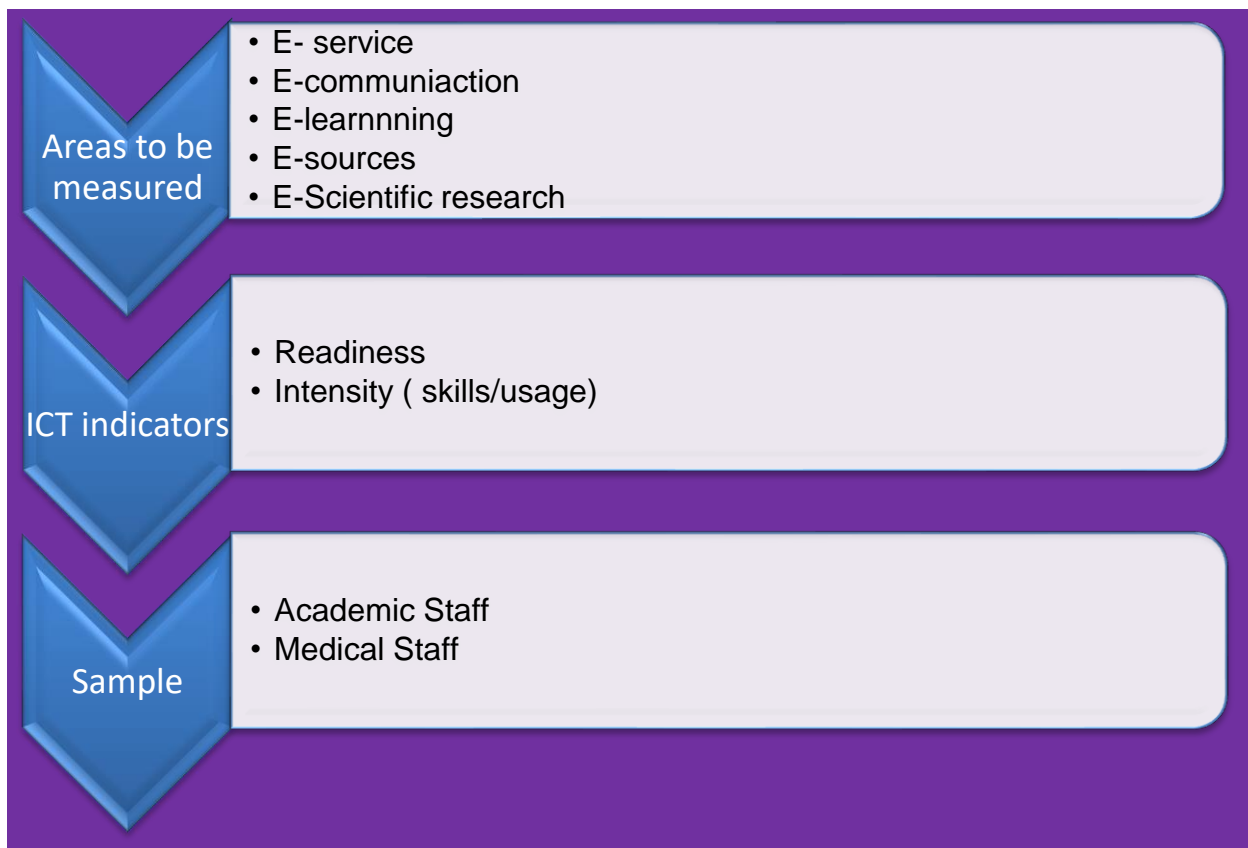
Figure 12: The area, ICTs indicators and Sample for staff questionnaires (Image by O. Alabdali).
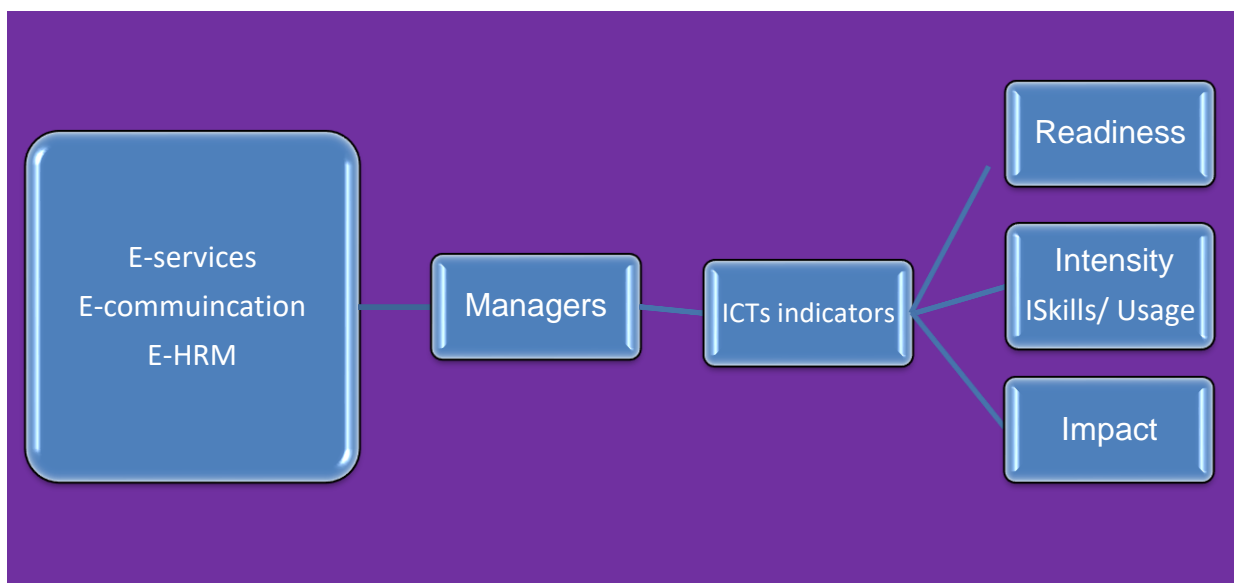
Figure 13: The area, Sample and the ICTs indicators for managers questionnaires (Image by O. Alabdali).

4.6.1.2 Staff Questionnaire

The staff questionnaire is divided into five parts. The first part includes the E-communication section, second part E- services section, third part E-learning

Then E- Scientific research, finally E-sources.

Each section includes a question to measure the readiness of the institutions regarding electronic systems and services. Also, to measure intensity (usage/skills) index, and to find out the staff abilities and skills in using the electronic systems and services and their level of usage.

The total number of questions in the staff questionnaire is (20) most of the questions are in YES /NO format, with two questions multiple choice.

The images below show the sections and the number of questions for each indicator and research sample.

All of the questions helped to meet all of the study objectives. And to answer research questions numbers 3-4 and 5.

E-Communication
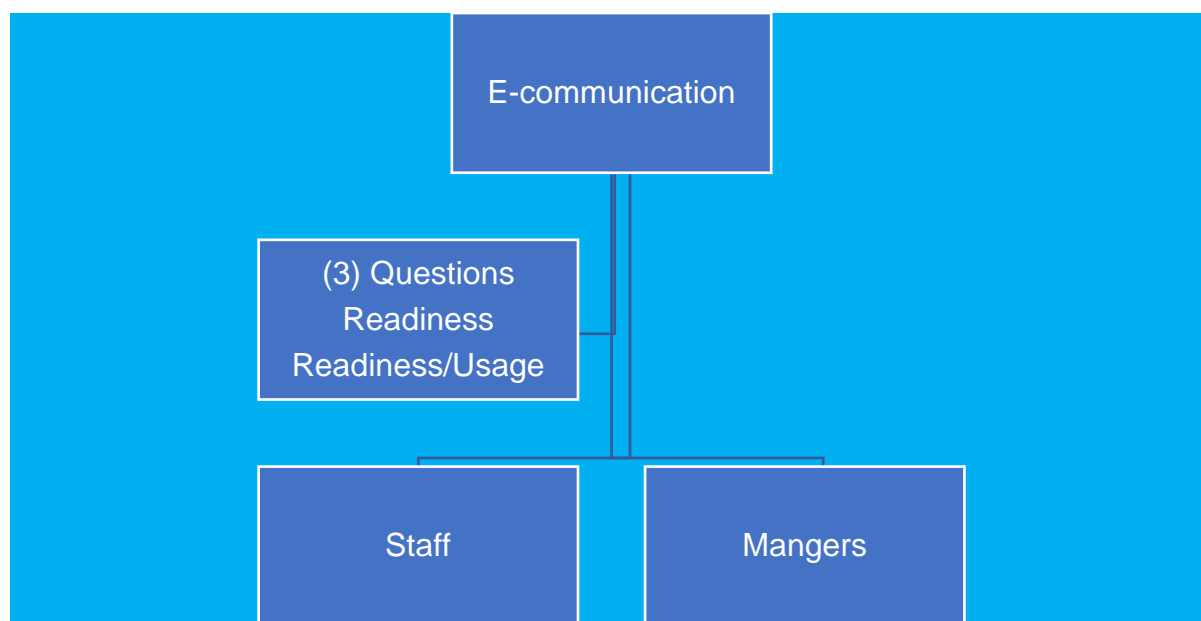
Figure 14: shows the section to be measured, the number of questions, the type of ICTs measurement indicators and the sample (Image by O. Alabdali).

E-Communication section includes two different type of ICTs indicator and the questions were for staff and managers.

Readiness indicator (Two) questions.

Usage/Readiness indicators (One) question.

E- Services
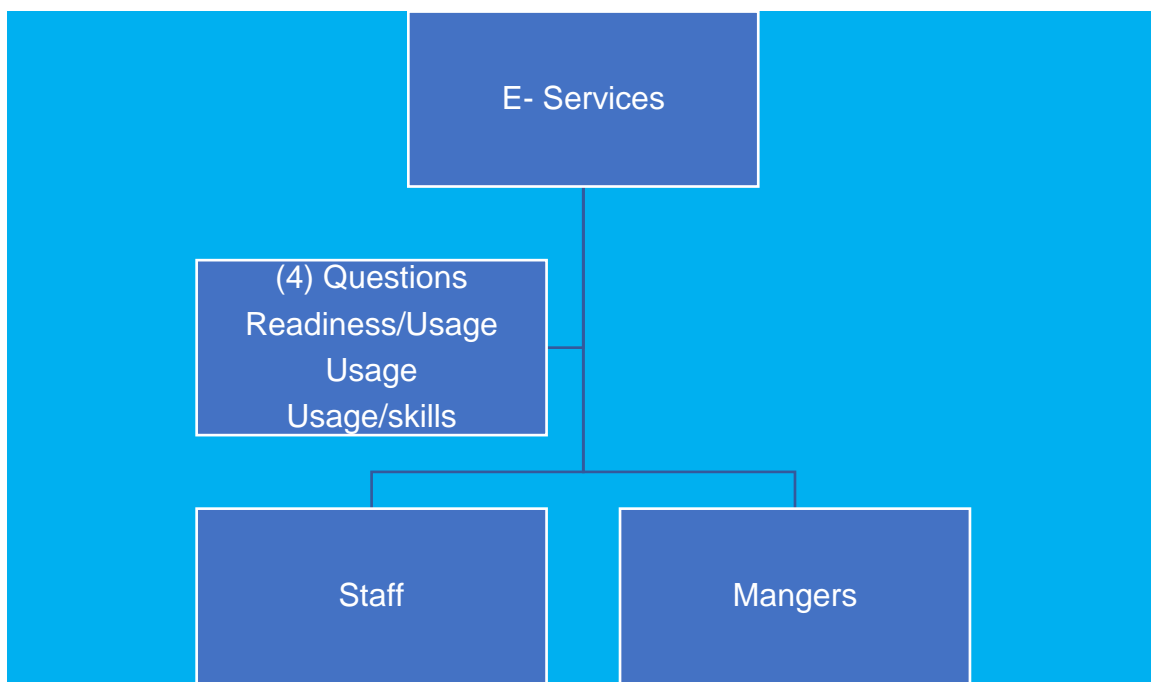
Figure 15: shows the section to be measured, the number of questions, the type of ICTs measurement indicators and the sample (Image by O. Alabdali).

E- Services section includes three different type of ICTs indicator and the questions were only for staff and managers.

Readiness/Usage indicators (Two) questions.

Usage indicator (One) question.

Usage/skills Indicators (One) question.

E-Learning
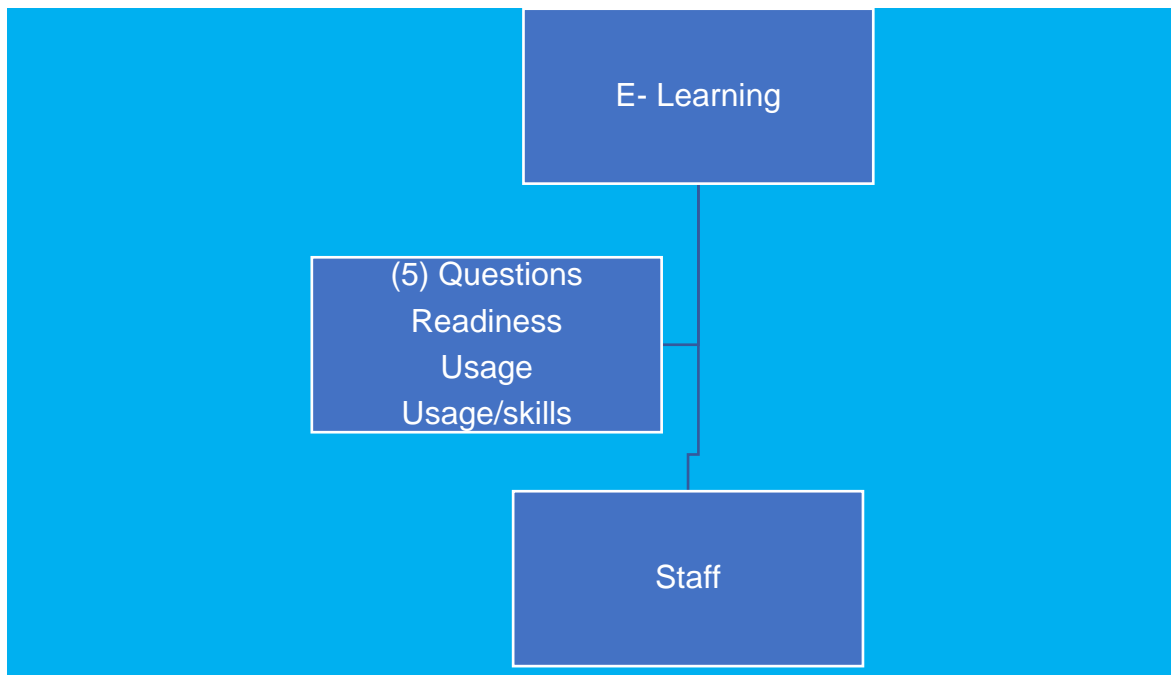
Figure 16: shows the section to be measured, the number of questions, the type of ICTs measurement indicators and the sample (Image by O. Alabdali).

E-Learning section includes three different type of ICTs indicator and the questions were only for staff.

Readiness Indicator (Two) questions.

Usage Indicator (One) question.

Usage/Skills indicators (Two) questions.

E- Scientific research
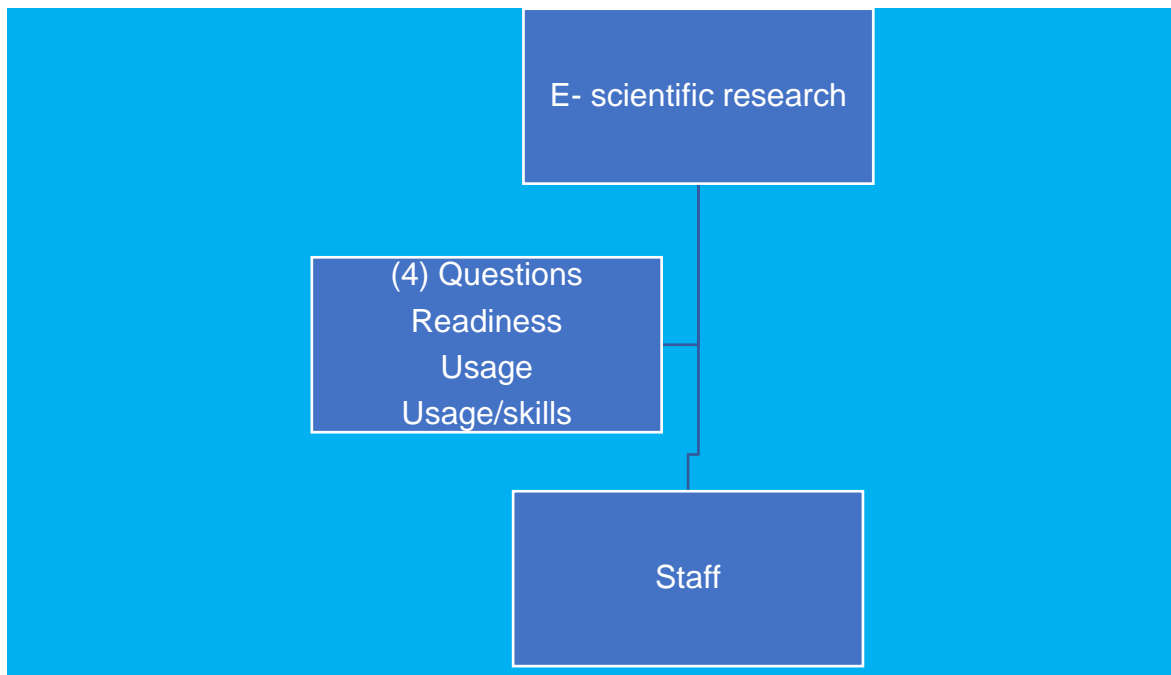
Figure 17: shows the section to be measured, the number of questions, the type of ICTs measurement indicators and the sample (Image by O. Alabdali).

E- Scientific research section includes three different type of ICTs indicator and the questions were only for staff.

Readiness Indicator (One) question.

Usage Indicators (Two) questions.

Skills indicator (One) question.

E- Sources
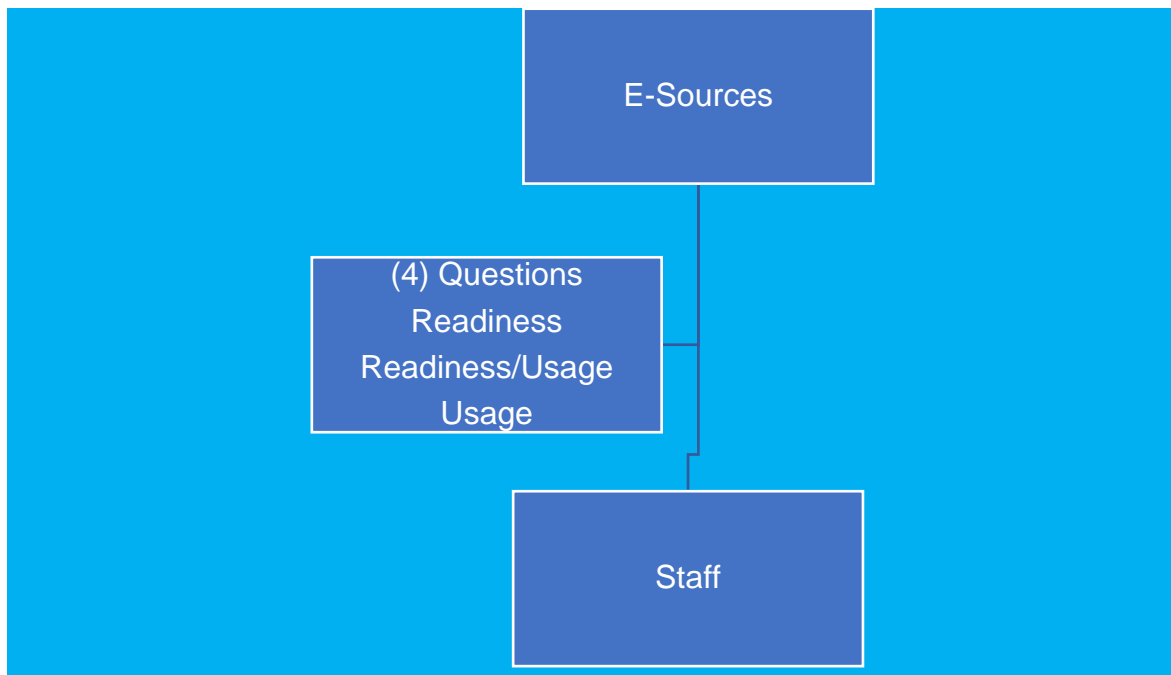
Figure 18: shows the section to be measured, the number of questions, the type of ICTs measurement indicators and the sample (Image by O. Alabdali).

E- Sources section includes two different type of ICTs indicator and the questions were only for the managers and questions were for the staff.

Readiness Indicator (One) question.

Usage Indicators (Two) questions.

4.6.1.3 Managers Questionnaire

The manager's questionnaire was divided into three parts. The first part includes the E-communication section, second part E- services section, third part E-HRM

The questions aim to discover the manager's abilities and skills at using the electronic systems and services and their level of usage. This part also includes questions that measure the willingness of Saudi managers to use new technology. It is covered to investigate the readiness of the electronic system within the insinuations. The last part of the questionnaire is related to E-HRM which measures the readiness of the institution, and the impact of shifting to an electronic system.

The total number of managers questionnaire are (Thirteen) questions.

All the questions helped to meet all the study objectives. And to answer research questions numbers 3-4 and 5.

E-HRM
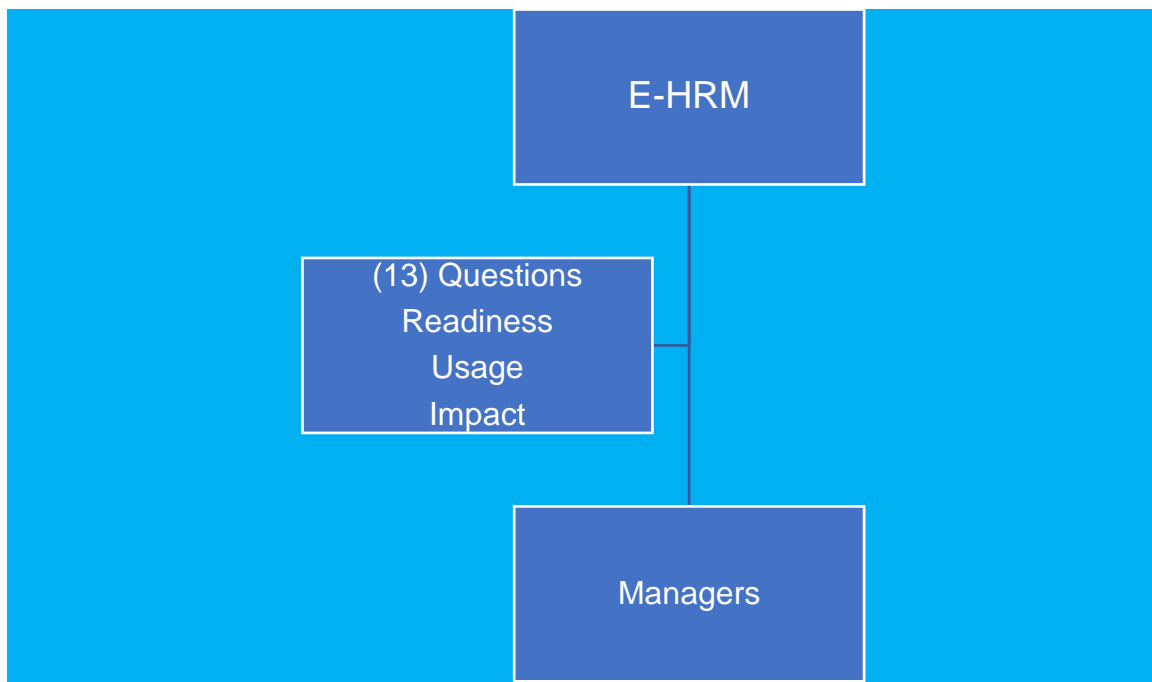
Figure 19: shows the section to be measured, the number of questions, the type of ICTs measurement indicators and the sample (Image by O. Alabdali).

E-HRM section includes three different type of ICTs indicator and the Questions were only for managers.

1- Readiness Indicators (Five) questions.
2- Impact Indicators (Seven) questions.
3- Usage Indicators (One) question.

At the end of the questionnaire, samples respondents have found consent questions that they were required to complete to give the researcher permission to use their responses. Nevertheless, if any consent question was found to be incomplete, the researcher has discarded the whole questionnaire.

Also, the researcher has provided her contact details in both her home country and the UK in case of an inquiry by the participants.

Finally, the researcher accepts that some of the data were not used. For example, when analyzing the results, if the researcher finds that some questions are non-descriptive for the study, the researcher will exclude the answers. This could be regarded as biased which was not the intention of the researcher, i.e., to deceive or misrepresent the participants (Babbie, 2010).

For analyzing data, the researcher has used SPSS computer software. This programmed has been used since 1960 and been developed over the years. This programmed is one of the most famous statistical analysis programmed for social scientists, mainly because it is easy to use (Meyers et al., 2013). However, this technique was used in the full study, as the pilot study is too small to show statistical significance.

4.7 Research Sample

A sample involves choosing some elements from the target population of the study, and also identifies it (Proctor, 2000; Kumar, 2019). It is important to choose the right size for the sample according to the time available, location and resources (Dean, 2004). Choosing the right population sample is a crucial element that should be considered for the success of the survey, not only as it helps achieve the research aims and objectives in a more convenient way, but, moreover, because it helps to study the population sample in more detail and with precision to reach more accurate results. According to Proctor (2000) claims that, a larger sample usually implies smaller sampling errors.

However, the researchers must take their time to carefully choose the right sample as the quality of the study is directly correlated to the success of the survey (Bernard, 2006). In this project, the sampling technique that used is the cluster sampling method, for which the population is divided into homogenous groups (in this case different universities and hospitals), then each group will be sampled separately in a random manner: academic/medical staff, employees and managers in both higher educational and health institutions.

- The questions were listed to satisfy the survey aims and reach the desired result.

- The method of approach is considered, for online questionnaire.

- The researcher identified the target population and choose the sample accordingly (Cohen, Manion and Morrison, 2011).

- The reasons behind targeting staff and managers at medical and educational institutions as the sample of this research is as follows:

- The researcher chose to sample the staff from public universities and hospitals located in all areas of the Kingdom cities to cover all the available variables found in the population, and to allow the outcome to be accurate and generalized;

- Saudi employees are the key element for helping the whole of society to become an information society. They also understand that the importance of communication and information technology in general in the current era is very important for the long-term growth of the country. Thus, they would have a background understanding of the subject and this will help them to tackle the question in a more reliable way and help the researcher to reach the desired outcome;

- The staff and managers at the higher education and health institutions have knowledge about the importance of information technology and how it will help Saudi to become an information society.

All these reasons also correspond to the research sample in the UAE and the UK in one way or another.

However, the quality of the results starts to negatively correlate with the number of the participants at one point. A study by Mason (2012) shows that, as the sample becomes very large, responses start to become very similar and the extra information will be useless.

The sample of this research around (1393) participants, each participant has provided a different point of view, however when the researcher started to notice similar responses being given to her, the data collection process was stopped. According to Mason (2012), most of qualitative studies generally are guided by saturation in terms of the number of responses while this research focuses on the data rather than the number of samples.

4.8 Countries for Comparison

The researcher chose to survey individuals from three countries: Saudi Arabia, the United Arab Emirates and the UK. These individuals will be composed of university policy makers, academic members and medical staff from different departments at the universities and hospitals. The researcher chose the UAE and the UK to be compared with Saudi Arabia for the following reasons: ITU (2016) and OECD (2012) reports show that the UAE has an advanced position with regard to becoming an information society compared to neighboring Arab countries having the same resources, for example, Qatar. Meanwhile, the UK is also considered to be a developed country with regard to its status as an information society.

4.8.1 Institutions in Each Country

The researcher had initially traveled back to Saudi Arabia after adjusting the questions based on the results of the previous pilot study, not only focusing on the informatics department but running a full study at all the various departments. The data for survey questionnaire gathered from educational institutions in Saudi Arabia include King Abdelaziz University (Jeddah), King Saud University (Riyadh), Tabak Universities (Tabak), University of Hail (Hail), AL Imam University (Riyadh) and King Fahd University (Damam). The data gathered from educational institutions in UAE include Al Ain University (al Ain), University of Dubai (Dubai), University of Sharjah and United Arab of Emirates (Dubai). Finally, the data gathered from educational institutions in U.K include UCL (London), Into City University (London), Kaplan University (London) and University of Westminster (London). With respect to medical institutions, the data was gathered from King Abdelaziz medical center (Jeddah), National guard hospital (Jeddah), National guard hospital (Riyadh), King Khalid hospital (Abaha) and National guard hospital (Tabak) in Saudi Arabia. However, in UAE, the medical institutions from where data was gathered include AL Baraha hospital, Zayed Military hospitals, Rashid Hospital and Latifa hospital. Finally, the data gathered from medical institutions in UK include New Victory hospital (London), Cromwell hospital (London), Princess Grace Hospital (London) and St Mary's hospital (London). of King Abdul-Aziz in Jeddah. These three universities were chosen because they represent the largest public universities in Saudi (King Abdul-Aziz University in Jeddah, King Saud in Riyadh and King Fahd in

Dammam). All these universities are finding by the Saudi government. With regard to hospitals in this research, they will be from different governances in Saudi.

After conducting the full study in Saudi, the researcher had travelled to the UAE then to UK.

After all the data has been collected from the three countries, the researcher started to analyze the results from each country and   compared the results in order to meet the research aim and objectives. However, the researcher must be aware that this field is constantly developing, and questions should be adjusted accordingly, and all annual publications from the international organization that provide ICT indicators in this project must be read and analyzed as soon as they are made available.

The data was gathered from staff and Mangers from different department in each Institution in all the three chosen countries. The reason behind choosing these institutions (educational and medical) from Saudi Arabia and from the UAE was that they were the biggest in respective cities. In the UK, a convenience sample was taken, from institutions of varying size and nature in the London area, to which the researcher had ready access.

Though the main focus of the research is on transition of information society in Saudi Arabia, however, other advanced countries were used to compare the outcome of the responses. The questionnaire surveys were emailed to the participants of the study in chosen institutions in all the three countries. The respondents filled the questionnaires and returned it back in two days. However, in Saudi Arabia, the researcher had also mailed the online questionnaires which took more time to response than the allocated time due to which the researcher later chooses to submit the questionnaire hand to hand in the UAE and U.K. Moreover, the researcher chooses the staff from different departments in each institution to make sure that accurate results are gathered. However, the sampling was done on random basis, i.e., people from all age brackets and gender was included in the study. The consent from the management of each institution was obtained to ensure that there remains any issue in future or while obtaining data from the participants. The data obtained from questionnaires were codified and were used for analysis. Cross tabulation was used to compare the data for medical and educational institutions in all the three countries.

4.8.2 The Reasons for Choosing the Educational and Health Sectors

There are some reasons for choosing to measure the development of education and health sectors in Saudi Arabia as an information society. According to Ogbimo (2010), the most visible area where transformation is first noticed is in the educational sector through the changes that consistently happen in teaching methods because of using new technology. In modern societies a social and economic approach is based on knowledge, thus mainly invest in human capital which raises the importance of inventing a new approach to education and training. Based on the importance of human capital in an information society, this research will focus on how individuals in this sector play a role in the information provided, whether they provide, analyze or access this information. According to a report by UIS (2009), by using information and communication technology in the educational sector there will be easier access to educational material for all the individuals in the society; it will also will raise the quality of educational resources and make the society more productive, leading to the transformation of the whole country into an information society. Information societies are societies that are concerned with producing information and publishing it.

To conclude, this research will use ICT indicators to measure the ICT infrastructure, for example, the abundance of computers and the quality of the Internet. The second indicator that will be used is the quality of education and health services, as the plans that are undertaken by the policy-makers focus on improving it (ICT outcome indicators). There are also other indicators that will be used in this project, such as skills, usage, intensity and impact indicators, which are explained in detail in the following section. The reason behind choosing the health and education sectors is that they are considered as most developed sectors in the country.

There are clearly several reasons for the researcher to focus on the education and health rather than other sectors, and they may be summarized as follows.

Firstly, the education and health sectors are the most suitable sectors for representing the Saudi process of transformation into an information society, and they reflect the Saudi national plan to transform the society into an information society.

Secondly, sectors are considered some of the most advanced sectors regarding the use of ICT technology in their fields. Also, these two sectors are the largest sectors in Saudi and represent most staff and employees found in Saudi.

Choosing these sectors allows the researcher to measure some aspects or topics that can be difficult to measure in other sectors, for example, scientific research and electronic libraries. Most of all they include different departments and allow the researcher to collect and reach a specific and accurate result.

4.9 Research Ethics

Consideration of ethics is an important part of any kind of research. monitors the research to reach a high ethical standard, practically protect the participants' privacy (Sieber, 2012). The researcher acquired ethical approval from the School of Informatics at City University of London. Each participant was given a short and brief introduction to the study purpose and aim and gave consent to participate; consent was also acquired from the heads of department in the participating universities for sharing the data collected for research purposes only.

There is no disclosure of participants' personal details in any part of the project and they remained anonymous, and no quotes from any participant interview were used without approval from the owner. A copy of the brief introduction paragraph for the overview and aim of the paragraph given to students before any data was collected is included in the appendix. As the research was carried out in three different countries, the ethics form is divided into three forms, each form was allocated to participants in one of the three countries, as it must be considered that every country will have different ethics with regard to research.

The researcher must be honest when transferring the data, and avoid any bias so far as possible, and must respect all responses from participants whether they are with or against the researcher's point of view. All the ethical issues in the project are covered by the higher education requirements in each of the three countries. The researcher has also received the ethical formal approval from the School's ethics committee.

4.10 Confidentiality

(Lowrance, 2012, p.15) defined, confidentiality as "the individual right to rely on or trust the other and the right to access private information." However, as mentioned above, the researcher has not disclosed personal details of any participants, the respondents were also ensured that their names not be disclosed. Also, the researcher has transferred the exact answers regardless of whether they agreed with them.

4.11 Summary

In this chapter, the researcher explained in detail all the methods available to explore this study including qualitative, quantitative and mixed methods. Furthermore, the researcher explained the reason behind choosing the mixed method, over the other options. The researcher then moved on to explain the ICT indicators used in this project in detail. The research framework was also outlined in this chapter, which was a mixture of both Webster's and Gardin's framework to produce a new kind of framework that can be used to achieve the aim of the research more accurately. Also, the method used to collect the required data was explained in detail in this chapter along with the survey sample and the countries used in the study.

The institutions used in the study were also outlined in this chapter to help the reader understand further the data collection process along with the research ethics. The following chapter includes the pilot study and the results of the pilot study as well as the conclusion of the pilot study.

Overall the primary purpose of this project is measuring the Saudi information society by using ICTs indicators that are designed by Gardin (2002) (Readiness, Intensity, Impact and Outcome). These categories are flexible, and any can be altered to fit into any specific research, and are used by international bodies, specifically ITU, in two areas specifically mentioned by Webster: technology and occupation. These were focused in two sectors: education and health. The indicators were edited to help the researcher to reach the desirable result. The indicators that the researcher used has covered these four fundamental areas mentioned above.

The next chapter is the pilot study. When the questionnaires had been designed, all questions were evaluated by using pilot study. A pilot study is fundamental for any questionnaire to assess how respondents understand each question.

The following diagram (Figure 20), shows the inter-relation of the phases of research, and the methods used at each stage.

Research Phases

Phase 1 Literature
- English+Arabic sources+International Reports
- To compare the Saudi society with other societies (UK and UAE).

Phase 2 Pilot Study
- Information services department Saudi
- King Abduallazizi Uni +Dar AlHakmi Uni
- Online Questionnaire
  - Use ICTs Indicators
  - Information services Staff
  - Need to adjust questions
- Interview
  - Use ICTs Indicators
  - Policy Maker
  - Responses did not meet study gols
- 1- Interview approach discontinued
- 2- Scope of study amended
- Met first Objective measure the willingness of Saudi people in using new technology

Phase3 Main Study
- Education+Health sectors KSA,UAE,UK (Universites+Hospitals)
- Online Questionnaire
  - Use ICTs indicators
    - Staff
    - Ther are services but not the required level and the interaction is weak
  - Use ICTs
    - Managers
    - The services provided are better and more used
- 1-Saudi is in the third place but with increased training and improved sevices quality will improve its position
- 2- Medical sector is better than Education
- Met all study Objectivies
  - 1-Meausre Saudi as Information Society in spesific sectors
  - 2- To measure the willingness of saudi people in using new tecnology
  - 3-Compare Saudi society with UK and UAE societies
  - 4- Provide a new aprroach to measure Information society

Figure 20: The phases of the research (Imaged by O.Alabdali).

Chapter Five

Pilot Study

5.1 Introduction

This chapter describes a pilot study to test the viability of the measuring approach created by the researcher.

5.2 Pilot Study

In this stage of the project, the researcher had to run a pilot study. This term refers to taking a small proportion of the sample to identify if the research is useful and should be carried out again with a larger sample (Blessing and Chakarbarti, 2009; Kumar, 2019). The researcher undertook a pilot study on a small sample in Saudi Arabia to ensure that the research leads to productive results before conducting it on a larger scale.

This pilot study is necessary for two fundamental reasons; firstly, the study was conducted in three countries, so it is essential to ensure that all questions are valid. Because it would be difficult to adjust the questions at a later stage as the researcher will not be able to afford to return to a country, to undergo the research after correcting any mistakes. Secondly, the survey consists of interviews and a questionnaire, making it very important to update all questions before running the full study. At the end of the chapter (5) the researcher has explained if these methods are suitable for collecting the data in the main study.

5.3 Collecting Data approach's

There were two data collection approaches used by the researcher to gather data for this study.

5.3.1 Face-to-face Interview

For the social survey, the individual face-to-face interview is considered the most accurate method; however, it comes with both advantages and disadvantages; Face-to-

face interviews help the researcher to accurately choose the right sample to meet his/her objectives and facilitate faster responses thus saving time.

On the other hand, it may be costly, but the researcher may also be encouraging based results by either influencing the answers of the sample or creating misleading results since the research is concerned with 'perceptions,' a qualitative approach must be used (Cohen, Manion and Morrison, 2011). Additionally, as the researcher is part of the research, he/she becomes an insider (Yin, 2009; Kumar, 2019).

To achieve the best results for answering the research question, it is essential for the researcher in this project to use personal interviews as an information approach for collecting data. In this research, the interview was structured into five questions. However, the researcher might need to change the interview questions many times to achieve the best results. The researcher had some difficulty throughout the interviews as, for example, sometimes the participants did not understand the questions, or they needed some help, so the researcher had to explain some questions for them which affected their answers (Yin, 2009).

The interviews were started by getting some background information about the participants such as what it is they study, where and at which university, and their age. This has allowed the participants to feel free to answer the questions; interviews, in general, took around 20 to 30 minutes. The researcher had sent a request to the head of the information science department in each university for the pilot study which took place in Saudi asking for permission to interview the staff and policy-makers in that department and this involved six participants.,

The request letter was sent before the researcher arrived at these universities.

Ten minutes were used to give a brief introduction of the aim of the study, as all the participants are experts in this field, making it easier for them to understand the research concept.

Twenty minutes used for undergoing the interview.

Ten minutes for further questions from the participants, also the researcher will provide contact details for future inquiries.

The researcher had provided information sheets for participants whether they were asked to take part in an interview or to complete a questionnaire. When participants agreed on participating in the research, they were provided with a consent form that should be signed, and they were informed that they could withdraw from participation at any time without giving any reasons and they will not face any consequences. The participants were given time to ask any questions regarding the research before signing the consent form; For the email questionnaire, the researcher had provided full contact details including a Saudi mobile number that also works in the UK with no extra charge.

There are three methods of gathering data for this project.

1) Readiness indicators: the researcher has collected the data by visiting the institutions as no data was found from the institutions' official websites. (King Abdelaziz University and Dar Al Hekma University) Both in Jeddah Saudi Arabia. Consists of 6 questions.

2) Intensity indicators were collected via an email survey. Consists of 8 questions.

3) Finally, the impact and outcome indicators were gathered via face-to-face interviews as the kind of data included personal points of view to provide a clear image of the topic. The way the researcher has got the data is by using open-ended questionnaires. These allowed the participants to speak fully on the subject. The researcher gave all participants the same survey to improve reliability (Prasad, 2001) but this may alienate them if the questions are not meaningful to them. Also, the researcher may have to explain the meaning of words but, in doing so, there may be some bias (Prasad, 2001). It consists of 3 questions of impacts and 3 of the outcomes.

5.4 Analysing Data

In this section, the researcher will analyses the results from both the questionnaire and face-to-face interviews. The email was sent to 20 samples in both King Abdul Aziz and Dar Al Hekma universities, where six face-to-face interviews took place in September (2013) in Jeddah, Saudi Arabia. The responses to questions were different from one person to another. However, the researcher had interviewed six people of different sex, age, and educational level. The researcher decided that the questionnaire should be in

the information section of two universities, one belonging to the government and the other to the private sector, and the sample of the research for the questionnaire only of the employees in this section and the personal interview only with the heads of departments in the two universities.

5.5 Analysing the Result

5.5.1 Readiness

Questions	King Abdelaziz University (Male)	King Abdelaziz University Female)	Dar Al Hikma University
Total Number of staffs?	20,000	15,000	600
Numbers of computers used for educational purposes?	20,000	15,000	600
Budget allocated to Information technology?	10%	10%	7%
Speed of the Internet connections?	50MB/s	50MB/s	10MB/s
Qualified IT staff?	70	50	15
Professor in department of Informatics	15	10	3
Professor for IT and Informatics Courses	3 (IT skills Information management, Information science)	3 (IT skills Information management, Information science)	1 (management, Information System)

Table7: Shows the questions and the results of Readiness for King Abdelaziz/Dar Al Hekma.

5.5.2 King Abdelaziz University

King Abdelaziz University is a public university funded by the Saudi Arabian government, with a budget of around 4 billion SAR (800,000,000 GBP); it has approximately 82,000 students (full time and part-time).

Q1 – Regarding the first question, the number of computers is reasonable as it is – there are approximately 40% computers for the total number of students in both male and female campuses (4 computer devices for every ten students).

Q2 – All computers are used for educational purposes in all departments.

Q3 – The budget is considered very low when compared to the budget and size of the university or the number of students. It is deemed to be low as it is divided into sub-parts: buying technology devices, supporting scientific research, maintaining academic research, promoting IS awareness.

Q4 – The speed of the Internet is considered very reasonable compared to the average rate in Arab universities.

Q5 – The IT staff and professors have a disappointing ratio when compared to the total number of students.

Q6 – The programmed related to IT are also a shallow profile for a public university, and there must be a more efficient role played in raising the awareness of IS.

5.5.3 Dar Al Hekma

Dar Al Hekma is an all-female private university, with around 1,500 students. Its budget is approximately 500,000,000 SAR (80,000,000 GBP).

Q1 – The number of computers is also reasonable considering the small number of students.

Q2 – All computers are used for educational purposes in all departments.

Q3 – The budget is considered fair for such a small institution.

Q4 – The speed of the Internet is considered reasonable as there is a small amount of traffic due to the small number of students.

Q5 – The staff working in IT departments are all fully qualified as this university requires high skills in both English and IT for recruitment.

Q6 – The University only offers one IT course which is not enough.

In conclusion, based on ICT infrastructure, both universities are considered to be well equipped, whereas the programmed are deemed to be very low in number, as universities are supposed to be the central institutions to aid society in transforming into an information society. Abdul Aziz University should be stricter in its recruitment process and choose more qualified staff in the IT department.

Regarding the university budget, it is essential to increase the budget, as it serves three main pivots needed by the country to go through a transition into an information society: investment in scientific research, acquiring the newest technology devices and conferences targeting IS awareness.

5.6 Intensity

Questions	Variable	Sources	Usage /Skill
Do you the internet?	Yes/No	Email Questionnaire	Usage
For what reasons you use the Internet?	Multiple Choice	Email Questionnaire	Usage
Average usage time?	Hours	Email Questionnaire	Usage
Required publication annually?	Yes/No	Email Questionnaire	Usage
Annual number of e-publication?	Number	Email Questionnaire	Usage
Skills of using the Internet?	Multiple Choice	Email Questionnaire	Skill
Using of e-communication?	Yes/No	Email Questionnaire	Usage
Using of e- submission?	Yes/No	Email Questionnaire	Usage

Table 8: Shows questions/variables/sources and types of Intensity indicators.

The researcher surveyed 20 samples from both universities: Abdul Aziz University and Dar Al Hekma provided 15 and 5 participants respectively.

5.6.1 King Abdul Aziz University

Q1 – All the 15 samples stated that they use the Internet.

Q2 – 5% stated that they use the Internet for academic information; these were all academic staff; 95% reported that they only use it for pleasure.

Q3 – They all use the Internet for 30+ hours a week.

Q4/5 – Only academic staff were required to publish annually; 15 research pieces were required each year.

Q6 – No publications were uploaded online from all the academic staff as there was no law protecting online publishing.

Q7/8– All participants stated that they never used electronic ways to communicate with other members nor submitted work online.

5.6.2 Dar Al Hekma

Q1– All 5 participants reported using the Internet.

Q2 – They all use the Internet for both academic information and pleasure.

Q3 – They also use the Internet for 30+ hours a week.

Q4 – There were no publishing requirements for any participants

Q5 – The average skills for using the Internet were very good as ICT skills are one of the entry requirements.

Q6 – All participants contacted other members online at least once using electronic means.

Q7/8 – electronic submission is not required in this university.

In conclusion, regarding the intensity indicator:

- A high percentage of the sample use the Internet regularly mainly for pleasure and checking their email.

- The number of people using the Internet for more than 30 hours a week was aged between 30 to 40 years, which proves that the samples older than 40 use the Internet less often due to having low IT skills.

- As Dar Al Hekma requires full IT and English skills, the average number of Internet skills was higher than at King Abdul Aziz University.

- Dar Al Hekma allows its students to use Internet sources as academic sources, whereas in King Abdul Aziz University, it is not permitted.

- In King Abdul Aziz University, even though e-publishing is a requirement, nobody uploads their work online.

5.7 Impact

Questions	Variable	Source
Factors limiting using the Internet as an academic source	None	Face-to-Face
Steps required to raise awareness of information society	None	Face-to-Face
Why is it important for Saudi to become an Information society?	None	Face-to-Face

Table 9: Shows the question/variables and source for Impact Indicators.

The researcher interviewed the policy makers in both universities, four in King Abdul Aziz University and two in Dar Al Hekma University.

5.7.1 King Abdelaziz University

Two of the interviewed were executive directors while the other two were academic staff in the IT and Informatics department.

The First Participant

Q1 – Lack of copyright laws protecting authors in Arabic society.

Q2 – Holding free conferences in the university and sending staff to take part in these events, either locally in Arab countries or abroad.

Q3 – It is the primary way to improve the educational sector through new technology and interaction with other cultures.

The Second Participant

Q1 – Lack of awareness of the importance of the Internet as an academic source.

Q2 – Holding free conferences in the university and sending staff to take part in these events, either locally in Arab countries or abroad.

Q3 – It will help Saudi become a developed country.

IT and Informatics Staff

The First Participant

Q1 – There is no experience in using the Internet as a source amongst staff.

Q2 – Teaching subjects related to the information society in more depth.

Q3 – To deal with other societies where the information society is very developed.

The Second Participant

Q1 – Lack of ability in using the Internet and the new technology.

Q2 – Universities should start introducing software to detect plagiarism to help increase the quality of student and academic research.

Q3 – Because the future is within the information society.

5.7.2 Dar Al Hekma University

The First Participant

Q1 – No regulations on the quality of information online.

Q2 – This University is not taking any action to raise awareness, but they will start to increase the number of programmed taught relating to IT and informatics.

Q3 – For improving the standards of living.

The Second Participant

Q1 – Lack of reliable sources in the Arabic language.

Q2 – Agreements with other universities to cooperate in the ICT field.

Q3 – Because ICT has become an indicator to measure how developed a society is.

In conclusion, the lack of skills and expertise in using the Internet is one of the primary motivations for Saudi to become an information society; lack of reliable data in the Arabic language makes the Internet a minimal academic source. The programmed taught must be increased to build a foundation for an information society. All participants believe that becoming an information society is vital to improve people's lives as it would improve society at every level.

5.8 Outcome

Questions	Variable	Source
Effects on rates of unemployment by becoming an Information society	None	Face-to-Face
Effects on productivity by becoming an Information society	None	Face-to-Face
International competitiveness With becoming an Information society?	None	Face-to-Face

Table 10: Shows the question/variables and source for outcome Indicators.

5.8.1 Outcome results

Q1– Two out of the six participants stated that it would negatively affect the unemployment rate, as a high number of people in the society still have no background or experience in the usage of IT. while the other four pointed out that, it would be beneficial because everyone would start to learn using the new technology. And the Internet to compete for a job.

Q2– They all agreed that becoming an information society would directly increase the productivity of the population and this would directly help in the development of the economy.

Q3– They all agreed that by becoming an information society, it would make Saudi more competitive in the international market as it would be able to export output that it was not able to before.

5.9 Conclusion

The result of this pilot study gives the researcher a better idea about measuring information and shows the strength and weakness of the research method; clearly, both data collection approaches were tested. So, it is helped the researcher to improve the research methodology. This was in terms of amending the questionnaire questions or dispensing with the personal interview and amending the scope of the study in that it needed to cover more sectors of the information society such as e-HRM, e-learning and some more. However. The researcher conducted two methods to collect data. The first method was the questionnaire, and the other one was individual interviews. Both approaches have advantages and disadvantages explained previously in the chapter (4). Therefore, this section will focus on the two methods of this research and the reasons that made the researcher abandon the process of individual interview.

First, the researcher has distributed the questionnaire to 20 people in the two universities, and the results were useful but limited. However, through this pilot study, a useful approach was identified to collect data to reach the study objectives.

 To begin with, the questionnaire which included two sections covering two ICTs indicators of measurement (Readiness- Intensity).

The first (Readiness Index) was designed to assess the status of the university in terms of the number of computers and faculty members and curricula. It was later found that these points were not necessary for the search results and the goals of the study, so they were excluded from the main study.

The second (Intensity indicators) cover Usage and Skill. They intensity included (Six) questions for usage and (One) for skills. (Three) Questions related to the Internet, with (Two) questions about the dissemination of scientific research, and the final (Two) about the use of e-services and the method of delivery of research. However, in the main study, the researcher removes questions that related to the internet and replaced them with questions about e-services and e-communication. Also, the questions of scientific research were given a separate section.

On the other hand, the individual interviews covered two ICTs indicators of measurement. Both included (Three) questions all measuring the impact and the outcome.

In terms of the impact question, one was about the internet the second was about the steps necessary to raise the awareness of information society. The last was about the importance for Saudi to become an information society. The outcome questions were about the effect on the unemployment rate. The second question was on the impact on productivity, and the last one was related to competitiveness.

Although interviews are one of the most important sources for qualitative studies (Yin, 2009), the interviews section was dispensed on the primary research for several reasons.

1- The questions did not reach the research goals.
2- Most important reason was that the results were disappointing, and the researcher was unable to link to convincing answers or answers that could reach the research objectives. Also, there were difficulties in gaining cooperation from the sample, and this may be because this type of sampling reached mainly directors of the departments. They seemed fearful of the personal interview. So, their answers were more diplomatic than convincing answers.

Moreover, this may be because they do not want to criticize the policies of the state, especially since the sample is small and it is possible to distinguish its members despite the commitments made by the researcher on the confidentiality of information.

1- The sample was considered very small. Therefore, only suitable for the pilot study of the project.

Nevertheless, it still gives an overview of the views of the surveyed population relating to this matter, and of the validity of the indicators and questions used, so later that necessary change in the main study. It is clear that it was easy to collect the data for the readiness indicator, whereas the indicators related to intensity, impact, and outcome needed more open-ended questions.

5.10 Limitation

There is still one massive limitation about this pilot study that is the low number of samples surveyed. Another limitation is that this research will be conducted in the English language, which may not be the first language for most of the participants, which may lead to inaccurate responses from gaps in translations. Nonetheless, the pilot study served its purpose, in demonstrating the validity of the method, and in suggesting necessary changes for the main study.

5.11 Summary

In this chapter, three indicators were used as a pilot study, i.e., readiness indicators, intensity indicators, and the impact and outcome indicators, the information was gathered through face-to-face interviews where open-ended questionnaires were used to get a clear image about the topic. The researcher tested the ICT approach using a pilot study; the feedback was then used to improve on them and to make them more suitable for more significant research, i.e., questionnaire survey. The outcome of the pilot study revealed that fewer respondents agreed that information society negatively affects the unemployment rate. Moreover, all the respondents were in favor of becoming an information society to directly increase the productivity of the population which will help in the development of the economy. Lastly, the participants agreed that becoming an information society will make Saudi Arabia more competitive in the international market. However, the results indicated that the scope was not large enough to provide

reliable results. Therefore, the researchers adjusted the approaches accordingly to help the researcher tackle all the objectives of the research accurately. The next chapter is the results and dissections of the Main Study.

Chapter 6

Main Study Results

6.1 Introduction

This study involved surveys with academic/medical staff and managers of hospitals and university institutions within the UAE, UK, and Saudi. From 1500 questionnaires distributed within KSA, 780 participants responded, 400 out of 800 participants within UAE returned, whereas in UK 213 out of 300 participants responded to the survey. Table (10) represents the distribution of participants into managerial and academic/medical staff across Saudi, UK and UAE.

The chapter is divided into four main sections:

1- Medical staff questionnaire results analysis.

2- Academic staff questionnaire results analysis.

3- Medical managers questionnaire results study (Include HR department).

4- Academic managers questionnaire results analysis (Include HR department).

5- The results of E-HRM are not divided into medical and academic since the results were very close.

6- The research includes managers from human resources departments to measure the E-HRM in hospitals and universities. As it is intended to evaluate departments and institutions, results from managers and staff in all departments, not just HR, are included.

Also, it is necessary to be aware that the analysis of the result was done in two ways

1- Analysis of the results from all three countries to meet the third objective.

2- Analysis of the finding of Saudi by the ICTs indicators to meet the first and second objectives.

6.2 Presentation of Results

This section analyses and discuss the results obtained from the sample, such as; Percentages of participants from each institution. Average professional position, followed by the separate discussion of results of academic /medical staff and managerial staff of UAE, UK, and Saudi. Finally, the results will be discussed in reference to the literature.

All the institutions had different departments and most important consideration as they use advanced technologies in their systems and their staff has the knowledge of the information technology systems. Total 1500 questionnaires were distributed within KSA out of which 780 participants responded. Total 800 questionnaires were distributed in UAE where 400 participants have respondent. Lastly, 300 questionnaires were distributed in the UK where only 213 participants have responded.

	UAE	Saudi	UK
Questionnaire distributed	800	1500	300
Responses Obtained for questionnaire	400	780	213
Unreturned questionnaire	400	720	87

Table 11: The number of questionnaires distributed, responses obtained for questionnaire and unreturned questionnaire.

6.2.1 Percentage of participants from each institution.

SAUDI

Medical insitiation Saudi	Staff 247	Managers 190
King Abdelaziz medical center (Jeddah)	% 22,26)people 55)	% 15,26)people 29) HR Department (5)
Nattional guard hospital (Jeddah)	24,29%)people 60)	% 23,68)people 45) HR Department (15)
Nattional guard hospital (Riyadh)	26,31%)people 65)	% 28,94)people 55) HR Department (15)
King Khalid hospital (Abah)	17,00%)42people)	% 14,73)people 28) (6) HRDepartment
Nattional guard hospital (Tabak)	% 10,12)people 25)	% 17,36)people 33) HR Department(9)

Table 12: The percentage represents the distribution of participants for medical staff and managerial across Saudi.

Acadmeic insitation Saudi	Staff 213	Managers 130
King Saud univesity (Riyadh)	22,06%)47people)	20,76%)27people) HR Department (8)
King Abdulaziz University (Jeddah)	20,65%)people 44)	16,15%)people 21) HR Department(6)
Tabak University (Tabak)	7,98%)17people)	11,53%)15people) HR Department(4)
University of Hail (Hail)	11,73%)people 25)	6,92%)people 9) HR Department (2)
Al Imma University (Riyad)	25,82%)people 55)	36,15%)47people) HR Department(12)
King Fahad University (Dama)	(25 people) 11,73%	8,46%)11people) HR Department (3)

Table 13: The percentage represents the distribution of participants for academic staff and managerial across Saudi.

UAE

Medical insitiation UAE	Staff 140	HR Managers 65
AL Baraha hospital	23,57%)33people)	% 23,07)people 15) HR Department (1)
Zayed Military hospitals	43,57%)61people)	% 44,61)29people) HR Department (2)
Rashid Hospital	% 19,28)27people)	% 21,53)14people) HR Department (3)
Latifa hospital	13,57%)19people)	% 10,76)7people) HR Department(1)

Table 14: The percentage represents the distribution of participants for medical staff and managerial across UAE.

UAE

Acadmeic insitation UAE	Staff 110	HR Managers 85
Al Ain University (al Ain)	30.00%)33people)	20,00%)17people) HR Department (2)
University of Dubai (Dubai)	35,45%)39people)	27,05%)23people) HR Department(3)
University of Sharjah	24,54%)27people)	37,64%)32people) HR Department (4)
United Arab of Emirates (Dubai)	10,00%)11people)	15,29%)13people) HR Department(1)

Table 15: The percentage represents the distribution of participants for academic staff and managerial across UAE.

Medical insitiation UK	Staff 53	HR Managers 64
Cromwell hospital (London)	47,16%)25people)	53,81%)37people) HR Department (4)
New Victoria (London)	32,07%)17people)	23,43%)15bpeople) HR Department(3)
Princess Grace hospital (London)	18,96%)11people)	18,75%)12people) HR Department(2)

Table 16: The percentage represents the distribution of participants for medical staff and managerial across UK.

UK

Acadmeic insitation UK	Staff 58	HR Managers 38
UCL (London)	25,86%)15people)	26,31%)10people) HR Department (3)
Into City University (London)	13,73%)8people)	10,52%)4people) HR Department(1)
Kaplan University (London)	15,51%)9people)	18,42%)7people) HR Department(2)
University of Westminster (London)	32,75%)19people)	44,73%)17people) HR Department (5)

Table 17: The percentage represents the distribution of participants for academic staff and managerial across UK.

The overall results reveal that staff administration was heavily represented the demographic profile. On the contrary, the representation of managers was lower. This could be linked with the fact that mangers are usually less in number than the staff in organizations.

Saudi	UAE	UK
Female 36%	Female 20%	Female 31%
Male 74%	Male 80%	Male 69%
Managers 4% female 96% male	Managers 2%female 98% male	Managers 2% female 98% male

Table 18: Sample position of participants in medical field in KSA, UAE and UK.
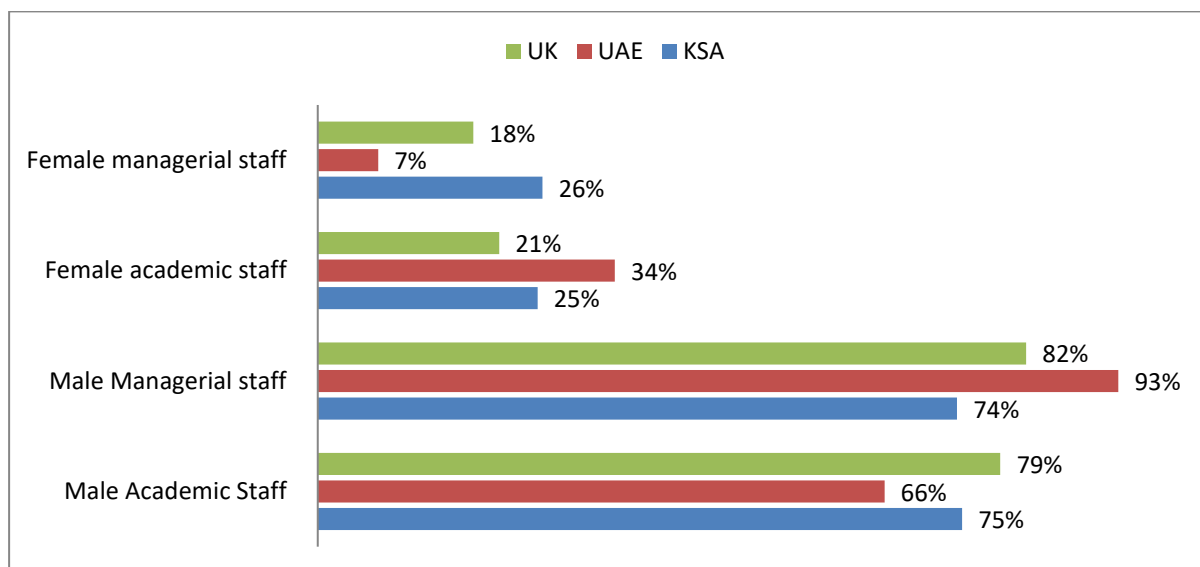
Figure 21: Sample position of participants in academic field in KSA, UAE and UK.

As far as professional position (Figure 20) of participants is concerned, there is similar percentages of academic and managerial in all three countries, i.e., female staff (25%) in Saudi and UAE (34%) and (21%) in UK. However, there is (93%) mall managerial staff in UAE, (74%) in Saudi and (82%) in UK. Moreover, there is (66%), (75%) and (79%) male staff in UAE, Saudi and UK respectively.

1- The results reflect that there is a higher tendency of the male working population in all three countries.
2- The result shows that KSA has more female managerial staff than in the other two countries.
3- The results were showing a greater ratio of male managerial staff in the UAE.

6.3 Results of survey with medical/academic staff

6.3.1. E- communication

E-Communication refers to electronic communication is not only new way approaches for communication inside the institutions it also a new way to communicate with the customer and users. (Barnes, 2005). In modern information society, e-commerce lies at the center of it.

Questions	Indicators	KSA	UAE	UK
Q1-Does the institution provide an email account?	Readiness	(50%) Yes (50%)　No	(97%) Yes (3%) No	(100%) Agreed
Q2-Are the institution email accounts provided considered to be a formal method of communication?	Usage/Readiness	(53%) Yes (47%)　No	(76 %) Yes (24%) No	(100%) Agreed
Q3-Are institutions provide different ways of electronic communication?	Readiness	(81%) Yes (19%) No	(80%) Yes (20%) No	(80%) Yes (20%) No

Table 19: Represent questions, ICT indicators and medical staff results in KSA, UAE and UK for E-communication.

6.3.1.1 Medical staff Results

Q1-The results show that the respondents of UAE believe that most of the institutions provide an email account, (97%) Yes and (3%) No. Concerning Saudi, only half of the institutions offer an email account to their employees reflected by (50%) Yes and (50%) No. While the respondents of the UK show that all the institutions in the UK provide its employees with an email account (100%), this result indicates that there is a weak point in electronic communication systems in Saudi. They are considering the importance of emails. However, that could be due to the fact that there are no rules set yet for using emails in Saudi government institutions. However, for any policy to be effective, the

policymakers in Saudi must enforce it fairly and consistently by providing training for employees on the institution email policy.

Q2- In UAE, more than half of medical staff agreed that the institutions provide their staff with an email account for formal communications reflected by (76%) Yes and (24%) No. Additionally, the institutions in Saudi also provide their staff with an email account for official emails reflected by (50%) Yes and (50%) No. On the other hand, In the UK the staff is also provided with an email account for official emails indicated by (100%) Yes. This result is related to the result of the first question as the governmental institutions in Saudi Arabia do not provide an email account to employees. It is normal not to use the e-mail as a formal way to communicate; However, the reasons for the lack of effective use of e-mail in Saudi Arabia could be maybe due to 1- the lack of equipment, 2- the lack of knowledge of the use of technology. In fact, in Saudi, the telephone or fax is the usual way of communication.

Q3- Lastly, the institutions in Saudi provide different ways of electronic communications reflected by (81%) Yes and (19%) No. The UK and UAE institutions provide different ways of electronic communications reflected by (80%) Yes and (20%) No. Surprisingly, the ratio in institutions in Saudi Arabia is higher than those in the UAE and UK.

Questions	Indicators	KSA	UAE	UK
Q1-Does the institution provide an email account specifically for E-communication?	**Readiness**	**(8%) Yes** **(92%) No**	**(100%) Yes**	**(100%) Yes**
Q2-Are the institution email accounts provided considered to be a formal method of communication?	**Usage/Readiness**	**(8%) Yes** **(92%) No**	**(87%) Yes** **(13%) No**	**(100%) Yes**
Q3-Are institutions provide different ways	**Readiness**	**(91%) Yes** **(9%) No**	**(43%) Yes** **(57%) No**	**(100%) Yes**

of electronic communication?				

Table 20: Represent questions, ICT indicators and academic staff results in KSA, UAE and UK for E-communication.

6.3.1.2 Academic staff Results

Q1-With respect to Saudi, a high percentage shows that some institutions do not provide an e-mail account, i.e., (8%) Yes and (92%) No. In contrast, the results within the UAE and UK were much higher than Saudi as all the academic institutions do provide an e-mail account for its staff (100%). However, within Saudi, these results are much lower than those in the medical sector; while in the UAE and the UK, the results are the same as the medical sector.

Q2-The UAE results shows that a high ratio of the sample (87%) is offering an email account for official emails, and (13%) not offering. Whereas in Saudi a small percentage of staff are provide an email account for official emails (8%) and the majority (92%) are not offered. Finally, in the UK all the institutions (100%) are provided an email account for official emails. These findings from questions (1 and 2) illustrate the vast difference between Saudi Arabia on the one hand, and the UAE and the UK on the other, in terms of the use of technology as an official means of communication in governmental institutions.

Q3- Regarding the different ways of communications in the UAE, less than a half (43%) of the sample agreed that their institutions provide different ways of communication; however, (57%) disagreed. Nonetheless, Saudi results were better than the UAE as (91%) of the sample agreed and only (9%) disagreed. Whereas, the UK results were ahead (100%) as all the samples agreed that they have a different official way of e-communication such as Skype and other types of communication programs.

6.3.2 Results Summary

• The overall results show that universities and hospitals provide e-communication facilities within KSA, UAE and UK; however, the extent of provision of these facilities differs within all three countries. Within Saudi, a lower percentage of participants

agreed that the institution provides an e-mail account and uses it for formal communication purposes. On the contrary, all percentage of respondents in the UK agreed in regard to the availability of e-mail account and had used it for official communication. UK results reflected by a higher number of positive responses. The UAE results were high as well.

- Saud results for the first and second questions were low in both sectors especially the education sector. The reason for this low result may be that as the staff has their own private email and they use it for work as well. Therefore, it is possible that the designers of the electronic communication system at the institutions did not find that the provision of mail is essential to the work as long as the employees have a personal email. However, allowing employees to use private email for work poses serious risks such as, IP theft, losing institutional privacy or violating individual privacy, and disrupting network operations due to exploits which can be implemented on computers not secured by the institutions' internal policies (Guerin, 2017).

- For other ways of electronic communication, the results in Saudi show that WhatsApp is considered better than email, which indicates a lack of planning. It would be better if they use a more professional communication method such as using the email address of the organization. Even with these results, Saudi still ranks behind the UAE and UK, in regard to providing an official means of electronic communication.

6.4 E-Services

E-services refer to electronic services. There is more than one definition for e-services; some of these definitions focus on the fact that it consists of transmitting services electronically, whereas, according to Evanschitzky and Lyer (2007) e-service has multiple definitions. Some academic writers focus on the method of delivery, such as Javalgi, Martin and Tood (2004, p.561) who defined e-services as "Those services that can be delivered electronically." Another definition by Boyer, Hallowell and Roth (2002, p.175) describe e-services as "Interactive services that are delivered on the Internet using advanced telecommunication, information and multimedia." All these definitions do not describe the service itself, but only the way it is delivered, and the structure needed for it to be possible. However, there is one definition that includes the purpose

of the service, which states how the service is provided and how it might benefit customers that use it.

This following definition is useful for the researcher's purposes, as it is the only definition that explains the term e-services and how its benefits users: "an act or performance that creates value and provides benefits for customers through a process that is stored as an algorithm and typically implemented by networked software." (Evanschitzky and Lyer, 2007, pp.16-17).

Questions	Indicators	KSA	UAE	UK
Q1-Does the institution provide electronic services (e.g. vacation requests, information regarding the institution, filling of forms and other forms of services electronically or access to online journals?	Usage/Readiness	(53%) Yes (27%) No	(72%) Yes, (28%) No	(100%) Agreed
Q2- Does the institution provide training on electronic technology to employees?	Usage/Readiness	(5%) Yes (95%) No	(10%) Yes (90%) No	(22%) Yes (78%) No
Q3- Do you use electronic services, What type of e-services do you use?	Usage	(50%) Yes (50%) No	(49%) Yes (51%) No	(100%) Agreed
Q4- Do you face obstacles using e- services? What type of obstacles?	Usage/Skills	(55%) Yes (45%) No	(66%) Yes (34%) No	(59%) Yes (41%) No

Table 21: Represent questions, ICT indicators and medical staff results in KSA, UAE and UK for E- -services.

6.4.1 Medical Staff Results

Q1-Regarding medical results the table (20) above shows that within the UAE the majority of sample (72%) agreed that their institutions provide electronic services such as access to journals. In the UK all the samples (100%) admitted they had electronic services such as electronic recruitment services and access to databases. More than half of the respondents of Saudi (53%) agreed that they had electronic services, such as access to databases. The results show that Saudi is still not in a good position compared to other countries.

Q2-In the UK, a small percentage (22%) agreed to the statements regarding offering digital training. Comparing to UAE (10%) and Saudi (5%), the respondents revealed that organizations there are suffering from a lack of training. This finding shows why Arab employees are less likely to use electronic services, and they will not be able to adapt to the electronic transformation of the institution unless they get training. Overall, this will affect the plan of the change of the Kingdom into an advanced information society due to the importance of the human factor and its role in this transformation.

Q3-In Saudi, only half of the medical staff (50%) agreed that they used e-services, for them the first services are recruitment facilities, second the online application submission, third the electronic recruitment process. Last is the access to the electronic journal; however, UAE staff are more efficient in the use of e-services, with the results of (49%) and use of online recruitment services, then the online application submission, lastly the electronic recruitment process. On the other hand in the UK, all the people used in the sample (100%) agreed that they used the online services first database and online application submission. The final point is E-journals. So even for the usage of the e-services, there is a difference between the UK and Arab countries. Again, this result indicates an evident lack of use of electronic services compared to the effects of other countries among staff.

Q4-The "obstacle" results show that the employees from the medical staff in all three countries face difficulties in using e-services. The majority of the UK (59%), shows that the greatest obstacles, in order, are time, lack of trust and lack of experiences. While

in the UAE and Saudi, they share the same obstacles with different rates (55%) in Saudi and (66%) in the UAE.

Questions	Indicators	KSA	UAE	UK
Q1-Does the institution provide electronic services (e.g. vacation requests, information regarding the institution, filling of forms and other forms of services electronically or access to online journals?	Usage/Readiness	(53%) Yes (47%) No	(96%) Yes (4%) No	(100%) Agreed
Q2- Does the institution provide training on electronic technology to employees?	Usage/Readiness	(5%) Yes (95%) No	(15%) Yes (85%) No	(30%) Yes (70%) No
Q3- Do you use electronic services What type of e-services do you use?	Usage	(40%) Yes (60%) No	(93%) Yes (7%) No	(100%) Agreed
Q4- Do you face obstacles using e- services? What type of obstacles limit you in using e- services?	Usage/Skills	(77%) Yes (23%) No	(55%) Yes (45%) No	(35%) Yes (65%) No

Table 22: Represent questions, ICT indicators and academic staff results in KSA, UAE and UK for E-services.

6.4.2 Academic staff Results

Q1-Regarding the universities offering electronic services, the finding as in table (21) is that in the UAE high percentages of the sample (96%) agreed on having institution e-services such as access of online journals. On the other hand, in Saudi, more than the half of sample (53%) said their institution offers e-service such as access to databases. Some participants refused that institutions provide e-services. In contrast, all staff within the UK (100%) said that electronic services were provided, for example, access to

journals and electronic recruitment. The result for Saudi and the UK is the same for both sectors. The only difference is on the UAE results, where the education results are much higher than the medical.

Q2-However, the results of the second question show that in the UAE a high percentage of the sample (85%) said that their institution does not provide any training for using the e-services, in Saudi even more (95%) said that their institution does not offer training on usage of technology. On the contrary, in the UK respondents (30%) answered positively. These results confirmed that few of the UK staff need electronic training, perhaps because their skills in dealing with modern technology are better than those of the Arab staff, or because of the widespread use of technology in educational curricula in the UK.

Q3-The last question shows that In Saudi less than half (40%) agreed they used electronica services. The first services are accessible to the electronic journal, then online application submission. However, the result is better in the UAE for using electronic services as (53%) of the sample agreed to use the institutions e-services such as access to the electronic journal, and online submission was more than half. Moreover, in the UK all the example (100%) used electronic services such as the online submission and e- sources and all other types of services offered by the institution, such as video conferencing. This different result may be based on the quality or the number of services provided by the institutions. More details in figure (21).

Q4-The sample may face different obstacles while using e-services due to lack of skills, experience and resources. This study found that staff within Saudi (77%) and UAE (55%) of the sample faces difficulties in using e-services due to lack of experience. In contrast, the UK only low percent (35%) of academic staff encounters challenges in using e-services. The results for UK and UAE are better than medical results. Whereas, the Saudi medical results are better result, as the people who face obstacles are fewer.
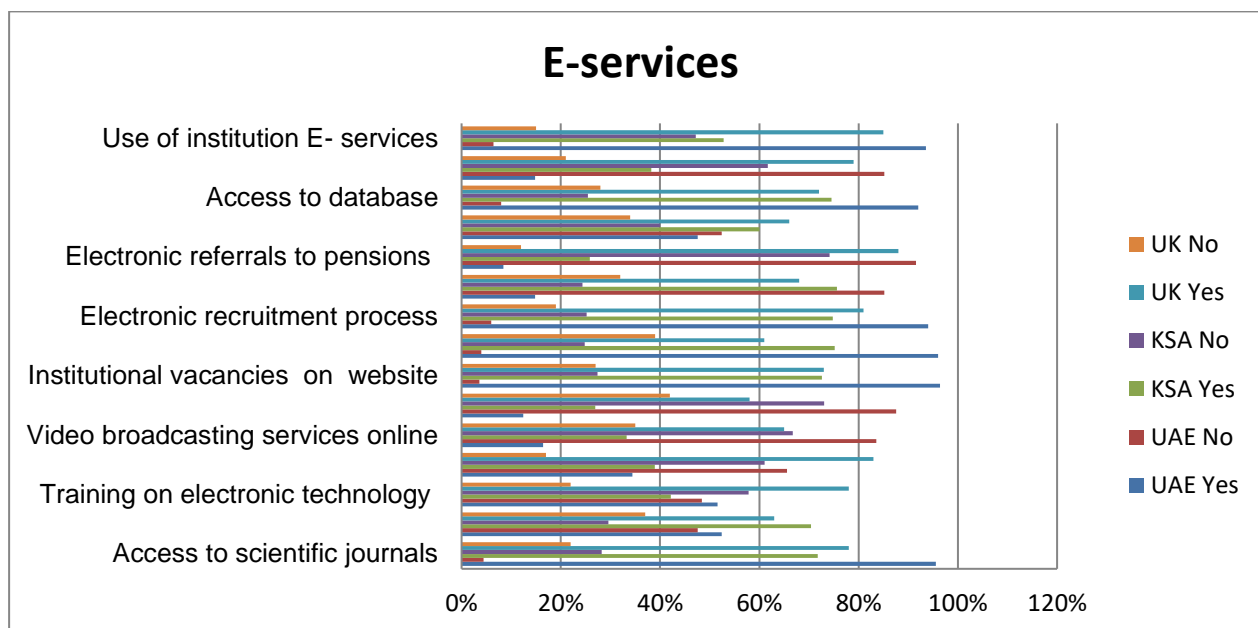
Figure 22: The graph summarises the results of survey with medical/ academic staff regarding types of e- services in KSA, UAE and UK.

Medical staff within Saudi responds about the type of electronic services they used (72%) agreed on having access of online journals, and only (35%) for academic staff. And (75%) of medical staff agreed to use online application submission and only (10%) of academic agreed. For medical sector (66%) whereas (30%) of academic agreed to electronic recruitment process. Contrary to this, UAE (66%) of medical staff agreed that they are having access of online journals and (54%) from academic sector. For electronic recruitment services (44%) agreed from education sector and (34%) of medical sector.

In the UK results (94%) of medical sample, and (97%) of education sample access to databases, and (92%) of medical, and (67%) of education agreed access to online journals. (92%) of medical, (67%) of academic respondents agreed that their institution uses referrals to pensions. Furthermore, respondents from UK revealed that video conferencing (66%) respondents agreed. same percentage for broadcasting facilities respondents said they are provided by institutions.

The following graph (Figure 22) represents findings of survey regarding obstacles faced by academic and medical staff in using e-services.
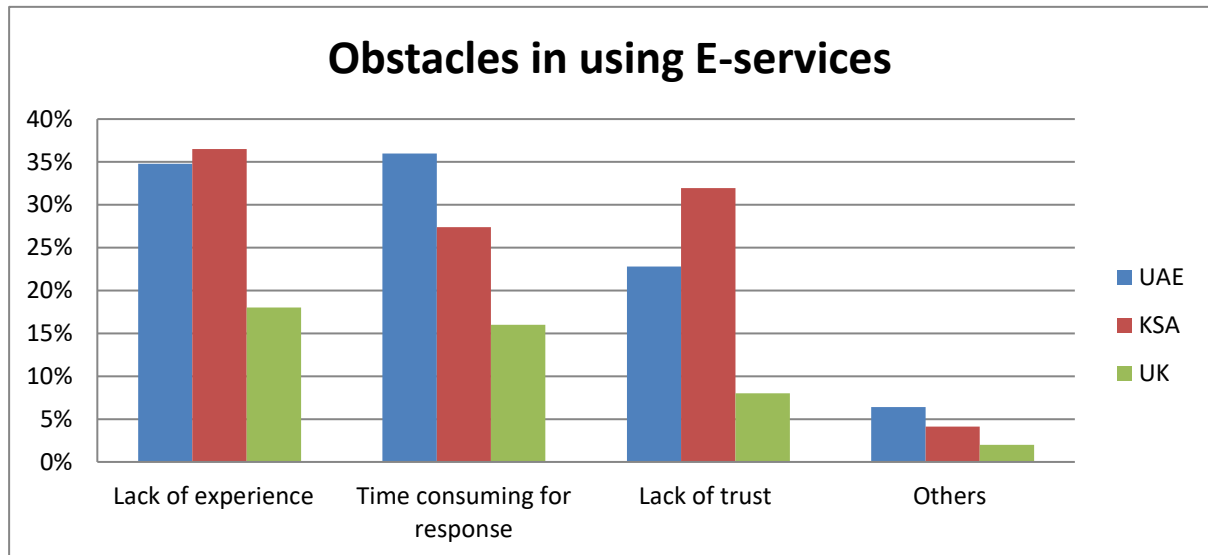
Figure 23: Obstacles in using E-services-Academic /Medical staff in KAS, UAE and UK.

Employees may face different obstacles while using e-services due to lack of skills, experience and resources. This study found that academic/ medical staff within Saudi faces difficulties in using e-services due to lack of experience (37%), lack of trust (32%) and time-consuming aspect (27%). Within UAE, staff encounters challenges in using e-services due to lack of experience (35%), time consumption (36%), and lack of trust (23%). In contrast, the UK staff encounters challenges in using e-services due to lack of experience (18%), time consumption (16%), and lack of trust (8%) which are comparatively lower than the challenges encountered by UAE and Saudi academic staff. The overall results show that equally some of employees from the staff in all the three countries face difficulties in using e-services, In particular lack of experience.

6.4.3 Results Summary

These results show the importance of measuring the electronic services and the extent to which the employees benefit from the quality of services. Based on the measurement results, the organization may identify the shortcomings of the electronic service and thus proceed to rectify this deficiency.

The importance of electronic training for employees is that it is the only way to benefit from all the services provided. The trained employee can evaluate the services, which allows the organization to raise the level of services, also to identify the weak points of the services.

The results show a different type of obstacle in the Arab countries and the UK. Again, to overcome this obstacle, the institutions in Arab countries must pay more attention to e- training, as it is an essential point of the e-training, is to train the employees to use the services and consequently increase their confidence in their abilities. More confidence leads to more frequent, which will increase expertise.

6.5 E-Learning

E-learning refers to electronic learning as Horton (2006, p. 1) defined it "E-Learning is the use of Web and Internet technologies to create experience that educate our fellow human beings." however, first generally accepted definition for e-Learning was provided by the OCED. This definition includes five points, i.e., none or trivial online presence; web supplemented; web dependent, but without significant reduction in classroom time; mixed mode-student. "online activities replace part of face-to-face teaching /learning, but significant campus attendance remains; fully online." (Bullen and Jaanes, 2007, p. 51). Nevertheless, according to Khan and Ally (2015) there are both advantages and disadvantages to e- learning. The advantages of e-learning include, increased flexibility in terms of time and place for the course where students don't need to travel and they can choose the course time; low cost of this type of learning as there is no need for classrooms or other supplements that are used in regular learning; mobile method for learning as the student can use their laptops or smartphones; and global, as the student can choose what course they need from anywhere in the world. in contrast, the different disadvantages of e-learning include lack of control; the learning method seems, with this type of leaning, to deny students the interactive experience inside the class; and lack of computer and ICT skills (Remenyi, 2005).

Questions	Indicators	KSA	UAE	UK
Q1- Is the instantiations provide a clear strategy of e-education services?	Readiness	(19%) Yes (81%) No	(35%) Yes (65%) NO	(78%) Yes (22%) No
Q2-Are the institutions exploiting the advancement in technology to improve e-learning?	Usage/Skills	(21%) Yes (79%) No	(23%) Yes (77%) No	(88%) Yes (12%) No
Q3-Is e-learning technology used in the most efficient way?	Usage	(42%) Yes (58%) No	(40%) Yes (60%0 No	(78%) Yes (22%) No
Q4-Do you use e-learning in your field?	Usage/Skills	(36%) Yes (64%) No	(33%) Yes (67%) No	(85%) Yes (15%) No
Q5-Are e-education materials available to employees on the institution's website?	Readiness	(40%) Yes (60%) No	(36%) Yes (64%) No	(67%) Yes (33%) No

Table 23: Represent questions, ICT indicators and medical staff results in KSA, UAE and UK for E-Learning.

6.5.1 Medical Staff Results

Q1-As far as e-learning is concerned, survey results have revealed that UAE, UK and KSA exhibit comparable trends. Within Saudi, around three - quarter (81%) of the medical staff sample denied that there was a clear strategy to provide e-education services. While in the UAE, the result shows (65%) of medical staff respondents disagreeing about institution's clear policy for providing re-education. Concerning the respondents of the UK, the majority (78%) of the sample agreed that there was a clear strategy to deliver e-education services. The reason for such weak results in Saudi might be the lack of conviction of officials in governmental institutions using modern electronic facilities in teaching or training, or in the absence of recognition by official bodies in some countries of the certificates gained by electronic-learning.

Q2- A high proportion of the sample from the UK (88%) agreed in regard to the institution's exploitation of technology advancement. On the other hand, less than half

of the samples in UAE (23%) and Saudi (21%), agreed in regard to the institution's exploitation of technology. This indicates that in the Arab world there is a lack of awareness within the administration about the importance of electronic learning and a lack of familiarity with the requirements of this style of learning.

Q3-About the efficient use of e-learning technology in the UK the majority (78%) agreed, whereas, less than half in UAE (40%) and Saudi (42%) agreed regarding this issue. To get the benefits of using modern technology in e-learning, there are some necessary technological approaches needed for each course, such as providing teachers with new educational methods that aim to engage students in the educational process effectively, so that they learn better through their interaction with technology. These include; the internet, the projector (LCD), documentary camera, digital camera, and smart board.

Q4-However, in the UAE (33%) and Saudi (36%) more than half of the sample admitted about the use of e-learning technology in their fields. On the contrary, In the UK, the majority (85%) agreed regarding the use of e-learning technology in their areas. This finding shows one of the difficulties in applying approaches and means of assessment in this type of method of learning.

Q5-In the UAE (46%) and Saudi (40%) a high percent of sample disagreed about the availability of e-education material, while in the UK, the majority (67%) agreed. It is likely that the high cost of the design and production of educational software and the lack of conviction of officials of the utility of this service and believe that the budget is better spent on another function may be reasons which affected this availability.
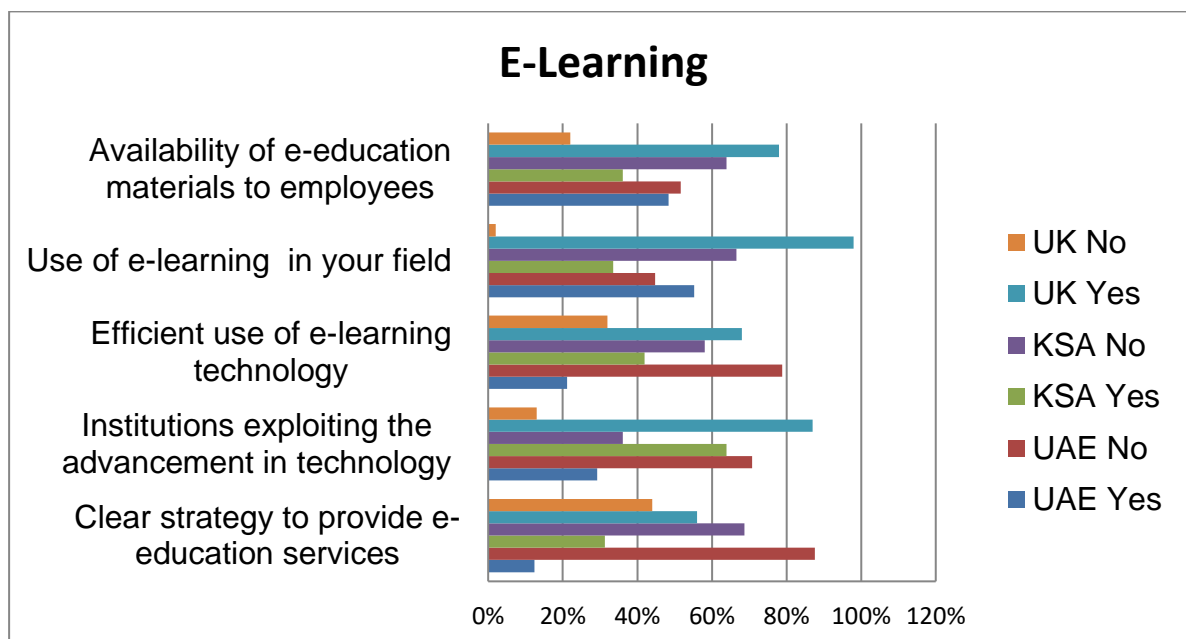
Figure 24: Results survey in academic institutions regarding e-learning facilities in KSA, UAE and UK.

6.5.2 Academic staff results

Q1- Within Saudi, (69%) said no about a clear strategy to provide e-education services. On the other hand, in the UAE (88%) of the majority of academic staff respondents said no about the institution's clear policy for delivering re-education. However, for the respondents of the UK, (44%) denied about a clear strategy to provide e-education services.

This result indicates there is a lack of interest in technological, educational and electronic policies in Arab institutions, due to the known importance of electronic education in achieving educational objectives with high efficiency and economy in time and effort. (Mazzara, 2016).

Q2- In Saudi (64%) agreed regarding institution's exploitation of technology advancement, while in the UAE the staff is not satisfied with this idea as the majority (71%) disagreed regarding institution's exploitation of technology. On the other hand, in the UK (87%) agreed regarding the institution's exploitation of technology advancement. In general, to provide this type of learning, the educational system must be qualified and set some rules, laws and policy.

Q3- Only (42%) of Saudi's agreed regarding efficient use of e-learning technology and (58%) disagreed, while in UAE (79%) their answer was negative about efficient use of e-learning technology, only (21%) responds positively, However, in the UK (68%) responded positively regarding an efficient use of e-learning technology and (32%) no. This result is, in the Saudi and UAE, is due to the lack of standards for the development and operation of an active and independent e-learning program (Sultan, 2017).

Q4- In Saudi only (45%) agreed about the use of e-learning technology in their fields and (55%) disagreed, while (98%) of the UK sample agreed about the use of e-learning technology in their areas, On the contrary, in UAE, only (21%) of staff responded positively and (79%) no. Privacy and confidentiality attacks on internet sites have affected teachers and educators and have raised many questions about the impact on e-learning in the future. Providing both content and assessment is one of the main barriers to e-learning (Sultan, 2017).

Q5-The UAE result shows that (50%) the answer was negative regarding the availability of e-education material. The UK sample (78%) agreed regarding the availability of e-education material. Moreover, in Saudi (38%), there is an availability of e-education material to employees and the majority (62%) said no. So, it is vital to create and publish electronic courses at a high level of quality, as the competition is high to keep pace with the rapid development of international standards (AL- Ali, 2016).

6.5.3 Results Summary

• The overall results show that Saudi exhibits a favorable status of e-learning services to both sectors as compared to the UAE. However, comparing the UAE and Saudi's results with the UK shows there is an increased use of e-learning in the UK.

• However, comparing only UAE and Saudi, regarding the medical sector, there are a few institutions that exploit advancement in technology and efficient use of e-learning technology. Nevertheless, Saudi is better in providing e-education materials to its employees and using e-learning in their field. However, the results also show that UAE has the highest poor outcome (disagreement) in the education sector for

efficient use of e-learning technology, institutions exploiting advancement in technology and a clear strategy to provide e-education services. The reason for the weakness of the results for Arab countries may be the view of the members of the community regarding e-learning that distance learning is less valuable than traditional methods and the unfamiliarity of learners with the skills of using modern technologies.

• The measurement revealed a clear and significant shortfall for this service beginning with a lack of a clear plan in Arab countries and with all questions.

• To set up the e-learning services, the KSA must be providing the infrastructure in the form of equipping school universities and departments of education with the various networks, devices, and software required for the educational process.

• Provide the necessary training for the teacher and the learner and all the administrative and staff to qualify them to deal with this technology and investment optimization.

• To provide the organization with a successful e-learning system, there are some elements which must be taken care of including laws, regulations, decisions, and everything that constitutes the organization of the educational process.

• Of course, the project of transition to digital education requires radical changes, efforts, possibilities, and experiences because it is, in fact, a complete transformation of the educational environment. However, in Saudi, the implementation of the Future Gate program began in 2017 and will be completed during the current year and future years. The Saudi Minister of Education announced the success of the first phase of the program for the transition to digital education in 150 schools and announced the start of the second phase, which will end this year. The second phase will include 150 new schools and 6 education departments, with the initiative expanding next year to 1,500 schools. (mcit,2017).

6.6 Scientific Research

Kerlinger (1985) defined scientific research as "systematic, controlled, and critical investigation of hypothetical propositions about the presumed relations among natural phenomena." (Kerlinger,1985, p.11).

Within medical institutions and hospitals, scientific research has been considered a critical area of concern. This study found that hospitals and universities, in UAE, UK and Saudi have taken a different stance on scientific research facilities. It is crucial for medical and academic staff to exhibit higher performance in scientific research to increase their knowledge and skills.

Questions	Indicators
Q1-Are you required to publish annually?	Usage
Q2-Do you face obstacles while carrying out your scientific research electronically?	Skills
Q3-Is online submission of scientific research required?	Usage
Q4-Does the institution assist you in publishing your scientific research online?	Readiness

Table 24: Represent questions and ICTs indicators for scientific research.
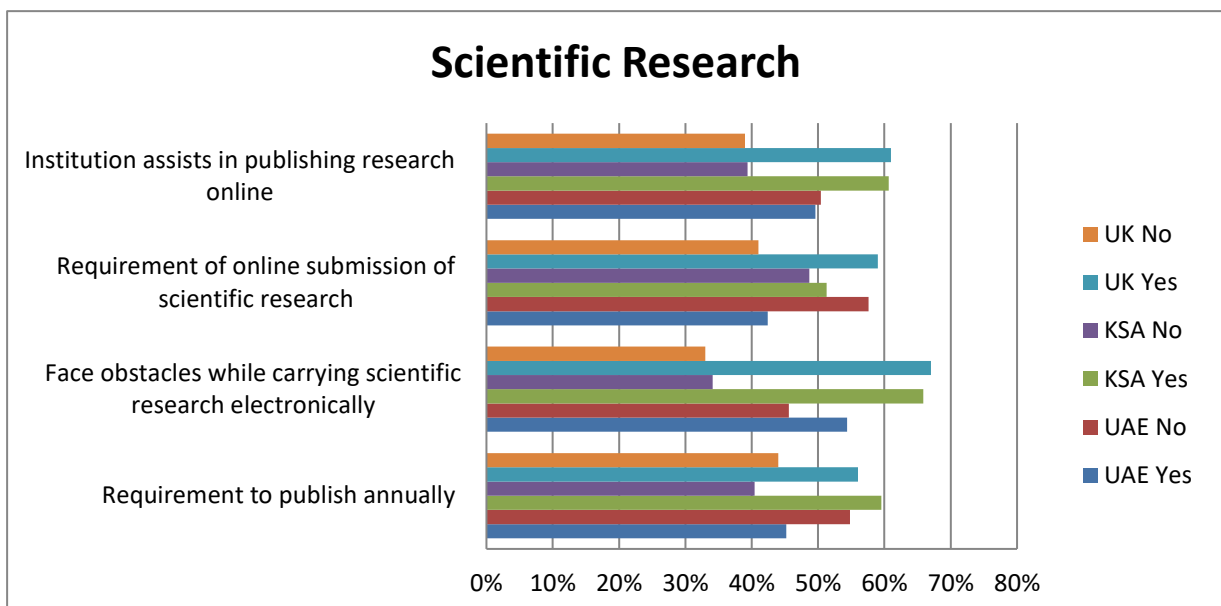
Figure 25: Represents results of survey regarding scientific research facilities provided by medical staff in UAE, UK and Saudi.

6.6.1 Medical staff results

Q1-Within UAE, less than half (45%) of respondents agreed that they are required to publish research annually while (55%) said no. Unlike, more than half (60%) of respondents from the UK agreed that they are required to publish research annually. In contrast, in Saudi, high percentages (67%) of respondents agreed that they are required to publish research annually. This confirms the result of a study (Almaraee, 2016) that all major research areas in the Saudi Kingdom have witnessed remarkable progress in intellectual productivity in general, especially in the fields of physical sciences and mathematics, and in the outputs of disciplines related to life sciences such as biology and clinical sciences.

Q2-In Saudi and the UAE, the majority of (68%) respondents, indicated that they encountered obstacles during research. In the UK less than half (35%) answered that they faced obstacles while conducting research electronically. The Arab result is the same, as both countries share the same constraints and the most important are 1-Absence of laws on intellectual property 2-Lack of translation for foreign references.

Q3-More than half of the UK (59%) sample answered that they are required to publish online research, however, in Saudi (52%) and UAE (45%) less people agreed that they needed to publish online. Again, in Arab countries, there is no law to protect intellectual property, so the researches prefer not to post their research as they fear that it may be 'stolen'.

Q4-For the UAE, the results show that just half (50%) responded that their institution assists them in publishing research. However (61%), respondents from Saudi suggested that their institutions assist in conducting research electronically. In thee UK, the results were close about (62%) agreed that the institutions help in doing research electronically. This result is proof that Saudi focuses on scientific research especially medical research, according to Almaraee (2016) which showed that Saudi Arabia is considered the first ranked in the Arab country in the production of scientific medical research.

Questions	Indicators	KSA	UAE	UK
Q1-Are you required to publish annually?	Usage	(40%) Yes (60%) No	(50%) Yes (50%) No	(53%) Yes (47%) No
Q2-Do you face obstacles while carrying out your scientific research electronically?	Skills	(73%) Yes (27%) No	(65%) Yes (35%) No	(20%) Yes (80%) No
Q3-Is online submission of scientific research required?	Usage	(0%) No	(35%) Yes (75%) No	(100%) Yes
Q4-Does the institution assist you in publishing your scientific research online?	Readiness	(43%) Yes (57%)No	(50%) Yes (50%) No	(88%) Yes (12%)No

Table 25: Represent question, ICTs indicators and results of survey regarding scientific research facilities provided by academic staff in UAE, UK and Saudi.

6.6.2 Academic staff results

Q1-The results from Saudi about the first questions on the requirement for annual publication less than half (40%) responded positively. Whereas, in UAE (50%) half of the samples said yes, and in the UK more than half (53%) agreed. The results for this sector are much lower in the three countries compared to the health sector. This may be due to the size of institutions in the research, especially in the UK, as some of the universities have only a small number of employees. Second, some countries as Saudi Arabia focuses more on medical research. Finally, doctors and health workers are more requested to provide scientific research as approach for their promotion in the Saudi health system.

Q2-For the obstacles, Saudi showed the highest results (73%) compared to the UAE where only half (65%) of the sample said they faced obstacles, while the UK showed that (20%) agreed they met barriers. The results on this question are close to the results of the health sector, and mostly both areas are suffering the same obstacles as mentioned above.

Q3- in Saudi all the sample answered that it is not required to submit their researchers online. On the contrary, in the UK (100%) all of the samples are necessary to submit

their research online; however, UAE (35%) agreed they required an online submission. The enormous difference between results could be because of the technical programs of electronic delivery in the British universities are equipped for this type of service, unlike Arabs who prefer manual delivery, considering the absence or lack of efficiency of modern technology for this service in Arabic universities.

Q4-In regard to the institution assisting in publishing research, the results show that in the UK the majority answered positively (88%), in UAE only half (50%), and Saudi less than half (43%) they are answered positively. The results show that the educational institutions in both Arab countries do not provide significant help to the staff in publishing their research, which may be because of the lack of agreements with publishing institutions or lack of scientific research complying with the criteria for the publication.

6.6.3 Results Summary

- Regarding scientific research field, the health sector in Saudi is very advanced comparing to the education sector.
- The results suggest that hospitals and medical institutions within KSA, as compared to UAE and UK, are more likely to assist their staff in publishing research, meeting requirements of online submission of scientific study and requirements to publish annually.
- Saudi faces the highest level of obstacles while conducting scientific research electronically, in both academic and health sectors.
- Regarding online submission, the results show that there is a huge gap between the Arab countries and the UK, especially in education sectors. The first and most crucial step for the Arab countries is the provision of laws and regulations for the protection of scientific research. The Arab states should design new software programs that allow the delivery and dissemination of scientific research electronically.
- Moreover, the Saudi results are disappointing regarding online submission in academic sectors.
- This finding suggests that hospitals and medical institutions within KSA, as compared to UAE are more likely to assist academic staff in publishing research, meet requirements of online submission of scientific study and publish annually and close to

the UK results. Even though the country also faces the highest level of obstacles while conducting scientific research electronically.

- The Scientific Research sections include four questions, covering (Readiness- skills and usages).

6.7 E-Sources

E-resources is the short term for electronic resources. However, according to AACR2 (2013) update, "an electronic resource is material (data and/ or program(s) encoded for manipulation by a computerized device." (Ramaiah, 2013, p. 230). However, Ramaiah (2013) argued that there are some aspects of electronic resources and he gave an example of how some of these sources don't need the use of a computer, such as a music compact disc, so he defined e- resources as "those material or services that require a computer for access, manipulation or reproduction including but not limit to, numerical, graphical and textual files, electronic journals, bibliographic or full-text and Internet resources." (Ramaiah, 2013, p. 230). The e-resource format includes: journals, books, newspapers, statistical reports… etc.

Questions	Indicators
Q1- Is the institution collaborating with others for an integrated academic database?	Readiness
Q2-Are academic databases user-friendly?	Readiness/Usage
Q3-Dose the institution provides e-sources database?	Readiness/Usage
Q4-Do you use the Internet as an academic source?	Usage

Table 26: Represent questions and ICT indicators for e- sources faciality.
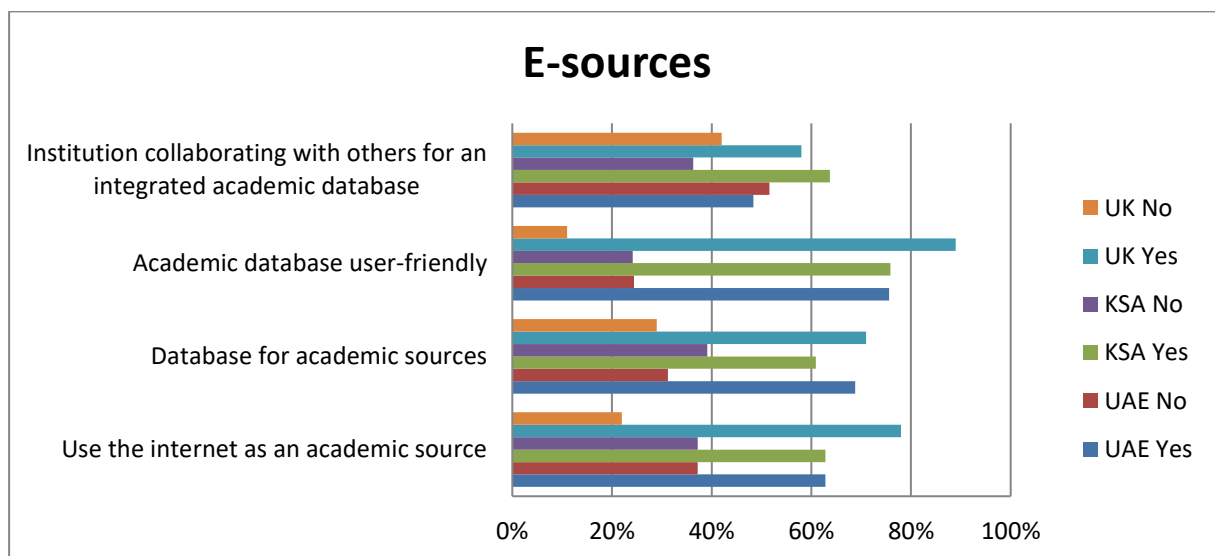
Figure 26: The graph represents results of survey regarding e-sources for medical sector in KSA, UAE and UK.

6.7.1 Medical staff results

Q1-More than half of the UK (59%) agreed regarding the institution's collaboration with others for an integrated academic database, while (41%) disagreed. However, in Saudi, the result was (64%) higher than UAE (55%), but the difference was not significant. Due to the importance of medical references, the reason may be that databases in medical institutions are very advanced and do not need external agreements.

Q2-The result of Saudi and UAE was the same as the majority (78%) agreed about the user-friendly nature of academic databases. Moreover, in the UK the majority of the sample (90%) agreed. These high results demonstrate the interest of officials in the three countries in designing reliable and easy-to-use academic databases.

Q3-E-sources represent different facilities such as access to databases, journals, and other academic sources. Within UAE (65%), and Saudi (60%) close percentage respondents agreed that their institution provides e-database for academic sources, while in the UK the majority (70%) respondents they have e-database. Having academic databases help significantly speed up the process of accessing the sources they contain. Instead of searching manually, information is collected so that it can be easily obtained, processed or used in different future functions.

Q4-Regarding the use of the internet for academic sources, the result shows that in Saudi and UAE they have the same results as more than half (63%) said yes. Also, the UK result was higher (79%). This result could be because the internet, in general, is not regarded as a reliable source of information, especially medical information. Moreover, medical research is always published in journals or conferences, and access typically requires a monthly or annual subscription.

Questions	Indicators	KSA	UAE	UK
Q1- Is the institution collaborating with others for an integrated academic database?	Readiness	(77%) Yes (23%) No	(69%) Yes (31%) No	(88%) Yes (12%) No
Q2-Are academic databases user-friendly?	Readiness/Usage	(80%) Yes (20%) No	(83%) Yes (17%) No	(93%) Yes (7%) No
Q3-Dose the institution provides e-sources database?	Readiness/Usage	(56%) Yes (44%) No	(58%) Yes (42%) No	(100%) Yes
Q4-Do you use the Internet as an academic source?	Usage	(100%) Yes	(100%) Yes	(80%) Yes (20%) N0

Table 27: Represents questions, ICT indicators and results for academic sector in KSA, UAE and UK for E-sources.

6.7.2 Academic staff Results

Q1-In UAE a high percentage (69%) of respondents stated that they recognized the assistance of their institutions for collaborating with others to develop integrated academic databases while (31%) answered no. Also, the majority (88%) of UK staff agreed and only (12%) have disagreed. In Saudi also, the result was good as the majority (77%) respondents recognized the assistance of institutions for collaborating with others to develop integrated academic databases and (23%) answered no. The results of this question are higher than those of the medical sectors. As collaborating with others is an essential step in the academic field, which allows the beneficiary access to a more significant number of references using more than a reliable database as it includes other languages, for example, the cooperation agreements between King

Abdelaziz University in Jeddah and the Library and Information Science Abstracts (LISA).

Q2-Regarding the second question, most staff in the three countries agreed as the friendly nature of academic databases (80%) in Saudi (83%) UAE and (93%) the UK. The result is close to the medical sector in the three countries.

Q3-The results from Saudi and UAE were almost the same, as more than half of the sample (56%) and (58%) answered that e-databases as academic sources had been provided, while (44%) and (42%) no. Whereas all staff in the UK (100%) answered positively. The findings show that the Arab countries should pay more attention to this point, considering the importance of accessing the right information in a short time. The rules of access must be easy to use.

Q4-Lastly the results for Arab counties were the same as all staff (100%) agreed to use the internet as an academic source. Moreover, this is surprising but shows excellent progress as the internet in Saudi is not an academic recuse (Simsim, 2017). While in the UK the majority (80%) said yes to using the internet for academic resources except for Wikipedia.

6.7.3 Results Summary

- This result implies that hospitals and educational institutions within the UK provides higher assistance to their staff as compared to UAE and Saudi for delivering academic databases. However, in particular, both Saudi and UAE also includes the use of e- database as an academic source. Nevertheless, the academic database is user-friendly in all three countries in both sectors.

- In order to get full benefit from electronic resources, educational and health institutions must determine the scientific standards to be applied in the process of evaluating the sources of electronic information available on the internet in order to select the appropriate scientific research characteristics from accuracy, credibility, objectivity, popularity and finally modernity, as well as how to document them by focusing on the most essential bibliographic data in the documentation appropriate to Methodological rules on the one hand and the characteristics of the internet services

such as research knowledge such as: e-books, periodicals and scientific journals, databases and library indexes, WAP, wikis, or communication such as: e-mail, newsgroups and social networks such as YouTube.

- Overall, the results of measuring the efficiency of electronic resources, the results prove that the policymakers are aware for the importance of electronic resources in modern society, and their role in the process of change to an information society, where the speed of access and accuracy of information is one of the most critical requirements.

- For the first time in this study the Saudi results are close to UK and UAE and were acceptable and good in both sectors.

6.8 Results of survey with Managerial staff

6.8.1 E-communication

Questions	Indicators	KSA	UAE	UK
Q1-Does the institution provide an email account?	Readiness	(50%) Yes (50%) No	(97%) Yes (3%) No	(100%) Yes
Q2-Are the institution email accounts provided considered to be a formal method of communication?	Readiness/Usage	(84%) Yes (20%) No	(91%) Yes (8%) No	(100%) Yes
Q3-Are the institutions provide different ways of electronic communication?	Readiness	(90%) Yes (10%) No	(92%) Yes (8%) No	(95%) Yes (5%) No

Table 28: E-communication, ICTs indicators and managers result in medical sector in   KSA, UAE and UK.

6.8.1.1 Medical Managerial results

Managerial staff needs to be provided e-communication sources and facilities for accomplishing their administrative tasks and duties efficiently and effectively.

Q1-Within UAE, the majority of manager (97%) respondents agreed that their organization provides an e-mail account. Moreover, in the UK (100%) of the sample said yes.

Contrary to this, only half (50%) of the respondents in Saudi agreed on having an e-mail account provided by their institution. The results are still disappointing for Saudi and point to the need for even more considerable effort to deliver email to all employees.

Q2-In UAE the majority (91%) agreed on using e-mail account for formal communication, also in Saudi a high percentage (84%) agreed on using email-account for formal discussion within institutions, and in UK (100%) of the sample agreed on using e-mail account official. So, this result confirms if the institution provides an e-mail account, it will be official. That means some of the institutions in Saudi still prefer the old way of communication as they don't trust the new technology.

Q3-Further, the majority of respondents from Saudi (90%), UAE (92%) and UK (95%) said yes, their institutions provide different ways of electronic communication. The results for the first time were very close.

Questions	Indicators	KSA	UAE	UK
Q1-Does the institution provide an email account?	Readiness	(50%) Yes (50%) No	(95%) Yes (5%) No	(100%) Yes
Q2-Are the institution email accounts provided considered to be a formal method of communication?	Readiness/Usage	(44%) Yes (66%) No	(60%) Yes (40%) No	(100%) Yes
Q3-Are the institutions provide different ways of electronic communication?	Readiness	(55%) Yes (45%) No	(82%) Yes (18%) No	(100%) Yes

Table 29: E-communication questions, ICTs indicators and managerial staff results in academic sector in KSA, UAE and UK.

6.8.1.2 Academic Managerial results

Q1-In Saudi half of the sample (50%) agreed that they have an official email. In contrast, the responses obtained from UAE participants shows that the majority of respondents (95%) agreed that their organization provides an e-mail account. And in the UK all sample (100%) agreed.

Q2-However, UAE more than half (60%) agreed on using email-account for official emails and (40%) disagree. In the UK all the samples (100%) agreed on using e-mail account for formal communication. And Saudi less of the half (44%) were using an e-mail account for official emails. And (56%) not using it.

Q3-More than half (55%) of Saudi respondents agreed that their organization provided different ways of electronic communication approaches. The majority (83%) of UAE also agreed. Whereas, all the sample (100%) from the UK said yes. Internal communication between departments and employees is essential and must be the heart of every business and administrative, whether large or small. Therefore, based on the study result, it seems clear that the e-communication in Saudi is suffering from a lack of planning.

6.8.2 Results Summary

- The overall results suggest that both Saudi and UAE provides a good level of e-communication and sources to the manager for accomplishing their duties and tasks most efficiently and effectively. However, the UK is more efficient in providing good e-communication and sources to managerial staff in hospitals and academic institutions. Comparing only the two Arabic countries, UAE is better than Saudi as its institutions offer different ways of electronic communication and use an e-mail account for official emails. Nevertheless, the Saudi medical sector is still better than the academic areas in every aspect, such as providing e-mail accounts for formal communications or offer different ways to e-communication.

- Within medical institutions finding reflecting that, Saudi and UAE encourage formal communication within organizations.

• The results of managers were higher, as the e-communication was more available and used more than among the staff.

6.9 E-services and Obstacles in using E-services

Results revealed that managerial staff in Saudi, UK and UAE have been provided different forms of e-services.

Questions	Indicators	KSA	UAE	UK
Q1-Does the institution provide electronic services (e.g. vacation requests, information regarding the institution, filling of forms and other forms of services electronically or access to online journals?	Usage/Readiness	(73%) Yes (45%) No	(81%) Yes, (45%) No	(100%) Yes
Q2- Does the institution provide training on electronic technology to employees?	Usage/Readiness	(5%) Yes (95%) No	(17%) Yes (83%) No	(87%) Yes (13%) No
Q3- Do you use electronic services? What type of e-services do you use?	Usage	(64%) Yes (36%) No	(93%) Yes (7%) No	(100%) Yes
Q4- Do you face obstacles using services? What type of obstacles?	Usage/Skills	(80%) Yes (20%) No	(88%) Yes (12%) No	(38%) Yes (62%) No

Table 30: Represent E-services questions, ICTs indicators, and results by managers in the medical sector in KSA, UAE and UK.

6.9.1 Medical managerial results

Q1-Managerial staff within the UAE has been provided electronic services as (81%) agreed and (19%) have disagreed. Also, high (73%) respondents of Saudi agreed on having the institute's electronic services reflected by (73%) Yes and (27%) No; in contrast, the managerial staff within the UK has been provided electronic services (100%). The results indicate that all three countries offer electronic services to managers with varying ratios, and the results of Saudi Arabia for managers are better than for

employees, as the heads of departments are keen to introduce technology in the administration more than in other sections in order to implement the government plan (Madini and de Nooy, 2014).

Q2-However, more than (83%) respondents from UAE refused statement regarding the identification of training needs electronically and only (17%) agreed, in Saudi most of the sample (95%) respondents refused about training on the usage of technology. However, very few respondents from the UK (13%) compared to UAE and Saudi refused statements regarding the identification of training needs electronically and (87%) agreed that their institutions offer training. This finding has approved that the lack of interest in training programs will affect the use of electronic services and a lack of knowledge as to how to deal with this developing technology will delay the transformation of Saudi Arabia into an information society.

Q3-However, the results as shown most organizations in Saudi provide e-services facilities to their managerial staff as (64%) answered Yes. In UAE huge percenters of samples (93%). From the UK (100%) admitted to offering e-services by their organizations. More details provided in figure (26).

Q4- For the status of obstacles is most active in UAE (88%) and comparatively strong in Saudi where it is (80%), but it is (38%) in the UK. More details in figure (27).
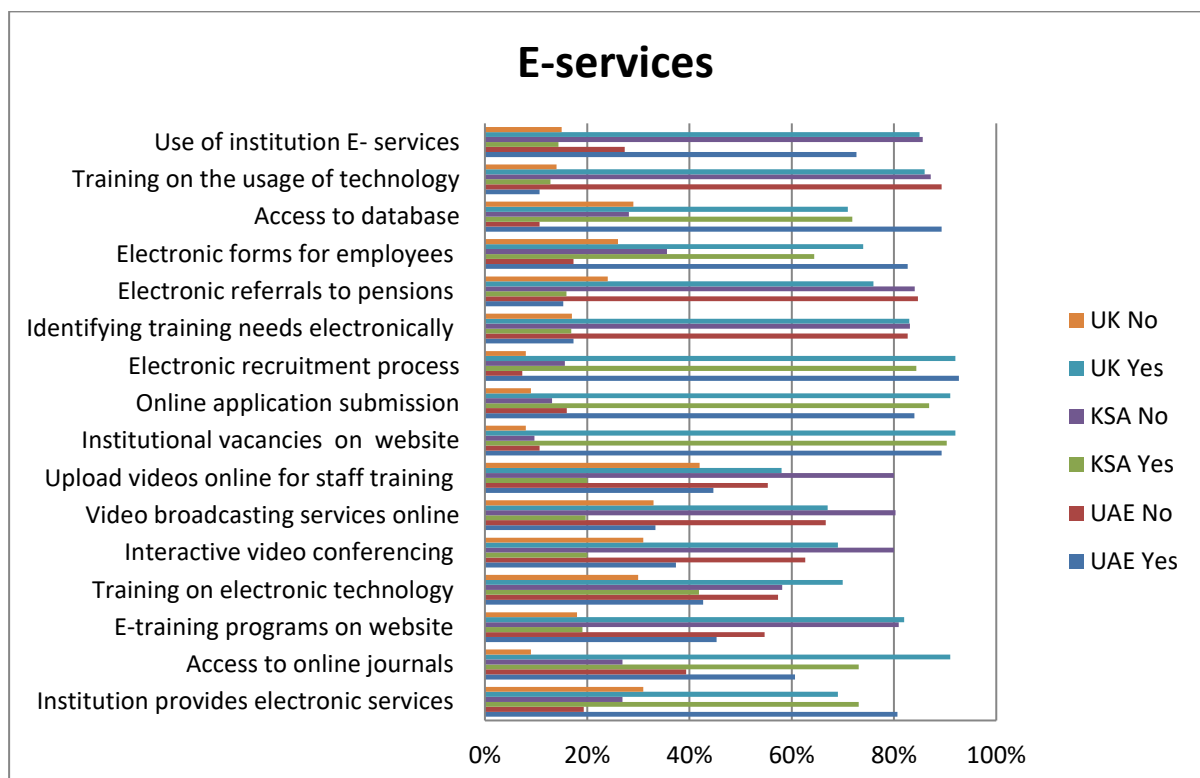
Figure 27: The results by managers regarding e- services.

Results revealed that managerial staff in Saudi, UK, and UAE had been provided different forms of e-services. Administrative staff within the UAE has been provided electronic services, for example, access to journals (61%), electronic recruitment services (92%), access to databases (89%). In Saudi (73%) agreed on having access of online journals, in contrast, the managerial staff within the UK has been provided electronic services and access to journals (91%), electronic recruitment services (92%), use of institution e-services (85%) and access to databases (71%). (67%) Respondents from the UK revealed that they use institutions video conferencing and broadcasting facilities respectively. Comparing only UAE and KSA, the (17%) of UAE use video broadcasting (20%) from Saudi However, most organizations in Saudi also provide online recruitment facilities to managerial staff (87%) agreed to online application submission and (84%) agreed to the electronic recruitment process.

Questions	Indicators	KSA	UAE	UK
Q1-Does the institution provide electronic services (e.g. vacation requests, information regarding the institution, filling of forms and other forms of services electronically or access to online journals?	Usage/Readiness	(55%) Yes (45%) No	(73%) Yes, (27%) No	(100%) Yes
Q2- Does the institution provide training on electronic technology to employees?	Usage/Readiness	(100%) No	(45%) Yes (55%) No	(78%) Yes (22%) No
Q3- Do you use electronic services, What type of e-services do you use?	Usage	(64%) Yes (36%) No	(93%) Yes (7%) No	(100%) Yes
Q4- Do you face obstacles using services? What type of obstacles?	Usage/Skills	(82%) Yes (18%) No	(83%) Yes (17%) No	(33%) Yes (67%) No

Table 31: Represent E-services questions, ICTs indicators, and results by managers in the academic sector in KSA, UAE and UK.

6.9.2 Academic managerial results

Q1-For providing E-services In the UAE (73%) agreed and (27%) have disagreed, in Saudi more than half (55%) of the sample said Yes, their institution provides e-services and (45%) answered No. While, all the sample (100%) in UK answered the institution provides e-services. This is less than the result of the health sector, and same as the results from the academic staff and there is the same result from the UK for all sectors and sections in this study.

Q2-In Saudi all the sample (100%) and in UAE (95%) majority answered that they do not get training on usage of technology; however, in the UK the majority (78%) agreed that they get training on usage of technology. Again, this confirms the existence of a serious problems in both Arab countries.

Q3-In UAE (93%) managers agreed to use of institution e-services, and Saudi results were lower reflected by (64%) Yes and (36%) No; whereas, all the sample from UK (100%) agreed that all management transactions are electronic. The reasons for Saudi results possible that there is repeated a technical problem or preference for the use of traditional services.

Q4-Furthermore all the managers in the three countries agreed that they faced obstacles, However, in different proportions as Saudi (82%) and UAE (83%) Whereas, UK result shows that only (33%) agreed that they face obstacles. More details in Figure (27).
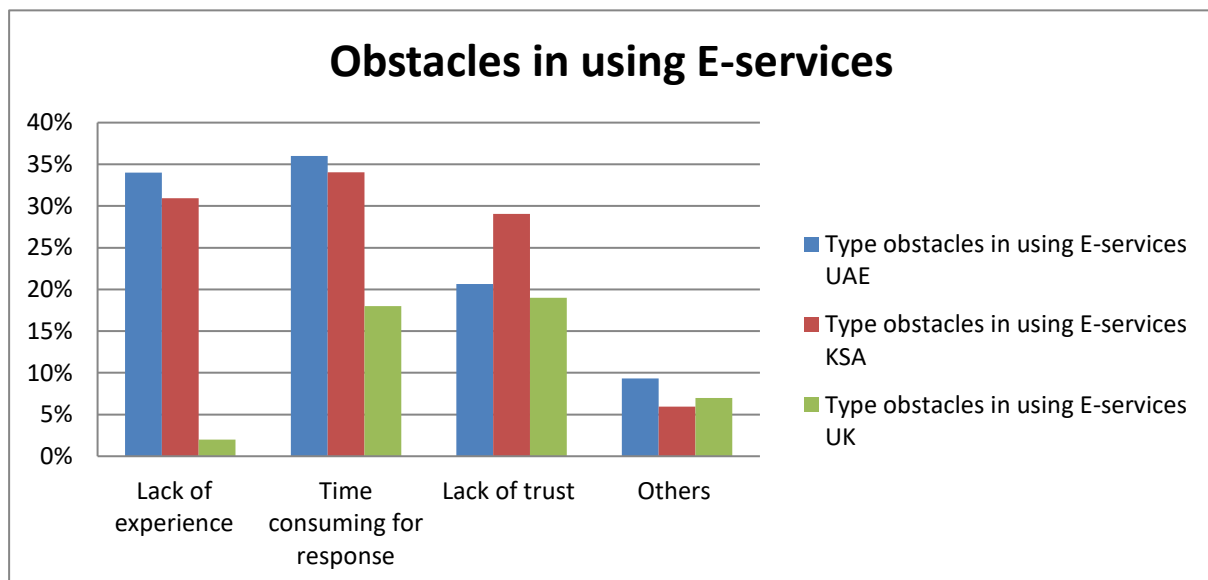
Figure 28: Represents results of survey with managerial staff regarding obstacles faced in using e-services.

Like medical/academic staff, managerial staff may also face multiple obstacles in using e-services. In all the three countries, managerial staff have been facing obstacles in using e-services but is comparatively lower in UK. The different obstacles include lack of experience (34% UAE, 2% UK and 31% Saudi), time-consuming aspect (36% UAE, 18% UK and 33% Saudi), and lack of trust (21% UAE, 19% UK and 29% Saudi).

6.9.3 Results Summary

• Comparing only the UAE and KSA, the respondents of both countries revealed that organizations need to provide training assessment in health and education sectors electronically. However, video conferencing and video broadcasting facilities also show low results.

• The results show that the institutions in all three countries are providing electronic training for their staff, but some employees refuse this training for personal reasons. This study does not disclose the nature of refused reason, but due to the nature of managers in Saudi Arabia, as the fear of being accused of ignorance is the reason why they do not want to try. Additionally, the age is another factor.

• Regarding e-services obstacles in Saudi for the medical sector, the main one was the time-consuming nature of their use, while lack of experiences was the main one for the academic sector. However, that leads to the fact that the low skills of using the new technology. Moreover, the English language might have affected the academic sector results. Therefore, the researcher considers that the ministry of educations in Saudi must pay more attention to improve their staff abilities.

• The medical sector in Saudi still ahead of the education sector.

• The overall results of E-service facilities show that UK hospitals and universities institutions are better than UAE and Saudi institutions in providing different e-services to their staff. However, Saudi as compared to UAE and UK and the UK has the biggest concern for providing the training on electronic technology, an interactive video conferencing, a video broadcasting services online, uploading the online videos for staff training, the electronic referrals to pensions and training staff on the usage of the technology. On the other hand, Saudi has the least concern for re-training programs on the website, training on electronic technology, interactive video conferencing, video broadcasting services online, uploading videos online for staff training, identifying training needs and training staff on the use of technology. Besides this, Saudi's institutional staff faces more obstacles in using e-services compared to the UAE and UK, where the issue of lack of experiences is more in Saudi than in the UAE. However, UK institutional staff face the least obstacles in using e-services among all the three selected countries.

6.10. E-HRM services

E-HRM is the short term for electronic Human Resources Management.

The definition of e-HRM can differ; the following paragraphs will show some of these definitions in order to give a clear idea about e-HRM.

Firstly, Ruta (2005, p. 36) says that e-HRM as "HR portals are vehicles through which HR information and applications can be channeled effectively and efficiently. Through HR portals, administrative activities could be updated by users and may have the access to customized and personalized news, and resource applications, and e-commerce options. Through HR portals managers are able to generate reports, examine employee activities and manage their own activities.".

Bondarouk, Ruël and Parry (2017, p.507) define e-HRM as "an umbrella term covering all possible integration mechanisms and contents between HRM and Information Technologies aiming at creating value within and across organizations for targeted employees and management.".

Whereas, Lepak & Snell (1998, p. 217) refer to e-HRM by stating that "Virtual HR is a network-based structure built on partnerships and typically mediated by information technologies to help the organization acquire, develop, and deploy intellectual capital.".

Ruël, Bondarouk and Looise (2004, p. 36) believe that e-HRM is "a way of implementing HRM strategies, policies, and practices in organizations through the conscious and direct support of and/or with the full use of channels based on web-technologies.".

Voermans and Van Veldhoven (2007, p. 889) argued that "e-HRM could be narrowly defined as the administrative support of the HR function in organizations by using Internet technology." StrohMeier (2007, p. 20) defines e-HRM as the "planning, implementation and application of information technology for both networking and supporting at least two individual or collective actors in their shared performing of HR activities".

Parry and Tyson (2011) argued that E-HRM activities can be classified into three categories: Operational, Relational and Transformational HRM. Activities differ in each

category and workload is allocated differently between them; they all contribute in management and achieving strategic objectives and, by integrating them electronically, firms and enterprises may save on costs and raise efficiency significantly, this contributing to long term growth.

Operational HRM includes managing fundamental activities such as keeping a record of employee data and payrolls along with company plans, and this is allocated the greatest proportion of the workload in the department. Integrating into e-HRM will make operational activities more efficient and accurate; employees can be given the opportunity to personally update their personal information online to keep it up-to-date. **Relational HRM** includes the management of employee turnover and recruitment, along with performance appraisal for existing employees.

By using e-recruitment and e-selection, the department can efficiently screen applicants to save time and help find the most suitable candidate for an open position. **Transformational HRM** is the most complex category in the department and involves responsibility for managing the company's performance as a whole; it ensures that strategies are followed accordingly to meet the short- and long-term visions and objectives of the company, and it is gradually becoming the most influential activity in the department. Also, this activity can be improved by integrating the department electronically, web-based approaches can be used to make the workforce flexible and ready to adopt new approaches and strategies quickly and proficiently to meet the company's long-term visions and objectives. The researcher will adopt the definition of Voermans and Van Veldhoven (2007). Electronic human resource management has been an emerging trend to incorporate technology for developing and implementing policies, practices and processes of human resource management.

Questions	Indicators	KSA	UAE	UK
Q1-Do you have any problems understanding the concept of electronic management?	Readiness	(89%) Yes (11%) No	(90%) Yes, (10%) No	(100%) Yes
Q2-Will e-HRM help give the institutions a competitive advantage?	Impact	(35%) Yes (65%) No	(45%) Yes (55%) No	(98%) Yes (2%) No
Q3-Will e-HRM reduce the number of users visiting the department?	Impact	(50%) Yes (50%) No	(50%) Yes (50%) No	(93%) Yes (7%) No
Q4-Will e-HRM reduce human errors?	Impact	(65%) Yes (35%) No	(72%) Yes, (28%) No	(79%) Yes (21%) No
Q5-Will e-HRM ease access to employees' files?	Impact	(77%) Yes (23%) No	(65%) Yes (35%) No	(100%) Yes
Q6-Will e-HRM help in the decision-making process?	Impact	(15%) Yes (85%) No	(15%) Yes (85%) No	(97%) Yes (3%) No
Q7 -Does e-HRM improve the efficiency of managerial operations in the institution?	Impact	(65%) Yes (45%) No	(67%) Yes (43%) No	(100%) Yes
Q8-Do the different managerial departments take part in the setting up of strategic plans regarding transforming into an e-management?	Impact	(25%) Yes (75%) No	(27%) Yes, (73%) No	(100%) Yes
Q9-Are any official decisions made to transform the institution to e-management?	Readiness	(55%) Yes (45%) No	(75%) Yes (35%) No	(100%) Yes
Q10-Is the institution undergoing programmed to raise awareness of e-management?	Readiness	(89%) Yes (11%) No	(90%) Yes (10%) No	(100%) Yes

Q11-Does the institution officially certify e-signatures?	Readiness	(35%) Yes (65%) No	(37%) Yes (63%) No	(81%) Yes (19%) No
Q12-Does the institution continuously provide qualified staff to facilitate the transition to an e-management?	Readiness	(25%) Yes (75%) No	(41%) Yes, (59%) No	(85%) Yes (15%) No
Q13-Are electronic used in recruitment processes?	Usage	(41%) Yes (59%) No	(55%) Yes (45%) No	(88%) Yes (12%) No

Table 32: Represent questions, ICTs indicators, and results for E- HRM in KSA, UAE and UK.

6.10.1 Results for managers

Q1-In UK all the respondents (100%) agreed to no problem in understanding e-management. Also, in Saudi and UAE, most managers (89%) and (90%) have a clear idea about e-management. These results indicate the awareness of those responsible for planning because the concept of electronic management is one of the modern concepts in contemporary administrative thought. It is a new pattern, leaving its technological effects on the management of institutions and their strategies and functions. Indeed, these effects are not only due to the technological dimensions of digital technologies but also extend to the administrative dimensions of the development of administrative concepts accumulated for many decades, may be applied to achieve greater administrative flexibility.

Q2-However, more than a half respondent from UAE still perceive that E-HRM does not help in gaining competitive advantage reflected by (45%) Yes and (55%) No. Also, the majority of respondents from KSA believe that e-HRM does not help in gaining competitive advantage as only (35%) answered Yes and (65%) No. While almost all the managers in the UK (98%) have agreed that e-HRM helps in gaining competitive advantage. The results of the Arab countries are completely contradictory to the results of the UK. According to (Yunus, 2017), increased competition among governmental institutions and the need for mechanisms of excellence within each institution seeking

to compete, is one of the justifications for a shift towards electronic management in a governmental institution.

Q3-In the UK the majority (93%) believes that the e-HRM reduces visiting the HR-department. However, in Saudi and the UAE, only half of the managers (50%) agreed that e-HRM reduces visiting the HR department. For Arab results, the reasons may be employee distrust in the electronic system or because most of electronic programs and information on the networks are in English.

Q4-More than half from Saudi (65%) respondents believe that E-HRM helps in receding human error and (35%) said No. However, the majority in the UK (79%) agreed that E-HRM reduces human error whereas (21%) disagreed. Also, in the UAE (72%) the majority believes that E-HRM has a positive role in receding human error whereas (28%) answered No. The results indicate that E-HRM helps to reduce human errors, However, regarding Saudi, the reason the result is not high is because of the lack of experience of managers in the use of electronic management. Moreover, the transformation of this administration started only in (2014) (Awed, 2015).

Q5-Survey results suggest that managerial staff in UAE considers E-HRM to give easy access to employee files as more than half (65%) of the respondents agreed and (35%) disagreed. In Saudi, the majority (77%) believes that E-HRM plays a positive role in accessing employee records and (23%) say No. While in the UK all managers (100%) agreed that E- HRM gives easy access to employee files. The high results prove the effectiveness of electronic management, and this is a motivation for all transactions to be transferred to e-management.

Q6-All managers from the UK (100%) agreed that E- HRM helps in decision making. However, in Saudi and the UAE, the majority (85%) have disagreed with this statement. This is a surprising result for both Arab countries, as one of the justifications for the shift towards electronic management in institutions is an increasing reliance on information technology in administrative decision-making (Salma, 2016).

Q7- Also, more than half of Saudi and UAE managers agreed on the role of E-HRM in improving efficiency reflected by (65%) and (67%) meanwhile (35%) and (33%) answered No. However, in the UK, the results show all the respondents agreed (100%)

that E- HRM improves efficiency of managerial operation, an electronic management defined as the total of administrative processes and installations that allow the use of electronic means to implement ICTs efficiently (Yunus, 2017). This will lead to the development of the administrative organization in the governmental institution and improving the services provided to employees and managers beneficiaries in all management processes.

Q8-In both countries KSA and UAE, the majority (25% and 27%) respondents revealed that managerial departments do not participate in transforming the organization into the e-management system. Whereas, in the UK all the managers agreed. The low results from Arab countries could be because of employees' fear of the impact of modern technology on their interests, and the consequent reduction of employment and low incentives, and the tightening of control. Many employees of governmental agencies fear electronic transactions in case of leakage or loss of personal information. (Salma, 2016).

Q9-In Saudi more than half (55%) said Yes there is an official decision made to transform the institution into an e-management one while (45%) answered No. In the UAE the majority (75%) agreed and (25%) have disagreed. All the managers (100%) from the UK said Yes. This is an important point as the official's decision should have complete conviction and a clear vision of a transition from management in their traditional form to e-management to provide full support and the potential for transition to e-management.

Q10-The Survey results suggested that the majority of managerial staff in UAE and Saudi (89%) and (90%) respectively agreed that E-HRM programs for increasing awareness for e-management whereas a small percentage have disagreed (11%) from Saudi and (10%) from UAE. While the UK provides higher results as all staff (100%) agreed. This result shows how culture plays an important role in accepting the transferring into electronic management, whether at the level of management or employees. Where social awareness of the culture of electronic management is a prerequisite for the transition to new technology through its application, which requires concerted efforts to raise public awareness and enhance the psychological and

behavioral readiness of those concerned to counter the nature of this transformation (Salma, 2016).

Q11-The majority (81%) from UK respondents say that their institution certifies e-signatures, Whereas, Saudi (35%) and UAE (37%) provides very low results and the majority said No (65%) Saudi and (63%) UAE. This might be based on the lack of legislation and regulations governing electronic management programs to deal with computer crimes and security breaches.

Q12- From the UK all (100%) respondents Yes that their institution provides qualified staff for transition into e-management. A small percentage (45%) from UAE said Yes and (55%) No. Unlike Saudi where even lower percentages (43%) agreed and (57%) disagreed. According to Yunus (2017), considering the availability of human resources capable of e-management is the most important element in the transformation towards electronic management. They represent the digital leaders, managers, and analysts of knowledge resources, intellectual capital, strategic planning and implementation of e-management elements and overcome their problems. E-management requires special skills in dealing with computers, methods of data entry, retrieval, archiving, transfer and archiving, or dealing with data protection and monitoring programs and methods, and methods of implementing electronic monitoring. All of this requires trained human resources that can deal with the material and technical requirements needed to manage and manage information through electronic management systems and applications. The provision of qualified human resources and their continuous training and development in the field of e-management applications will undoubtedly facilitate the task of senior leaders in the preparation of e-management.

Q13-About the application of e-recruitment facilities more than half (55%) from UAE replied Yes, while (45%) No. And in the UK the majority (88%) agreed on the application of e-recruitment facilities in the organization only (12%) have disagreed. However. Saudi showed lower results as less than half (41%) said Yes, and (59%) No. However, it is necessary to move towards e-recruitment as the governments are under constant pressure from citizens and beneficiaries, in general, to meet the increasing demand for employment, due to the increasing number of job applicants. Electronic recruitment

should be used to improve the quality of service, accelerate the delivery of administrative services to institutions, and eliminate routine and bureaucracy (Yunus, 2017).

The following graph (Figure 28) represents results of different issues faced by UAE, UK and Saudi staff regarding EHRM services:
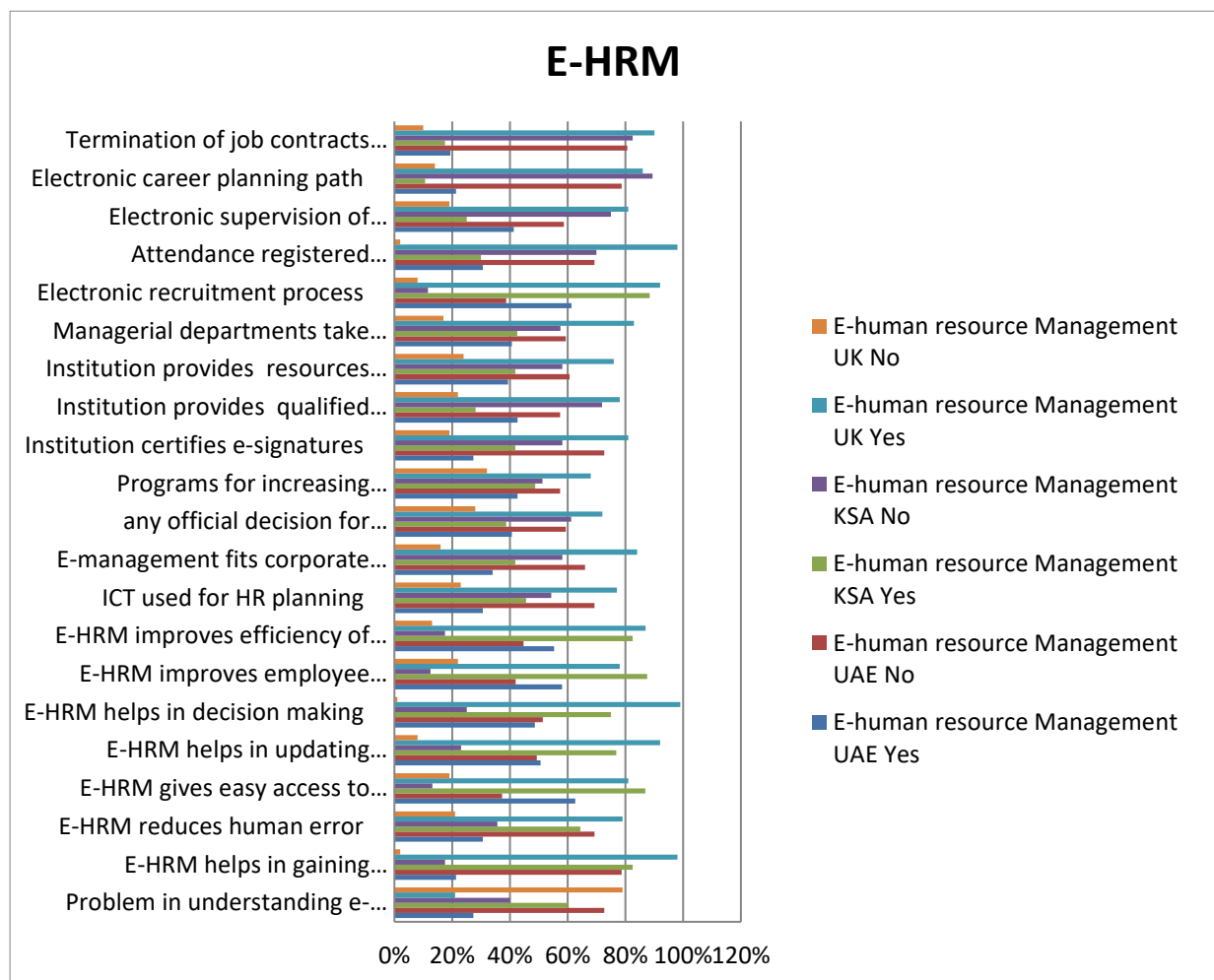
Figure 29: Represent results in UAE, UK and Saudi managers sections regarding E-HRM services.

6.10.2 Results Summary

- For the first time, the research uses the impacts index.

- The results for Saudi Arabia were uneven as some of the results were high or moderate, and the others were low.

- The results from managers were higher than those of other departments, and the reason may be that the most questions about human resources management.

- The results show that the concept of E-HRM management is clear for the managers in all three countries. Moreover, Saudi faces least issues of E-HRM that include the problem in understanding e-management. Moderately UK has more efficient E-HRM services for managerial staff. Comparing only Saudi and UAE, both face more issues of E-HRM in gaining competitive advantage.

- Saudi and UAE share the same opinion regarding reduce the number of visitors if the instantiation uses E-HRM. The reason for this may be the lack of confidence of the staff in electronic dealing or lack of experience.

- Saudi faces least issues of the role of E-HRM in accessing employee records as the result was even better than the UAE. However, not as close to the UK.

- The decision of transferring Saudi and UAE to the E-HRM must be made by the policymaker's in both countries. As it is clear from the results the of E-HRM that it's still not that efficient within the government institution in both Arab countries. That is probably because they are in the process of transition, but for Britain the situation is different.

- In the informational society, the term "electronic management" has become widespread in the administrative work in all sectors. Many countries have taken these techniques and introduced them in their institutions and announced the application of electronic management according to specific plans and objectives (Bondarouk, Ruël, and Parry, 2017). However, the use of these techniques does not help to achieve the desired objectives in the administrative work, without the availability of the human element able to use and benefit from them, and the availability of transparency in dealing with administrative information. The results show in the three countries the significance of the human element.

- Saudi shows that managerial operations are efficient. It also suggests that managers accept transformation in e-management. Moreover, this is a necessary factor to help

Saudi to transform into an information society. Also the results were positive from UAE and the UK.

- Although the results show that managers accept to switch to electronic management, not all managerial departments effectively contribute to transforming the organization into the e-management system.

- This decision to transforming the institution into e-management is important and necessary to speed the transformation of the Kingdom into an information society in full. And from the researcher, s point of view, there are Human obstacles that delay the transformation of government institutions to the e-management system.

- Saudi and UAE face least issues of increasing awareness for e-management, as their institution provides programmers to raise awareness of e-management among their staff and managers.

- The result of the officially certified e-signatures in Saudi and UAE proves that the service is available but still not widely used. The reason could be the nature of the employees in Arab countries as some of them prefer the traditional signature. The reason could be the nature of the employees in Arab countries as some of them prefer the traditional signature.

- The results show that Saudi faces a serious problem of providing qualified staff for transition into e-management. On the contrary, in Britain and UAE, qualified staff are available at a high rate.

- Regarding Electronic recruitment process is clear that the service is available in Saudi institution but not used effectively, and it is less than the UK and UAE. The reasons, from the researcher's point of view, are the lack of confidence in the electronic system or frequent link failure.

- Hence, there is a need to address this critical issue by the management of educations and medical institutes within both countries. However, comparing all the three countries, the UK has the most efficient use of e-human resource management services as reflected from the favorable responses received.

- The overall results show that Saudi faces the same issues as the UAE in using electronic human resource management services, and the difference from the UK results in Saudi not providing qualified staff for the transition into e-management.

6.10.3 Obstacles to the transition to electronic management

- The first point is the lack of interest of administrator's staff in the applications of electronic management.

- The lack of legislation and regulations governing electronic management programmers to deal with cyber crimes and security breaches in the organizations.

- Resistance to change by some managers and people of power in the belief that the change to electronic management is a threat to their authority.

- Lack of administrative regulations and the regulation of electronic transactions between schools and the educational administration.

Figure 30: Represents results of managers' survey regarding E-HRM services, in UK, UAE, and KSA.

E-HRM services are of various types ranging from recruitment services to resignation and job specifications. Within UAE, managerial staff has been provided EHRM services

in terms of list of job openings (57%), update job specifications (16%), retirement or registration form (7%), online job application (16%) and sickness leave form (4%). On the contrary, managerial staff within KSA has been provided similar services but in different extent such as list of job openings (33%), update on job specification (20%), online job application (29%), retirement form (13%) and sickness leave form (5%). In contrast, the managerial staff in UK has been provided EHRM services in terms of list of job openings (87%), update job specifications (92%), online job application (98%), retirement or registration forms (81%) and sickness leave form (76%). Hence the comparison of all the countries, i.e., UK, UAE and KSA, shows that e-HRM services are most used in UK than in KSA and UAE.

6.11 Analysis and Discussions

This section aims at discussing the findings of both surveys while making a comparison between hospitals and educational institutions across Saudi Arabia, the United Kingdom and the United Arab Emirates. Moreover, a comparison of primary data findings with literature results has also been done critically.

6.11.1 E-communication

E-communication has been considered as a fast and easy way to communicate with others via electronic approaches such as email and video conferencing. This study found that e-communication approaches and services are provided by educational and medical institutions within Saudi, UAE, and UK (which is consistent with the study of Alshwaier, Youssef and Emam, 2012) as well as UAE (which is consistent with the study of Alturise and Alojaiman 2013). However, the extent of using and purpose of providing e-communication is different in all three countries. Individually, institutions within UAE and UK have excelled in delivering e-communication approaches such as e-mail accounts to academic staff, while in Saudi have also done the same but in half for medical and lower extent for academic respectively.

However, managerial staff within Saudi suggests that they are provided e-communication services by their organizations at a higher degree. Furthermore, the frequency of using e-mail services and other communication approaches among managers has been almost alike in all UK and UAE and lower in Saudi. However, the

purpose of using e-communication approaches differs across among academic staff UAE, UK, and Saudi. And managers across both countries. This finding suggests that managerial staff is more advanced in using e-communications services than those medical/academic staff members across Saudi. Even the educational sector has severe issues regarding e-communication whereas, in the UAE and UK ratios are not significantly different.

When organizations provide e-communication approaches, employees whether academic/ medical or managerial staff, become more efficient to communicate with others across the organization. However, the staff of both Arab countries, i.e., Saudi, and UAE requires training to use advanced technology for communication purposes also in the UK but at a lower rate. This outcome is consistent with the prior researchers, i.e., Challis, (2005) who has also noted that provision of technological approaches helps employees to improve their performance (Challis, 2005).

For providing an email account as well as use the e-mail for formal communication purpose, the higher percentage of respondents were from the UK. Moreover, Saudi results were the lower. For Saudi these results are considered a weak point in the system of electronic communication in Saudi institutions because of the state plan (2005) stipulated the transformation to the electronic system for all government institutions, and this cannot happen without providing an official email to each employee. This is problematic as email is a reliable and fast source of communication. According to Evance(2011) All communications occur via the communicator's account, which helps to provide some measure of confidentiality. The email also allows a communicator to send a message to more than one person at the same time (Evance, 2011), with additional improved services through e-mail reports. All these factors must be considered in the electronic communication system in Saudi Arabia.

And for other ways of electronic communication. Saudi medical institutions show an unexpected result; the result is higher than the results from the UK and UAE. However, in academic filed still high but less than the UK. In fact, in Saudi WhatsApp is consider a formal way to communicate. Moreover, according to all the Saudi sample of this study, it is considered more effective than the email. This result seems strange because the

organization's e-mail has an official character, while the WhatsApp is a personal application that does not carry the official role of the institution.

In UK academic institutions provides its employees with an email account and use it for formal communication reflected by a higher number of positive responses. This is in line with ITU's results and proves that the UK is a leading position for ICTs readiness.

E-Communication in the UK academic institutions is fully developed, and highly advanced, compared with the Arab countries in this study. The results show a massive difference between Saudi and UAE and UK. Also, they show that in Saudi the health sector provides electronic communications services for both (employees and managers), better than the educational area. Whereas, in the UK and United Arab Emirates the educational sector is superior.

For other ways of electronic communication, Saudi shows an unexpected result. In contrast, most of the institutions in the UK provides its employees with an email account for formal communication and official emails reflected by a higher number of positive responses.

The use of communication technology within the government makes it possible to transfer accurate information on time to the right person. E-mail is a useful means of transmitting and distributing information and documents, rather than printing and distributing them in the usual way.

Protection of data is essential since poor email habits can result in malware being downloaded onto company computers, which can wreak havoc with crucial files.

This result was reached by using the readiness indicator for question (1 and 3) and Usage/Readiness for questions number (2).

6.11.2 E-services

E-services are provided by organizations to assist their members in accomplishing tasks effectively and efficiently. This study found that academic staff with UAE has been provided higher access to e-services in terms of journals, whereas the UK has excelled

in delivering e-training programs in contrast, Saudi is less efficient in providing access to e-services training on electronic technology for academic /medical staff was higher in UAE than in Saudi but most senior in the UK. This finding is standard results. When employees are not provided adequate assistance in technology, they lack skills in using different approaches for their professional activities. The results indicate that academic staff members in Saudi have not been trained expertly through new technique; somewhat educational institutions still rely on traditional face-to-face training mechanisms.

Further, academic staff also revealed that their institutions provide e-recruitment services (>90% in UAE; >70% in Saudi; >81% in the UK). This implies that the recruitment process in the UK would be more efficient and fast as compared to that in UAE and Saudi owing to higher utilization of electronic approaches. However, electronic referrals to pensions, computerized assessment of training needs and training on usage of technology have been limited across Arab countries, i.e., Saudi, and UAE.

As far as managerial staff is concerned, this study found that e-services available to managers are better than those available to staff in KSA and UAE. The results of the UK for managerial or staff was better than that in UAE and Saudi. However, managers still lack adequate training in technology usage in Arab countries. This implies that a lack of training on different types of e-services and technology usage would deprive managers of developing relevant skills and expertise. This was also reflected in the survey that in Saudi managerial and staff faced 'lack of experience' as a major obstacle in using technology. When employees have not trained adequately, they lack experience and experience in technology; thus, consider it time- consuming to operate technological approaches. Consequently, their performance might reduce in the long run showing inefficiency of staff to complete the task in the best way in the least time. This outcome is consistent with the prior studies of Nguyen (2017) who have also noted that lack of training on technological approaches may affect the organization's performance (Nguyen, 2017).

In Saudi the health sector it is not well equipped with electronic services and is considered too far from what would be acceptable for a country wishing to be an information society compared to UK and UAE Where the health sector is fully equipped.

Also, the Saudi health sector is still advanced compared to the education sector; overall, the average answer was (50%). However, this result is still unsatisfactory due to the importance of electronic services and their role in the information society. Because of the use of E-services systems, the number of steps in the routines required to perform tasks has reduced. Provides automatic manual functions, reduces paper use and transfers transactions between employees, facilitates the use of electronic services, reduces the time it takes for the beneficiary to receive the assistance they need, provides accurate and timely data as needed and reduces the time it takes for the beneficiary to receive the service. Also, using the e-service can improve the way employees access services by providing self-service access through the automated Internet even outside official working hours.

Regarding the training needs for digital services, Saudi Arabia and the UAE suffer from a severe weakness in providing this service. Consequently, the lack of electronic training for employees will result in their lack of use of electronic services, which will hinder the progress of these countries from being information societies.

Although the results of providing e- training in the UK are not high compared to the rest of the results of e-services, they are much better than the results of the Arab countries. It may be that the results are not high because of the lack of personnel needs in Britain for electronic training. In Saudi and UAE because of the lack of e- training led to the difficulty in practice, which is the greatest obstacle.

In terms of e-services, both Arab countries lack video conferencing and video broadcasting for managerial and academic/medical staff which was comparatively good in the UK.

However, the status of e-recruitment is most active in the UK 100 % and comparatively strong in UAE where it is >90%; but it is >70% in Saudi.

This study revealed that using the e-services, such as access to electronic journals, databases, and electronic recruitment within the UK and UAE's better than Saudi.

Managerial staff results were better in Saudi.

Regarding obstacles, the lack of experience is the most significant obstacle faced by academics/medical in Saudi Arabia. The reason for this as shown by the results of the second question is the lack of electronic training provide from universities and hospitals. Also, the low level of people how speaks English in Saudi academic staff which may have affected their ability to use modern technology. Also, the lack of e-service provides by universities lead to a lack of experience and trust.

The health sector, in general, provides much better results than the education sector in Saudi. And the medical managerial results are higher than the all other results within Saudi. E-communication services are more organized for administrative staff within the UK and Saudi than in the UAE.

Overall, the medical staff in Saudi show results close to UAE. However, the UK is still ahead compared to the Arabs countries.

The e-services include four questions, relating to the ICTs indicators for measuring are (Usage-readiness-skill).

6.11.3 E-Learning

E-learning is associated with the provision of technology and related equipment to instructors as well as to learners. Although e-services and e-communication facilities are available to academic /medical staff within both countries, e-learning has been facing a challenging situation. This study found that the universities and hospitals both do not exhibit an appropriate link between e-learning and corporate strategy within the UAE, and Saudi.

The academic staffs need to have a well-structured strategy for e-learning that lacks in Arab countries. In today's competitive and globalized era, academics need to have access to electronic resources and databases for learning. In the absence of an adequate e-learning strategy, they would not be able to capitalize technology resources and reap maximum benefits. Although the UK has the best status responded in (Yes) as compared to UAE and then Saudi in terms of availability of e-education materials to academics, however, there is still an inefficient application of resources and technology.

Prior studies have noted that e-learning is useful in the presence of an appropriate strategy (Tucker and Gentry, 2009).

The overall results show that Saudi academic field greatly suffers from lack of e-learning services compared to the UAE and UK. However, in comparison of UAE and Saudi's results with the UK, there is increased use of e-learning in the UK. There are more excellent institutions that exploit advancement in technology and efficient use of e-learning technology in the UK. Also, the UK is better in providing e-education materials to its employees and using e-learning in their field than Saudi and UAE. For Saudi, that may be because of a problem in the development of educational curricula in electronic format, or issues in the infrastructure required for the dissemination of e-learning.

The results show that the majority of medical staff in Saudi and UAE had close results regarding the institutions' strategy of e-learning. And the institution's exploitation of technology advancement. This may be due to a lack of awareness without the administration of the importance of electronic learning and lack of familiarity with the requirements of these services.

However, the results also show that Saudi has the highest poor outcome (disagreement) for efficient use of e-learning technology and institutions exploiting advancement in technology and a clear strategy to provide e-education services. The reasons for this could be that the study environment in Saudi Arabia is not ready yet for this transformation, and this may be a reason why students do not get e-learning, and for lack of confidence in this type of education. Also, a fear of faculty members to reduce their role in the educational process and the transition of their position to the designers of educational software and the specialist technology of education may be a factor.

Overall, the Saudi medical sector provided a better result than academic areas, however, regarding the medical sector there is a considerable gap between the Arab countries and the UK while academic sector results in Saudi are lower compared to the other states.

Both Arab countries suffer from a lack of an appropriate link between corporate strategy and e-learning.

The e-learning includes five questions, covering (Readiness- skills and usages).

6.11.4 Scientific Research

Scientific research refers to the systematic analysis of scientific hypothesis and theories. A hypothesis refers to a proposition or assertion explanation of anything, that is based on the knowledge available, which is yet to be explained. This could also subject to more experimentation. Scientific research has been a very critical area for hospitals and University institutions as it leads to the development of drugs, diagnosis, new treatment techniques and solve for any problem, the new technology has played an essential role in governing scientific research due to the availability of educational materials and other resources on the Internet. This study found that medical staff within Saudi has been required to publish annually and submit research online. However, they still face obstacles while carrying research individuals. The Saudi staff are assisted by their institution in their research publications. In contrast, the UK provides requirements to academic staff to publish annually where they face fewer difficulties in conducting scientific research and publishing However, the Medical institutions in Saudi assist academic staff to publish their research online which is similar to the UK and better as compared to UAE. On the contrary, academic staff in Saudi has been found to face more difficulties while conducting scientific research than those in the UAE and UK.

This could be linked with the fact that Saudi lacks relevant resources and technical assistance to deliver e-learning and other materials. Moreover, academic staff in Saudi is given lesser access to databases and journals as those in the UAE and UK. Thus, they face more difficulty in conducting scientific research.

6.11.5 E-sources

E-sources refer to the materials and technical assistance given to individuals for accomplishing their relevant tasks. This study found that academic staff within both Arabic countries uses the internet as a primary educational resource, but comparatively, it is used less in the UK through the Internet, academic staff can have access to databases, journals, and other learning materials. However, medical institutions and hospitals within Saudi reveal a higher collaboration with other institutions for developing integrated databases than those in the UAE and UK. This collaboration could assist staff

within Saudi to conduct their research in a better way and enhance their performance considerably. This outcome is consistent with the prior studies of Nguyen, (2017) who has also revealed that appropriate collaboration among different institutes leads to competitive advantage and improved performance (Nguyen, 2017).

Finally, the nature of criteria for the selection of electronic resources available on the Internet in scientific research is a thorny issue, which is highly controversial among the researchers themselves, between supporters and opponents of their use in the first place, (Nguyen, 2017).

6.11.6 E-human resource Management

The development of technology has led to the emergence of the e-human resource management system that aims at the implementation of HRM policies, strategies and practices within the organization through support of technology (Zureikat, 2017). This study found that technical assistance has helped managerial staff within the three countries to understand e-management. This could be linked with the fact that managers staff in all three countries has been assisted through relevant programs to increase their awareness of e-management systems. In such cases, the managerial staff is more likely to achieve outcomes of EHRM such as faster processing, reduction in errors, and development of better work environment which is also consistent with the research of Zureikat, (2017). implementation efficiently to achieve the objectives for which they were applied.

Because the application of E-HRM means e-transformation from the traditional administrative model to a virtual model, that based on computers, the Internet, virtual knowledge, and the human elements which are qualified to deal with these technologies, this requires a strategic change in the components and business activities of the organization. The organization's traditional approach to digital connections based on communications technology, all of which impose a set of requirements.

1-Administrative requirements
E-management needs conscious e-management leadership that supports and the development and change of IT, is capable of innovating and reengineering organizational culture, and creating knowledge. Also, administrators should eliminate

the bureaucratic and routine procedures that hinder each development. The electronic management also requires the development and simplification of processes and work steps, which reduces the administrative burden and the linkage between all services to ensure the ease and flexibility of dealing between the institution, and employees with them, and the higher administrative bodies.

2-Technical Requirements

E-Management is a modern management method aimed at developing the performance of organizations in administrative work, but this current method requires the provision of the appropriate infrastructure for the implementation of e-management, so the foundation of hardware and software must be reviewed for the purpose. It is important to note in this aspect that institutions e-management must be linked to all modern electronic systems and communications networks and high-quality information because they are essential and necessary elements for the success its applications. Digital technology develops at high speed as its patterns vary, forcing management leadership to link its activities to information technology services and systems and modern electronic networking technologies such as the Internet, Intranet and Extranet (Kacst, 2015).

3-Human requirements

Training and qualification of staff, the employee, is the critical element of the transition to e-management, so it is necessary to train and qualify employees to accomplish the work through electronic means available. To achieve requires training courses for staff or on-the-job training.

4-Financial Requirements

The implementation of electronic management in government institutions is a massive project that requires large sums of money to achieve continuity and success and achieve the desired goals. Providing infrastructure, providing the necessary equipment, approaches, and electronic programs, updating them from time to time and preparing training programs for human elements requires a high financial cost. It is necessary to provide adequate funding for the shift towards electronic management, a

change that enables the start to achieve the desired goals with the efficiency that allows it to continue and support its clients.

5-Requirements related to information security

There is an urgent need to provide security methods and procedures to help protect information and data from penetration in the light of the technical revolution. Also, the increase in communications and information networks, especially after numerous attempts to penetrate computer systems for theft or destruction of information. All these factors have led to the introduction of many security programs to take defensive and preventive measures to protect and secure the privacy of organizations and individuals. Therefore, the implementation of electronic management requires the existence of electronic security methods and procedures to help protect information and data from penetration to maintain the confidentiality of information and data and not tampering with data.

Considering the above, the provision of these requirements is an indispensable necessity to ensure the success of the implementation of electronic management in universities and hospitals, and the need to provide management aware of the importance of adopting such modern technologies and seeking to deliver the requirements of their application within government departments. However, address all obstacles to adoption and enhance the awareness of employees and administrators will enable the introduction of information technology in a different management setting, and the development of adequate infrastructure for the work networks for the effective implementation of electronic management in general and E-HRM.

6.12 Analysis and discussions of Saudi results by indicators

6.12.1 E-Communication

The readiness index consists of two questions, the results from both samples (staff and managers) showed that the health sector is equipped with electronic communication by (55%) while the educational sector is provided with electronic communication for administration section by (50%) and only (25%) for other sections.

The usage/ readiness index consists of one question; the findings show that Saudi Arabia results are considered high and better than the results of the readiness index alone and the results of managers are higher than the results of employees. Also, the medical sectors provide more top results than academic for both (employees and managers).

Overall the result of usage index regarding managers in both sectors are high, and these results could be since the shift to use of the electronic system appeared in the administration before the rest of the sections.

The KSA results show that the medical sector has the best results in terms of readiness or usage indicators.

6.12.2 E-Services

The Readiness/usage indicators consist of one question. The results were good, as more than (50%) of the respondents regarding readiness indicator proving that the health sector is equipped and provides electronic services to employees. Also, the education sectors showed good results but not as good as the health sectors.

The question of providing training on the use of electronic services, the results were very disappointing for both sectors.

Usage indicator consists of one question. The results of the usage indicator showed that the sample uses electronic services provided even if the results, not more than (50%). However, regarding the managers' survey, the result was much better than the staff also the medical sectors was advanced.

The result usage/skills indicators show that the lack of experience is the number one obstacle that Saudi sample faced in every level. Again, the absence of training on the use of technology in the workplace has led to the emergence of this obstacle. Evidence of this is that this obstacle is almost non-existent in the UK's results. The results show that indicators are valid. Furthermore, the skills index indicates that Saudi employees need to develop their electronic skills.

Usage/skills Indicators consist of one question. The result usage/skills indicators show that the lack of experience is the number one obstacle that Saudi sample faced in every level. Again, the absence of training on the use of technology in the workplace has led to the emergence of this obstacle. Evidence of this is that this obstacle is almost non-existent in the UK's results. The results show that indicators are valid. Furthermore, the skills index indicates that Saudi employees need to develop their electronic skills.

Results are good for all indicators except for the training question.

6.12.3 E-Learning

Readiness indicator consists of two questions. Readiness Results show the E-learning service exists, but the results are not high.

It might because the institutions in Saudi Arabia do not have a clear plan for e-learning. Also, the availability of the e-learning materials in both sectors is good but not high.

The comparison suggests that e-learning and e-services are at the initial stage in all the Arab countries. However, the UK has a clear focus between corporate strategy and e-learning as identified by responses.

Usage Indicator consists of one question. The results of the Usage Indicator indicate a clear imbalance in the use of e-learning. In both sectors.

Usage/Skills indicators consist of two questions. The results of the usage/skills index for both sectors are disappointing, as the services of using e-learning in the field not exist, overall it is clear from the results that E- service is severely affected and may not be available due to the results.

6.12.4 E- Scientific research

Readiness Indicator consists of one question. The measurement index confirms that Saudi institutions are equipped with scientific research.

The results show that this service exists for more than half for the medical sector and less for the education sector.

Usage Indicators consists of two questions. The medical sector results of the usage index were good and indicated that the services are available but not used at a high level. Also, it is less in the educational sectors.

Usage index proved that there is no such service in the Saudi education sector that there were no data provided from the academic sector. But it is required in a small number in the medical sector.

Skills indicator consists of one question. The skills index proved that Saudi staff in both suffer significantly while they are carrying out their scientific research electronically. As the academic/medical staff within Saudi revealed more difficulties in conducting scientific research than those in UAE and UK. However, the severity of the challenges was less in the UK.

6.12.5 E- Sources

Readiness Indicator consists of one question. The readiness index proved that the Saudi institution was collaborating with others for an integrated academic database in an excellent way. In both sectors.

Readiness/usage index consists of one question; the results show that both sectors equipped and offer a friendly academic database which leads to ease to use it.

The Usage index consists of one question the results show medical staff is less for using the Internet as an academic source.

6.12.6 E-HRM

Readiness Indicators consist of five questions. Although some of the results in the readiness index indicate an apparent imbalance in the E-HRM of institutions in Saudi Arabia, the results of readiness index proved that the institution in Saudi Arabia is shifting to E-HRM and this is evidence of the effectiveness of the readiness indicator.

Impact Indicators consist of seven questions. This is the first time that the impact indicator has been used in this study and the results are all high, and the effect of the transformation to E-HRM has been demonstrated in the Saudi institutions' results.

Except in one question, but this does not prevent the recognition that the Saudi institution is rapidly turning to e-management.

The participants from all the three countries revealed the fit between e-management and corporate strategy.

Furthermore, this study also revealed that in Saudi and UAE managers do not participate much in the planning phase for moving the organization towards e-management.

Usage Indicators consist of one question. The results of the usage index are still lower than required but showed poor service in Saudi institutions, and it will help to develop solutions to improve the level of service.

The results for Saudi Arabia were uneven. Some of the responses were high or moderate, and others were low.

6.13 Summary

In this chapter, the researcher analyzed the data for the questionnaire, which consists of sections includes the electronic communication, e-services, e-learning, electronic scientific research, electronic resources, and e-administration (consists of the human resource department), because this is one of the first departments that applied electronically in Saudi. The results show different levels of readiness, use, and skills of staff from one section to another in the study.

The study also includes an analysis of the findings on the indicators of the individual issues in Saudi Arabia alone and the discussion about the results among administration in Saudi institutions. The study also included an analysis of the findings on the ICT indicators in Saudi Arabia alone and the discussion about the results.

Overall if the Kingdom wants to move to an information society at a pace that fits the planned plans and budgets, it is essential to pay more attention to this shortcoming and attempts to address it. The activation of the information society is not only dependent on the technical aspects such as hardware, software, networks, and trained personnel, but it is related to many aspects of society. This study found that Saudi not only

complaining of technical obstacles but also, they are facing another barrier such as lack of awareness and government bureaucracy. To overcome these obstacles, it is essential to measure the performance of the institutions by using all ICTs measurement indicators every year, and not only focusing on technical aspects but focus on the services quality, effectiveness and renewal to suit the needs of the information society. Also, focus on the human element which is a crucial element in achieving its goals. The material, financial, technological and organizational resources are essential to the availability of efficient, also the competent personnel to contribute to the competitive advantage, or efficient performance, of the institutions. Above all, it must be based on the importance of policymakers and their role in developing the performance of the sector electronically.

In Saudi, the management departments equipment is better resulting than the remaining departments, and management in the health field is better than the educational area.

In general, the health field is better equipped electronically than in all aspects covered by the study. It is true that the results were not the same as the results of the United Kingdom, but in most cases, they were close to the results of the UAE. This result confirms that the Kingdom is developing towards the transformation of an information society.

In Saudi, the medical sector in advance than the education sector based on the results of managers or employees.

The readiness indicators results are higher and better than the other ICTs indicators.

Saudi staff needs to develop their electronic skills to help the Kingdom to transform into an information society where the human factor is an essential factor in the transformation of an electronic society.

The researcher did not change the measurement indicators but used these indicators to measure the performance of the electronic system in institutions in Saudi Arabia. And she did not use the indicators in the way they were used before this study as there is no evidence that any research using the same way to measure the information society, and even the previous studies all indicate that the measurement of e-government. Also, this study uses ICTs indicators in a different way than other reports or research. For

example, the ITU use the ICTs indicators to measure the speed of the Internet or the number of mobile phones. So, it is true that the researcher in this study used the ICTs indicators, but the method of using them is different as the researcher measure the performance of institutions. The researcher has designed the questionnaire questions including all the ICTs indicators based on (Gardin, 2002) theory in order to measure tow areas of measuring information society based on (Webster, 2006) approach but these questions included different sections within the institutions in Saudi Arabia, and there is no evidence that these questions or the method of measurement were conducted before this study. However, these indicators to measure the information society any researcher can modify and use them to obtain accurate results. Therefore, this is the researcher main contribution to knowledge.

The results of this chapter met the aim of this study also met all project objectives and answered all research questions.

The next chapter is the study's conclusion, study's limitation, and study's contribution.

Chapter seven

Conclusion

7 .1 Introduction

The information society is now being used in academic and social terms, and as well as in the daily lives of individuals. In other words, the information or the modern society is said to be the one in which people find themselves inundated with concepts of information either through print or online media, including TV and Radio. In addition to this, there has been a global shift or improvement concerning technology and information sharing which has led to the creation and development of a new society known as an information society. The present information society's key feature includes the power to change how the world thinks or makes decisions. Individuals in information or modern society now share information, images, news and all different types of data by using the new technology (such as social media). Information and communications technologies have an essential role to play in promoting human, economic, social and cultural development because of its distinct and more efficient characteristics compared with traditional means of communication. These technologies pervade the geographical and political boundaries of countries to reach any point in the world better than the old communication method and are characterized by an abundance and diversity of information, and educational programs and for all segments of the population, available anywhere and anytime, and at low cost. The exact information is an essential source for people, for organizations of all kinds, and governments. It also plays a vital role in the development of the human element through the programs through which it is presented, such as training programs, and education programs. Therefore, it is necessary to pay attention to these technologies and develop their use effectively, with the training and education of individuals to use it, and to raising awareness of its importance, and the highlighting of its potential the problems.

This research has focused on measuring the development of Saudi Arabia as an information society by using ICT indicators in the educational and health sectors. The different indicators assessed in the research include e-services, E-HRM, scientific research, e-communication and e-learning. Using pilot study and questionnaire

approach for main study, the research has successfully achieved its overall aim, "to explore and measure the current state of Saudi Arabia as an information society". Through the results of the questionnaire, the researcher was able to present a reliable picture of the status of Saudi Arabia by measuring the performance of some educational and medical institutions in Saudi Arabia and then making a comparison of the current status of KSA's information society with UAE and UK. In relation to the achievement of objectives of the research, the following conclusions are drawn:

- With respect to the first objective, "To measure Saudi as an information society in specific sectors (health and education)", the research concludes that KSA has adequate use of information technology in health and education sectors, however, it is inferior to UAE and UK which are more technologically advanced and are using information communication technology with wider application. In particular this objective is concluded on the basis of outcome obtained from responses in the e-services, e-HRM, scientific research, e-communication and e-learning areas in UK, UAE and KSA.

- For the second objective, "To measure the willingness of Saudi people in using new technology". This object was achieved based on the results obtained from the questions related to the use and interaction of the employees and managers with the electronic services in the organization. The results were different among the three countries. As the results show the extent of knowledge and utilization of new technology among Saudi people, the research also concludes that Saudi people are willing to implement information communication technology to achieve wider benefits provided by its usage. However, several measures, such as training facilities, activating the use of e-mail as a means of official communication and measuring the effectiveness of these services and updating them by adding or cancelling services according to the need of the institution. All these steps are required to make KSA use ICT at fullest in the field of education and health.

- Concerning the third objective, "to compare the Saudi society with other societies with regards to technology adoption," the research concludes that other societies, mainly UK and UAE (analysed in this research) are quicker in adopting latest technology where KSA has been left behind. Nonetheless, Saudi Arabia has adopted technology

to an acceptable standard which needs to be improved to compete with other societies, particularly in the education and health sector.

- For the fourth objective, "to provide useful insights that can be generalized and used to measure the inclination and progress of any country towards becoming an information society' 'The fact that the research showed common factors in the three countries in terms of both developments and obstacles, and allowed a direct and meaningful comparison, shows that the method is applicable in very different contexts. Being based on generally applicable and widely accepted ICT indicators, the method should be able to be commonly applied in the future. Overall, this study showed measuring the information society involve selection of the indicators that are widely used to monitor the information society (Readiness, Usage, Impact, and outcome) and supplementing them with empirical indicators (for example, questions that provide insight into the areas of interest, whether political, social, technological, or the occupation). All these all the measurement stem from the analysis of information society provided by Webster.

- With respect for the first question 'What are the advantage and disadvantage of transferring to Saudi to an information society'? These results are applicable not only in the health and education sectors but also in all sectors in the Kingdom. An information society means a digital society. (Mcit.gov.sa, 2019). "Smart cities that control traffic and manage energy supply, enhancing the quality of life. New forms of entertainment delivered through digital platforms, and e-Health initiatives, make disease prevention the priority and provide more frequent access to doctors and nurses. Virtual classrooms, connecting young Saudis with the best educators, offer a step-change in the quality of education to harness the immense potential of the Saudi people." Ministry of Communications and Information Technology (2019). "Transformation plan". Retrieved from https://www.mcit.gov.sa/en

- There has been a phenomenal rise in the use of new ICTs across a range of government, commercial and private institution. More and more governments around the world are introducing electronic systems as a means of reducing costs, improving services for citizens and increasing effectiveness and efficiency in the public sector, and it is clear that the KSA must move in the same way. On the other hand, there are

some disadvantage as not everyone in Saudi has the knowledge and experience to deal with digital services. The transition to an electronic community that uses mainly digital services will force everyone to acquire skills for technology use. This will not be available to everyone, especially the elderly. Another point is the lack of confidence in people to enter their personal information; some feared that the Saudi government might use this for espionage and control of citizens and residents.

- For the second question 'to identify the obstacles were preventing Saudi Arabia from becoming an information society', the research concludes that responsiveness of education and health institutions to the adaptation of changing technology and needs are the major obstacles that have prevented KSA from becoming a true information society. For instance, lack of experience, time for response and lack of trust are three major obstacles that have hindered KSA's progress from becoming an information society. Moreover, education and health institutions have failed to provide re-training programs on the website. They do not use interactive video conferencing and video broadcasting services online, does not upload videos online for staff training, less focus on identification of training needs electronically, does not provide training on the use of technology, and lesser use of e-services by the institutions are the most common obstacles in KSA.

- Regarding the third question, 'Which indicators can be used to measure the ICT infrastructure'? This study has focused on measuring the extent of the development of the electronic system by measuring the services provided and the area of effectiveness. The results showed that the services were available contexts studied, but the rate of use is weak and revealed the absence of other services and the best example, the lack of e-education materials available to websites.

- Regarding the fourth question, 'Which indicators can be used to measure the ICT use'? Measuring the indicators of use often involves the measurement of the interaction of users with the services. This study provided a set of questions that helped to measure the interaction between the employees and managers with the development of technology in government institutions and revealed the shortcomings of the electronic system. This helps to understand how it may be improved.

- With respect to the fifth question,' Which indicators can be used to measure the ICT skills'? These indicators measure the skills of the employees in dealing with the electronic system in the universities and hospitals in the three countries. Through the

answer's weaknesses were clarified. Therefore, it is possible to identify solutions from the researcher, the solutions are to improve the quality of educational curricula and then to improve the quality of training programs, taking into account the current and necessary capabilities of staff in dealing with modern technology.

Overall, the research results provide answers to all the research questions. So, based on these results, these questions proved that they are useful and valid to use, in achieving the overall aims of the study.

However, to transform the Kingdom into an information society, the transition policymakers should know that development of plans and programs is not the best way to change and is not enough. It is necessary to measure the performance of the institutions, the quality of the services provided and the extent of the interaction and skills of the employees and people in using these services. However, for this to happen, the Kingdom's policymakers should ensure that this transformation is carried out smoothly and correctly. And they must focus on the following points:

- Transferring Saudi Arabia to information society cannot be delivered by the government alone. It must be done through collaboration with the Saudi people. The Saudi government must invest heavily in skills, ensuring the people of the Kingdom develop the know-how to create and innovate. This can be done, first by making technology available to everyone, second by improving the quality of education and the quality of training and finally by establishing a strict law to protect the personal information of users.

- "To create an information society that can only be built on a strong digital foundation. In this case, it means expanding the new technology to deliver e-services more effectively. Giving citizens the opportunity to engage with government constructively, crowdsourcing ideas and generating the feedback that will help shape the future of the Kingdom. Which will create a culture of digital volunteerism, thus allowing people to give back by leveraging new technology." Ministry of Communications and Information Technology (2019). "Transformation plan". Retrieved from https://www.mcit.gov.sa/en

Therefore, the use of ICT measurement approach is crucial for policymaking. It helps policymakers to evaluate the efficiency of their actions and to reinforce the accountability

of public interventions. The demand for new data and measurement approaches is unusually high in the case of digital information, because of its growing role in everyday life and the fast pace of change.

Although, the present status of Saudi reflects that it is taking measures to implement communication technology, particularly in education and health sector. As indicated by research results, which could successfully make KSA a full information society in the next few years. Generally, the Kingdom is witnessing a remarkable development in electronic transformation in all state facilities, with the desire of the government to become an information society by the year 2030 asset in the Saudi national plan (2017). The best example of this is that today all the ministries in the Kingdom provide electronic services to facilitate government transactions for beneficiaries, such as 'Absher' which is provided by the Ministry of Interior. According to the definition of the ministry, this is a comprehensive platform for electronic services. 'Absher' is applied a lot in the completion of government transactions, as 60 distinct services are provided by the application, including the issuance of passports, renewal of work contracts, and many others. These are services which took much time and effort in the past, for example, issuing a Saudi passport through the application now takes 24 hours, whereas in the past, it took a week.

The results of this study also, showed that the Kingdom is taking steady and correct steps towards becoming an information society. On the other hand, the researchers concluded that some of the results show that Saudi Arabia still lags. Although, with efforts to become a complete information society, progress was not as quick and efficient as envisaged in the state plan for transformation. It is clear from the study results that not all the electronic services are at the required level, but most of the disappointing results were related to the use of services and the user skills.

Overall, the measurement of the information society is essential to monitoring the development of any country and requires a national statistical system that enables the presentation of measurement indicators, which are usually primary data indicators, including indicators related to human development, equipment and informational institutions, and indicators of the intensive use of this technology.

7.2 Limitations

The main limitations of the research are those associated with the practical details of the surveys.

The inconsistency in survey distribution, with some surveys distributed in paper form rather than online, may lead to differences in response.

Because of a lack of fluency in the English language of some participants in the UAE and Saudi Arabia, the researcher had to translate and explain the questions, potentially leading to bias.

There was a lack of cooperation from some groups within the study sample in UAE and Saudi Arabia; the reason may be the Arab culture lacks respect for academic study and does not believe that such research can help to solve practical problems. This led to some completed responses having to be discarded, as the answers were incomplete or unhelpful.

The reliance on questionnaires, rather than face-to-face interviews, limits the detailed information which could be obtained This is because the interview approach used during the pilot study could not be carried forward into the main study, because of inconsistency of results. This was due to concerns among the participants that their statements might be seen and viewed unfavorably by high ranked government officials.

More generally, the research could only take a snapshot of the situation at the point in time when the analysis was carried out. The progress over time in the development of Saudi information society had to be assessed from literature sources, rather than by comparison of data collected at different times.

In summary, the main limitations of this study were those of methodology as noted: a restricted set of data collection methods, with relatively small sample sizes, carried out within a short time-frame. Despite these limitations, the study has enabled the development and validation of a new approach to the investigation of developing information societies.

7.3 Main contributions of the study

The concept and the reality, of the information society, is essential as a science within information science. For the researcher evolution in the study of information society within information science is not only the discovery of new concepts and theories but also in finding ways to measure the development of information society.

This study makes two main contributions to the theory and practice of information science, and particularly to the study of the information society: one specific, and one more general.

Specifically, this is the first of such study of the information society in Saudi Arabia, and indeed in the Arab world and the Middle East. It has the potential to be of value to policymakers in Saudi Arabia in two ways.

First, it provides an objective snapshot of the present stage in the country's development towards information society by enhancing the construct validity of key measures using refined multiple-item measures and the use of measurement approaches that do not rely on self-reports.

Second, it provides an approach for measuring continuing development regularly.

In term of theoretical contributions, the researcher has integrated two theories which the researcher considers to be the most important theories related to understanding and the measurement of the information society. The first theory is Webster's theory, which defines the sectors through which the information society can be measured. The second theory is the overarching illustration of the indicators that used to measure the information society by a survey, based on a framework of generally accepted ICT indicators and the theories of Webster and Gardin. This is the first time that a set of ICT indicators has been used in this way, to generate a survey approach. This is potentially applicable to analyzing and comparing the development of information society, over time in any context, between many countries and regions at any one time.

In term of methodological contributions, the study presents a new and general method for analyzing the development of information society. As this study includes a sample

of three different countries, with very different cultural, educational and job skills; it will allow the application of this method to any society.

Finally, the evidence found that no study to date has focused on using the ICTs indicators for measuring the information society, in occupations and new technology by measuring the digital service and how the Saudi staff and managers use these services in government institutions. Hence this study can be considered as one of the pioneer studies in this area. This study has made a novel contribution to the field of measuring the information society and has expanded the boundaries of knowledge, especially for governments that are seeking to develop their communities to an information society.

7.4 Future research

This study has necessarily given a 'snapshot' of the state of information society in Saudi Arabia at the time of the study. Repeating the survey, perhaps every year or every two years, could give a picture of the pattern of development of information society in the country.

Carrying out surveys using the methodology in a wider selection of countries and regions, and in particular comparing it with studies carried out by other methods, could validate the survey/indicator method developed here. If found to be generally useful, the method should be refined and updated by incorporating new sets of ICT indicators as they are developed, and as existing indicator sets are revised.

In terms of action research, the methods could be promoted to national authorities, particularly in Saudi Arabia and similar countries, as an objective measurement of information society development, which could have the potential to influence public policy in the more effective use of information, and information systems.

However, As the Saudi government ministry of communications and IT says transferring Saudi Arabia to information society cannot be delivered by government alone. It must be done through collaboration with the private sector, young people and new entrepreneurs. The MCIT will lay the foundation for digital transformation and create the conditions to make it possible. We will also call upon the collective effort, creativity and entrepreneurial spirit of the Saudi people to make it happen. That is why our approach

is underpinned by one, clear principle: putting citizens, innovators and job creators first (Mcit.gov.sa, 2019). However, it is hoped that this research study will assist these aims.

References

- Abboud, R. (2018). *Arabic Digital Content.* Amman: Dar Almanhal.

- Abd-alhadi, M. (2015). *Introduction to information Science.* 13 the ed. Cairo: Dar Grib.

- Algohary, A. (2013). *Introduction to Information Society.* 2nd ed. Beirut: Dar Aldefafa.

- Ajala, E., Ojo, S. and Olugbara, O. (2013). Survey of Information Society Measurement. *International Journal of Computer and Information Technology, 02* (04), pp.798-808.

- AKarma, F. (2012). Obama's victory factors win and decisiveness, Jeddah: King Abdelaziz media and press center, pp. 5-15*.* [Online] Available at: http://www.alarabiya.net/articles/2012/11/07/248216.html [accessed 13 May. 2017].

- Al- Ali, M. (2011). *The Information Challenge.* Cairo: Dar Al Shroq.

- Alali, A. (2107). *The information ages.* AL Riyadh*.* [Online] Available at: http://www.alriyadh.com/25587 [Accessed 12 Jan. 2017].

- Alaloy, H. (2006). Measuring the information society in Algeria. *Information Studies*, 1 (04), pp.14-25.

- Al-Dafa, B. (2010). *Information Society Today*, Research paper. Riyadh: Kind Saud University.

- Al-garfai, H. (2008). The basic to build an Arabic information society. *Albasra,* 1 (46), pp. 326-342.

- Ali, A. (2016). Obstacles of E- learning. *Journal of Electronic Education,* 1(2), pp. 3-5.

- Almaraee, M. (2016). *Scientific Research in Saudi Universities: Reality and Ambition.* [online] Eajournals.org. Available at: http://www.eajournals.org/wp-content/uploads/Scientific-Reserch-In-Saudi-Universities-Reality-And-Ambition.pdf [Accessed 2 Apr. 2019].

- Alkahtani, H., Dawson, R. and Lock, R., (2013). *The impact of culture on Saudi Arabian information systems security. IN: Georgiades.*, Ross, M. and Staples, G. (eds.) Proceedings of the 21st International Conference on Software Quality

Management (SQM 2013), Quality Comes of Age: Southampton, 2013, pp. 201 - 210.

- AL- Khory, A. (2013). E-Government UAE. Conference Proceedings, Information society, Istanbul pp.55-76.

- Al- Lily, A. (2015). Information Thinness: Saudi Arabia. *The Information Society*, 31, (5), pp.407-413.

- Al-Maliki, S. (2013). Information and Communication Technology (ICT) Investment in the Kingdom of Saudi Arabia: Assessing Strengths and Weaknesses. *Journal of Organizational Knowledge Management,* 30 (1), pp .1-15.

- AL-Shehry, A. (2008). *Transformation towards E-government in the Kingdom of Saudi Arabia: Technological and Organizational perspectives.* PhD. De Montfort University. [online] Dora.dmu.ac.uk. Available at:
    https://www.dora.dmu.ac.uk/bitstream/handle/2086/2418/e-thesis%20transformation%20to%20e
    government.pdf?sequence=1&isAllowed=y [Accessed 23 Feb. 2019].

- Alshehri, M. and Drew, S. (2010). Challenges of e-Government Services Adoption in Saudi Arabia from e-Ready Citizen Perspective. *Journal of World Academy of Science, Engineering and Technology*, 4 (6), pp.255-267.

- Alshwaier, A., Youssef, A. and Emam, A. (2012). Department of Advanced Computing. *An International Journal (ACIJ*), 3 (1), pp. 82-100.

- Alturise, F. and Alojaiman, B. (2013). Benefits and challenges of using ICT in Saudi Arabia universities: A literature review. *International Journal of Information Technology & Computer Science*, 11(2), pp.46-55.

- Askar, A. (1989). *Introduction in the Scientific Research*. Kuwait: Al flah press.

- Awed, R. (2015). E-HRM. *International Journal of Information Technology & Computer Science*, 14 (2), pp. 77-85.

- Balkin, J. (2004). Digital speech and democratic culture: A theory of freedom expression for the information society. *NYUL rev.*, Publishing Limited, *79* (1), pp. 22-30.

- Babbie, E. (2010). *The Practice of Social Research.* 12 the ed, USA: Wadsworth.

- Barnes, P. (2005). *The History of Information and Communication Technology*. New York: NYU.

- Bawden, D. and Robinson, L. (2012). *Induction to Information Science*. London: Facet.

- Bawden, D. (2014). Norming the information society. *Journal of the Association for Information Science and Technology*, 65(11), pp.2376-2377.

- Bcs.org. (n.d.). *Data Centre Specialist Group | Specialist Groups | Member groups | Membership | BCS - The Chartered Institute for IT*. [online] Available at: https://www.bcs.org/category/18286 [Accessed 22 Dec. 2018].

- Bell, D. (1973). *The coming of post-industrial society: a venture in social forecasting*. New York: Basic Books.

- Berg, L. (2007). *Qualitative research methods for social sciences*. [Online] Available at: http://www.social.uci.edu/ssarc/pcs/webdocs/syllabuswo9.pdf [Accessed 22 Feb .2013].

- Bernard, R. (2006). *Research Methods in Anthropology: qualitative and quantitative Approaches*. 4th ed, Oxford: Altamira Press.

- Black, A., Muddiman, D. and Plant, H. (2016). *The early information society*. Abingdon, Oxon: Routledge.

- Blessing, L. and Chakarbarti, A. (2009). *DRM: A Design Research Methodology*. London: Springer.

- Bondarouk, T. and Ruël, H. (2009). Electronic Human Resource Management: challenges in the digital era. *The International Journal of Human Resource Management*, 20 (3), pp. 505-514.

- Bondarouk, T., Ruël, H. and Parry, E. (2017). *Electronic HRM in the Smart Era*. Bingley: Emerald Publishing Limited.

- Booth, W., Colomb, G. and Williams, J. (2008). *The Craft of Research.* Chicago: University of Chicago.

- Boyer, K., Hallowell, R. and Roth, A. (2002). E-Services: Operating Strategy-a Case Study and a Method for Analyzing Operational Benefits, *Journal of Operations Management*, 20 (2), pp.88-175.

- Bryman, A. and Bell, E. (2016). *Social research methods*. Oxford: Oxford University Press.

- Bullen, M. and Janes, D. (2007). Making the transition to e-learning? Edited by Mark Bullen & Diane P Janes. *British Journal of Educational Technology*, 38 (4), pp.762-762.

- Cabinet Office. (2011). *Government ICT Strategy*. [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/85968/uk-government-government-ict-strategy_0.pdf [Accessed 22 Oct. 2018].

- Cabinet Office. (2017). *Policy paper Government Transformation Strategy*. [online] Available at: https://www.gov.uk/government/publications/government-transformation-strategy-2017-to-2020/government-transformation-strategy [Accessed 22 Jan. 2019].

- Castellsm, M. (2007). Communication, Power and Counter-power in the Network Society. *International Journal of Communication,* 1 (1), pp. 238-266.

- Challis, Di. (2019). *Committing to quality learning through adaptive online assessment. Assessment & Evaluation in Higher Education.Learntechlib.org. Learn Tech Lib: Search Results*. [online] Available at: https://www.learntechlib.org/results/?q=author%3A%22Di%20Challis%22 [Accessed 8 Mar. 2019].

- Citc.gov.sa. (2017). *Annual Report*. [online] Available at: http://www.citc.gov.sa/ar/mediacenter/annualreport/Documents/PR_REP_013A.pdf [Accessed 27 Mar. 2019].

- Cohen, L., Manion, L. and Morrison, K. (2011). *Research Method Education.* 7th ed. Coulthard: Routledge.

- Creswell, J, Clark, V. (2010). *Understanding Mixed Methods Research.* 2nd ed, London: Sage.

- Creswell, J. (2014). *Research design*. Los Angeles: Sage.

- Datacenterdynamics.com. (n.d.). *Data center industry news, analysis and opinion - DCD*. [online] Available at: https://www.datacenterdynamics.com [Accessed 11 Jan. 2019].

- Dean, A. (2004) *Aftab's Booklet.* Huddersfield, West Yorkshire: University of Huddersfield.

- Degele, N. (2010). Knowledge in the Information Society: World Futures. *The Journal of Global Education,* 50 (14), pp. 743-755.

- DIGIT-ICT Conference. (2014). *ICT 2014 - DIGIT-ICT Conference - European Commission.* [online] Available at: https://ec.europa.eu/digit-ict/en/content/ict-2014/ [Accessed 24 Jun. 2015].

- Duff, A. (1998). Dauled Bell's theory the information society. *Information Society Journal,* 26 (6), pp. 343-373.

- Duff, A. (2000). *Information Society Studies.* London: Routledge.

- Duff, A. (2012). *A Normative Theory of the Information Society.* London: Routledge.

- Duff, A. (2013). *Information Society Studies.* London: Routledge.

- Ec.europa.eu. (2011). [online] Available at: https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/pdf/key_documents/2011/package/tr_rapport_2011_en.pdf [Accessed 22 Aug. 2013].

- Ec.europa.eu. (2014). [online] Available at: https://ec.europa.eu/eurostat/documents/341889/725159/OECD+Manual+Measuring+the+Digital+Economy/6418c566-4074-4461-9186-9ad509bc4a4d [Accessed 26 Mar. 2018].

- Everett, D. (2012). *Language: The Cultural Tool.* London: Profile Books.

- Estaenergy.org.uk. (n.d.). *ESTA (energy services and technology association).* [online] Available at: https://estaenergy.org.uk/ [Accessed 11 Jan. 2019].

- Evans, F. (2011) Email Is (Still) Important and Here Is Why? *Smashing Magazine.* [Online] Available at: https://www.smashingmagazine.com/2011/07/email-is-still-important-and-here-is-why/ [Accessed 12 Mar. 2019].

- Evanschitzky, H. and Iyer, G. (2007). *E-Services.* Wiesbaden: Deutscher University several.

- Fatani, R. (2011). *Securing internet rights in Saudi Arabia.* Jeddah: *GIS Watch org.* Retrieved 15 November 2016. [Online] Available at: https://www.giswatch.org/en/countreport/internet-rights/secure internet-rights-Saudi-Arabia. [Accessed 2 Mar. 2017].

- Floyd, and Fowler, J. (1994). *Survey Research Methods.* London: Sage.

- Fuchs, C. and Sandoval, M. (2014). *Routledge Studies in Science, Technology and Society.* New York: Routledge.

- Gil-García, J., Pardo, T. and Luna-Reyes, L. (2018). *Policy Analytics, Modelling, and Informatics.* Cham: Springer.

- GOV.UK. (n.d.). *Income Tax rates and Personal Allowances.* [online] Available at: https://www.gov.uk/income-tax-rates [Accessed 12 Jan. 2019].

- GOV.UK. (n.d.). *Planning permission.* [online] Available at: https://www.gov.uk/planning-permission-england-wales [Accessed 11 Jan. 2019].

- Green, L. (2002*). Communication, Technology and Society.* Australia: Allen & Unwin.

- Gripenberg, P., Skogseid, I., Silli, F. and Tuunainen, V. (2004). Entering the European information society: Four rural development projects, *The Information Society: An International Journal*, 20 (1), pp. 3-14.

- Guerin, L. (2017). *Smart policies for workplace technologies.* 5th ed. Berkeley: Nolo.

- Hajela, S. (2010). *Regional progress and strategies towards building the information society in Asia and the Pacific.* New York: United Nations Economic and Social Commission for Asia and the Pacific.

- Hammersley, M. (2011). *Methodology.* Los Angeles, Calif.: SAGE.

- Horton, W. (2006) *E-Learning by design.* San Francisco: Pfeiffer.

- Hong, J., and Huang, L. (2005). A split and swaying approach to building information society: the case of Internet cafes iChina. *Telematics and Informatics*, *22*(4), pp. 377-393.

- Internetworldstats.com. (2016). *Middle East Internet Stats and Telecommunications Reports.* [online] Available at: https://www.internetworldstats.com/middle.htm [Accessed 23 Jun. 2018].

- Itu.int. (2005). *Saudi Arabia as an information society*: Communications and Information Technology Commissi. .Digi*tal reach report,* 1.

- Itu. int. (2010). *ICT Development Report- Monitoring the WSIS targets*, 9th ed, pp,1 [Online] Available at: http://handle.itu.int/11.1002/pub/803655cd-en [Accessed 3 OCT.2013].

- Itu. int. (2013). *Measuring the Information Society.* [Online] Available at: http://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-ICTOI-2013-SUM-PDF-E.pdf [Accessed 2 Oct .2013].

- Itu.int. (2015). *Partnership on Measuring ICT for Development.* [online] Available at:
  https://www.itu.int/en/ITU-D/Statistics/Pages/intlcoop/partnership/default.aspx [Accessed 27 Jan. 2019].

- Itu.int. (2017). *ITU | 2017 Global ICT Development Index.* [online] Available at: https://www.itu.int/net4/ITU-D/idi/2017/index.html [Accessed 14 Mar. 2018].

- Itu.int. (2017). *ITU | 2017 Global ICT Development Index.* [online] Available at: https://www.itu.int/net4/ITU-D/idi/2017/ [Accessed 26 Mar. 2019].

- Itu.int. (2017). *ITU | 2017 Global ICT Development Index.* [online] Available at: https://www.itu.int/net4/ITU-D/idi/2017/#idi2017comparison-tab). [Accessed 6 Sep. 2018].

- Itu.int. (2017). *ITU | 2017 Global ICT Development Index.* [online] Available at: https://www.itu.int/net4/ITU-D/idi/2017/ [Accessed 26 Mar. 2019].

- Itu.int. (2017). *ITU | 2017 Global ICT Development Index.* [online] Available at: https://www.itu.int/net4/ITU-D/idi/2017/#idi2017comparison-tab). [Accessed 6 Sep. 2018].

- Itu.int. (2017). *ITU | 2017 Global ICT Development Index.* [online] Available at: D/Statistics/Documents/publications/misr2017/MISR2017_Volume2.pdf [Accessed 22 Oct. 2018].

- Jakobs, K. (2007). *Standardization Research in Information Technology.* London: IGI Global.

- Jandt, F. (2010). *An introduction to intercultural communication.* Los Angeles: Sage.

- Javalgi, G., Martin, L. and Tood, R. (2004). The export of e-services in the age of technology transformation: challenges and implications for international service providers. *Journal of Services Marketing*, 18 (7), pp.560-573.

- Kacst. (2015). *Saudi transfer to information society.* [Online] Available at: http://publications.kacst.edu.sa/SystemFiles/Books_Pdf/PDF_6354880136783833 07.pdf [Accessed2 7 Oct. 2014].

- Kacst.edu.sa. (2018). *Research and Development KACST.* [online] Available at: https://www.kacst.edu.sa/eng/RD/Pages/content.aspx?dID=55 [Accessed 29 Mar. 2019].

- Khan, B. and Ally, M. (2015). *International handbook of E-learning.* New York: Routledge.

- Kaplan, B. and Duchon, D. (1988). Combining Qualitative and Quantitative Methods in Information System Research: A Case Study. *MIS Quarterly,* 12 (4), pp. 571-587.

- Karvalics, L. (2007)*. Information society -What is it exactly?* [Online] Available at: http://www.ittk.hu/netis/doc/ISCB_eng/02_ZKL_final.pdf [Accessed 23 Jan. 2014].

- Karvalics, L. (2009). *Information society dimensions.* Szeged: JATE Press.

- Kerlinger, F. (2000) *Foundations of Behavioral Research*, 4th ed. New York: Holt, Rinehart and Winston.

- King Abdelaziz City for Science and Technology. *Information security Technology.* [Online] Available at:
  https://www.kacst.edu.sa/eng/RD/Pages/content.aspx?dID=55 [Accessed12 Jan .2017].

- King Abdelaziz City for Science and Technology. *Smart Hospital.* [Online] Available at: https://www.kacst.edu.sa/eng/RD/Pages/content.aspx?dID=55 [Accessed 24 Jan .2017].

- Kling, R. and Berleur, J. (2007). *Social informatics: an information society for all?* Berlin: Springer.

- Kumar, R. (2014) *Research Methodology a Step by Step Guide for Beginners,*5th ed London: Sage Publication.

- Lepak, D. and Snell, S. (1998). Virtual HR: Strategic Human Resource Management in the 21stCentury.*Human Resource Management Review*, 8, (3), pp. 215-234.

- Long, S. (2012). *Virtual work and human interaction research.* Hershey, PA: Information Science Reference.

- Lowrance, W. (2012). *Privacy, confidentiality, and health research.* Cambridge: Cambridge University Press.

- Lyon, D. (1988). *The Information Society,* Cambridge: Polity Press.

- Machlup, F. (1962). *The production and distribution of knowledge in the United States.* Princeton: Princeton University Press.

- Madini, A. and de Nooy, J. (2014). Cross-gender communication in a Saudi Arabian Internet discussion forum: Opportunities, attitudes, and reactions. Convergence: *The International Journal of Research into New Media Technologies*, 1-17

- Mahan, A. and Misnikov, Y. (2004). *Introduction: Basic Principles from Lessons Learned' in How to Build Open Information Societies: A Collection of Best Practices and Know-How. UNDP and Europe and the Commonwealth of Independent States.* Slovakia: UNDP.

- Mahana, M. (2017). Saudi as an information society. *Journal of Information Science*, 45 (2), pp.17-36.

- Mansell, R. and Steinmueller, W. (2002). *Mobilizing the Information Society.* Oxford: Oxford University Press.

- Mansell, R. (2009). The *Information Society.* New York: Routledge.

- Mansell, R. (2012). *Imagining the Internet.* Oxford: Oxford University Press.

- Marowist, R. (2016) Telecommuting growing as companies look to save money, respond to employees. [Online] Available at: https://www.cbc.ca/news/business/telecommuting-growing-as-companies-look-to-save-money-respond-to-employees-1.3596420 [Accessed 22 Dec. 2016].

- Martin, B. (2005). Information society revisited: from vision to reality. *Journal of Information Science*, 31(1), pp.4-12.

- Martin, W. (1988). *The information society.* London: Aslib.

- Masadi, A. (2015). [online] Available at: https://www.business2community.com/tech-gadgets/importance-information-technology-business-today-01393380 [Accessed 21 Mar. 2018].

- Mason, M. (2012). Forum*: Qualitative Social Research.* [Online]

- Available at: scholar.google.co.uk/scholar [Accessed 22 Oct .2013].

- Masuda, Y. (1981). *The information society as post-industrial society*. Tokyo: World Future Society.

- Matwly, N. (2012). *Saudi As Information society.* [Online] Available at: http://www.prof-nariman.com/index.php/prof-nariman/557 [Accessed 3 Mar .2013].

- May, S. (2002). *The Information Society.* Cambridge: Polity Press.

- Mazzara, S. (2016)*. The Important of E-Learning in Teaching.* Dorset: Arcane.

- Menou, M. and Taylor, R. (2006). A Challenge Measuring Information Society. *The Information Society: An International Journal*, 22 (5), pp. 261-267.

- Meyers, L., Gamst, G. and Guarino, A. (2013). *Performing Data Analysis Using IBM SPSS*. New York: John Wiley & Sons Inc.

- *Middle East Internet Usage Stats and Facebook Statistics*. (2016). *Internetworldstats.com*. Retrieved 15 November 2016, Available at: http://www.internetworldstats.com/middle.htm [Accessed15 Oct. 2016].

- Miles, M., Huberman, A. and Saldaña, J. (2014). *Qualitative data analysis*. Los Angeles: Sage, p.94.

- Mcit.gov.sa. (2013). *Annual Report*. [online] Available at: http://www.citc.gov.sa/en/mediacenter/annualreport/Documents/PR_REP_009En g.pdf [Accessed 10 May 2018].

- Mcit.gov.sa. (2014). *Annual Report*. [online] Available at: http://www.citc.gov.sa/en/mediacenter/annualreport/Documents/PR_REP_010En g.pdf [Accessed 13 May 2018].

- Mcit.gov.sa. (2015). *Annual Report*. [online] Available at: http://www.citc.gov.sa/en/mediacenter/annualreport/Documents/PR_REP_011En g.pdf [Accessed 5 Mar. 2018].

- Mcit.gov.sa. (2016). *Annual Report*. [online] Available at: http://www.citc.gov.sa/en/mediacenter/annualreport/Documents/PR_REP_012En g.pdf [Accessed 11 Jun. 2018].

- Mcit.gov.sa. (2015). *Ministry of Communications and Information Technology*. [online] Available at: https://www.mcit.gov.sa/en [Accessed 22 Jan. 2019].

- Nagaraj, M. (1998). *Right to information*. Calcutta: Indian Association of Special Libraries & Information Centers.

- Newing, H., Watson, C., Puri, R. and Eagle, C. (2010). *Conducting research in conservation*. London: Routledge.

- Nguyen, G. and Jollès, M. (2005). *Dose the European Union Greater the Foundation of an Information Society*. [Online] Available at: http://www.coleurop.be/content/studyprogrammes/eco/publications/beeps/beep11 .pdf [Accessed 15 Nov. 2016].

- Nguyen, H. (2017). How Collaborative Culture Supports for Competitive Advantage: The Mediating Role of Organizational Learning. *International Journal of Business Administration*, 8 (2), pp. 2-73.

- OECD. (2011). *Measuring the Information Society. [Online]* Available at:http://www.keepeek.com/Digital-Asset-Management/oecd/science-and-technology/oecd-communications-outlook-2011_comms_outlook-2011-en#page1 [Accessed15 Oct. 2013].

- OECD. (2018). *Information and communication technology (ICT) - ICT value added - OECD Data.* [online] Available at: https://data.oecd.org/ict/ict-value-added.htm [Accessed 26 Sep. 2018].

- OECD. (2018). *Information and communication technology (ICT) - Internet access - OECD Data.* [online] Available at: https://data.oecd.org/ict/internet-access.htm#indicator-chart [Accessed 26 Sep. 2018].

- OECD-ilibrary.org. (2018). *OECD library ICT employment.* [online] Available at: https://www.oecd-ilibrary.org/science-and-technology/ict-employment/indicator/english_0938c4a0-en [Accessed 26 Sep. 2018].

- OECD-ilibrary.org. (2018). *OECD library | ICT investment.* [online] Available at: https://www.oecd-ilibrary.org/science-and-technology/ict-investment/indicator/english_b23ec1da-en [Accessed 26 Sep. 2018].

- OECD. (2018). *Information and communication technology (ICT) - ICT goods exports - OECD Data.* [online] Available at: https://data.oecd.org/ict/ict-goods-exports.htm [Accessed 26 Sep. 2018].

- OECD. (2018). *Information and communication technology (ICT) - Access to computers from home - OECD Data.* [online] Available at: https://data.oecd.org/ict/access-to-computers-from-home.htm [Accessed 21 Sep. 2018].

- OECD. (2018). *Information and communication technology (ICT) - Internet access - OECD Data.* [online] Available at: https://data.oecd.org/ict/internet-access.htm [Accessed 26 Sep. 2018].

- Ons.gov.uk. (2018). *Profitability of UK companies - Office for National Statistics.* [online] Available at https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/bulletins/profitabilityofukcompanies/januarytomarch2018 [Accessed 16 Jan. 2019].

- Olumyuiwa, A., Sohaib, S. and Ling, Z. (2018). *Saudi's Growth and Financial Spillovers to Other GCC Countries: An Empirical Analysis*. [online] IMF. Available at: https://www.imf.org/en/Publications/WP/Issues/2018/12/11/Saudis-Growth-and-Financial-Spillovers-to-Other-GCC-Countries-An-Empirical-Analysis-46440 [Accessed 21 Mar. 2018].

- Okuda, A., Lee, K. and Delmotte, R. (2009). *Measuring ICT for Development and Building of the Information Society in Asia and the Pacific*. [Online] Available at: http://www.unescap.org/idd/working%20papers/IDD_TP_09_08_of_WP_7_2_913.pdf [Accessed 12 Jan. 2014].

- Online Dictionary of Library & Information. (2003) [Online] Available at: http://www.abc-clio.com/ODLIS/odlis_about.aspx [Accessed 12 June. 2013].

- Oxford Dictionary [Online] Available at: http://www.oxforddictionaries.com [Accessed 22 April. 2013].

- Oxford University. (2010). *Facebook and Twitter: the real winners in elections*? [Online]Available at:http://www.ox.ac.uk/media/news_releases_for_journalists/100712.html [Accessed 12 Sep .2013].

- Parry, E. and Tyson, S. (2011). Desired goals and actual outcomes of e-HRM'. *Human Resource Management Journal*, 21(3), pp.335-354.

- Pickard, A. (2013). *Research Methods in Information*. 2nd ed. London: facet.

- Proctor, T. (2000). *Essentials of Marketing Research.* 2nd ed. London: Prentice Hall.

- Preece, J. (2001). *Challenging the discourses of inclusion and exclusion with off limits curricula*. Surrey: University of Surrey.

- Ramaiah, C. (2013). *Electronic Resources Management in Libraries*. New Delhi: Allied Publishers.

- Remenyi, D. (2005). *European conference of E-Learning.* 4[th]ed. Amsterdam: Netherlands.

- Reitz, J. (2004). *Dictionary for library and information science.* Westport: Libraries Unlimited.

- Robbio, A. and Nair, R .(2017).*Eugene Garfield 1925-2017: Informatician Nonpareil Informatics Studies.* India: Centre for Informatics Research and Development/ Centre for South Indian Studies.

- Ruël, H., Bondarouk, T. and Looise, J. (2004). *E-HRM: Innovation or Irritation? An Exploration of Web-based Human Resource Management in Large Company.* Utrecht the Netherlands: Lemma Publishers.

- Ruta, D. (2005). The application of change management theory to HR portal implementation in subsidiaries of multinational corporations*. Human Resource Management,* 44(1). PP. 35−53.

- Ryman, A. (2006)*. Social Research Methods.* Oxford: Oxford University Press.

- Salam, S. (2010*). Information studies.* Jeddah: King Abdelaziz University.

- Salma, H. (2016)*. Stages of transition to electronic management.* Beirut: Dar almanhal.

- Salvaggio, J. (2013). *The Information Society*. Hoboken: Taylor and Francis.

- Sarat, A. (2019). *Cultural expertise and socio-legal studies. Studies in Law, Politics, and Society.* Bingley: Emerald Publishing Limited,

- Saudi Edi. *Saudi project for exchange information electronically.* [Online] Available at:

  http://www.saudiedi.com/sanam/pfk/PfkMainServlet?pContents=/sau/sauWalkin Url.jsp&pAction=FIRST&pPortalId=SAU&pHtmlfile=null&pImage=null [Accessed 24 Feb.2017].

- Saudi Ministry of communication and Information technology. (2017). *Brief History*. [Online. Available at: https://www.mcit.gov.sa/en/brief-history [Accessed 15 Mar. 2017].

- Saudi Ministry of communication and Information technology. (2017)*. Digital Education is a pioneering Saudi experience within the vision of the Kingdom 2030.*

- Saudi Ministry of communication and Information technology. (2017). Vision. [Online] Available at: https://www.mcit.gov.sa/en/page/98892 [Accessed 30 DEC. 2018].

- Saudi Ministry of Foreign Affairs. (2015). *Proceedings of World Summit on the Information Society*. Geneva.

- Saudi Press Agency. (2016). *Media center annual report.* [Online] Available at: http://www.citc.gov.sa/ar/mediacenter/annualreport/Documents/PR_REP_012A.pdf [Accessed 13 May. 2017].

- Saudi vision (2030). (2017). *Saudi plan regarded to information society.* [Online] Available at: http://vision2030.gov.sa/en/node [Accessed 27 Sep .2016].

- Saunders, M. (2011). *Research Method for Business Students.* 5th ed, New York: Pearson.

- Schement, J. (1985). *The origins of the information society in the United States.*: Competing Vision'*,* in Salvaggio, J. (ed.) (1989). *The information society.* New Jersey: Lawrence Erlbaum Associates inc, chp.3.

- Sekran, U. and Bougie, R. (2013). *Research Methods for Business: A Skill Building Approach.*5th ed. New Delhi: Wiley India Pvt. Limited.

- Servaes, J. (2003). *The European information society.* Portland: Intellect Books.

- Servaes, J. (2011). *The European information society.* Bristol: Intellect.

- Sieber, J. (2012). *The Ethics of Social Research: Surveys and Experiments.* New York: Springer.

- Simsim, T. (2017). Internet usage and user preferences in Saudi Arabia. Journal of King Saud University-*Engineering Sciences*, 23 (2), PP.101-107.

- Smythe, D. (1985). *An historical perspective on equity,* National policy on public and private sector in the U.S.A. Paper presented to the Thirteenth Annual Telecommunication Policy Research Conference, Airlie House, VA.

- Statista. (2018). *Cloud computing in the United Kingdom (UK).* [online] Available at: https://www.statista.com/topics/3164/cloud-computing-in-the-united-kingdom-uk/ [Accessed 20 Dec. 2018].

- Statista. (2019). *Mobile OS market share 2018 | Statista.* [online] Available at: https://www.statista.com/statistics/266136/global-market-share-held-by-smartphone-operating-systems/ [Accessed 28 Dec. 2018].

- Statista. (2019). *Countries with most Twitter users 2019 | Statistic.* [online] Available at: https://www.statista.com/statistics/242606/number-of-active-twitter-users-in-selected-countries/ [Accessed 22 Mar. 2019].

- Straub, D., Loch, K. and Hill, C.(2002). Transfer of information technology to the Arab world: A test of cultural influence modeling. *Advanced topics in glob information management*, 2 (4) pp.141-173.

- Strohmeier, S. (2007). Research in e-HRM: Review and Implications. *Human Resource Management Review*, 5 (17), pp. 19-37.

- Sun, W. and Zhang, M. (2015). *The New Culture.* Berlin: Springer.

- Sultan, M. (2017*). Between the obstacles and the future e - education in the Arab world*. Cairo: Dar Alshroq.

- Taylor-Powell, E. and Renner, M. (2003). *Collecting Evaluation Data: End-of-session Questionnaires, Madison*. 3rd ed Wisconsin: University of Wisconsin-Extension.

- Taipale, S. (2012). Mobilities in Finland's Information Society Strategies from 1995 to 2010. *Mobilities*, 8(2), pp.293-311.

- The official portal of the UAE Government. (2018). [online] Available at: https://www.government.ae/en/information-and-services/g2g-services/measuring-the-kpis [Accessed 22 Jan. 2019].

- Toluca, E., Sevrani, K. and Gorica, K. (2015). *Information Society Development through ICT Market Strategies.* Albania: Springer pp. XVII.

- Tucker, J. and Gentry, G. (2009). *Developing an E-Learning Strategy in Higher Education*. In I. Gibson, R. Weber, K. McFerrin, R. Carlsen & D. Willis (Eds.), *Proceedings of SITE 2009--Society for Information Technology & Teacher Education International Conference* (pp. 2702-2707). Charleston, SC, USA: Association for the Advancement of Computing in Education (AACE).

- Un-ESCWA. (2008). *Economic and Social Commission for Western Asia.* [Online]Available at: http://isper.escwa.un.org/AboutUs/tabid/58/language/en-US/Default.aspx [Accessed 24 Feb. 2018].

- Unctad.org. (2008). *The Global Information Society: A Statistical View*. [online] Available at: https://unctad.org/en/Docs/LCW190_en.pdf [Accessed 23 Mar. 2014].

- Unstats.un.org. (2010). *Core ICT Indicators 2010*. [online] Available at: https://unstats.un.org/unsd/statcom/statcom_2010/Seminars/ICT/Core_ICT_Indicators_2010.pdf [Accessed 24 Mar. 2014].

- UIS. (2009). [Online]Available at:

http://www.uis.unesco.org/library/documents/ict_guide_en_v19_reprintwc.pdf [Accessed15 Jan.2014].

- UIS. (2015). *Background Paper for ICT In Education.* [online] Available at: https://www.academia.edu/24129202/Developing_new_indicators_to_describe_di gital_technology_infrastructure_in_primary_and_secondary_education [Accessed 27 Mar. 2018].

- Webster, F. (2006). *Theories of the Information Society.* 3rd ed, New York: Routledge.

- Webster, F. (2014). *Theories of the Information Society.*4th ed, New York: Routledge.

- Webster, F. (2004). *The Information Society Reader.* New York: Routledge.

- Webster, F. (2006). *The Information Society Revisited.* London: Sage.

- World Summit, (2005*). World Summit on the Information Society.* [Online] Available at: http://www.itu.int/wsis/docs/geneva/official/poa.html [Accessed14 June. 2013].

- WSIS. (2016). *Internet Society.* [Online] Available at: http://www.internetsociety.org/wsis [Accessed 12 Dec.2017].

- Voerman, M. and Veldhoven. M. (2007). Attitude towards e-HRM: An Empirical Study at Philips*. Personnel Review*, 36, (6), pp. 887-902.

- Xanthidis, D. and Nicholas, D. (2004). Evaluating internet usage ecommerce growth in Greece. In *Alsip Proceedings,* 56 (6), pp. 356-366.

- Yin, R. (2009). *Case Study Research, Design and Methods.* 7th ed, London: Sage.

- Yunus, M. (2017*). The shift towards electronic management in.* Cairo: Dar alfth.

- Zambari, S. and Khalizani, K. (2017). The adoption of M-government services from the user's perspectives. *Empirical evidence from the United Arab Emirates,* 37, pp.367-379.

- Ziemba, E. and Zelazny, R. (2013). A practical perspective on the developing information society – case studies. *Online Journal of Applied Knowledge Management,* 1, (2), pp. 25-43 [Online]Available at: http://www.iiakm.org/ojakm/articles/2013/volume1_2/OJAKM_Volume1_2pp25-43.pdf [Accessed 12 May. 2014].

- Zureikat, K. (2017). The Extent of Applying E-Human Resources in Jordan From the Perspective of Human Resource Managers Within Commercial Banks in Jordan. *International Business and Management*, 14 (2), pp. 54-64.

List of websites

- Anon, (2019). [online] Available at: http://www.is.cityu.edu.hk/staff/isrobert/phd/ch3.pdf [Accessed 24 Feb. 2019].

- Anon, (2019). [online] Available at: http://css.escwa.org.lb/ictd/1712/Day1-PPT1.pdf [Accessed 24 Feb. 2019].

- Anon, (2019). [online] Available at: http://www.unctad.info/upload/WSIS5/Contributions/UNGIS/ESCWA.pdf [Accessed 24 Feb. 2019].

- ICT Business Magazine – (2019) *ICT Business Magazine.* [online] Available at: http://www.ictbusiness.org/index.php?option=com_content&view=article&id=1160:---q----q--20132014&catid=15:2012-09-07-17-03-40&Itemid=3 [Accessed 24 Feb. 2019].

- UEA Official petrol. (2018). *ICT indicators.* [online] Available at: https://government.ae/en/information-and-services/g2g-services/measuring-the-kpis [Accessed 29 Jan. 2019].

- Unctad.org. (2019). [online] Available at: http://unctad.org/en/docs/sdteecb20072rev1_en.pdf [Accessed 24 Feb. 2019].

- Unesdoc.unesco.org. (2019). [online] Available at: http://unesdoc.unesco.org/images/0015/001587/158723e.pdf [Accessed 24 Feb. 2019].

- Unesdoc.unesco.org. (2019). [online] Available at: http://unesdoc.unesco.org/images/0018/001865/186547e.pdf [Accessed 24 Feb. 2019].

- Uis.unesco.org. (2019). *UNESCO UIS.* [online] Available at: http://www.uis.unesco.org/Library/Documents/ICTguide11_Tec2_AR.pdf [Accessed 24 Feb. 2019].

Appendixes

Appendix 1

Pilot Study Questionnaire

Q1-Do you use the internet?

☐Yes ☐ No

Q2-For what reasons you use the Internet?

Work ☐

Pleasure ☐

Other ☐

Q3-Average usage time?

Q4- Do required publication annually?

☐Yes ☐ No

Q5-Annual number of e- publication?

Q6-Skills of using the Internet?

Q7-Using of e- communication?

☐Yes ☐ No

Q8- Using of e- submission?

☐Yes ☐ No

Appendix 2

Pilot study Interviews Questions

Impact

Q1-What factors limiting using the Internet as an academic source?

Q2- What steps required to raise awareness of information society?

Q3- Why is it important for Saudi to become an Information society?

Outcome

Q1- What effects on rates of unemployment by becoming an Information society?

Q2- Effects on productivity by becoming an Information society?

Q3- International competitiveness with becoming an Information society?

Appendix 3

The online questionnaire for medical &academic staff

E-communication

Q1-Does the institution provide an email account?

☐Yes ☐ No

Q2-Is institution email accounts provided considered as a formal way of communication between departments and staff?

☐Yes ☐ No

Q3-Does the institution provide different ways of electronic communication to employees?

☐Yes ☐ No

If yes, what are they

_____

E-services

Q1-Does the institution provide electronic services (e.g. vacation requests, information regarding the institution, filling of forms and other forms of services electronically)?

☐Yes   ☐ No

Q2-Does the institutions provide training on electronic technology to employees?

☐Yes   ☐ No

Q3-Do you use the institution E- services?

☐Yes   ☐ No

Q4-What type of E-Services do you use?

☐ Filling of form

☐ Request holiday

☐ Update personal data

☐ Sickness leave forms

☐ Resignation/retirement forms

☐ Others _____

Q5-What type of obstacles that limit you to use the in-situation E- services?

☐ Lack of experience

☐ It takes long time to get approval/answer

☐ Don't trust the electronic systems

☐ Others _____

E-Learning

Q1-Are the institutions following a clear strategy to provide e-education services?

☐Yes   ☐ No

Q2-Are the institutions exploiting the advancement in technology to improve e-learning?

☐Yes   ☐ No

Q3-Is e-learning technology used in the most efficient way?

☐Yes   ☐ No

Q4-Do you use e-learning in your field?

☐Yes   ☐ No

Q5-Are e-education materials available to employees on the institutions' website?

☐Yes   ☐ No

Scientific Research

Q1-Are you required to publish annually?

☐Yes   ☐ No

Q2-Do you face obstacles while carrying your scientific research electronically?

☐Yes   ☐ No

Q3-Is online submission of scientific research required?

☐Yes   ☐ No

Q4-Does the institution assist you in publishing your scientific research online?

☐Yes   ☐ No

E-sources

Q1-Do you use the internet as an academic source?

☐Yes   ☐ No

Q2-Does the institution provide database for academic sources?

☐Yes   ☐ No

Q3-Are academic database user-friendly?

☐Yes   ☐ No

Q4-Is the institution collaborating with others for an integrated academic database?

☐Yes   ☐ No

Appendix 4

The online questionnaire for Managers

E-communication

Q1-Does the institution provide an email account?

☐Yes ☐ No

Q2-Is institution email accounts provided considered as a formal way of communication between departments and staff?

☐Yes ☐ No

Q3-Does the institution provide different ways of electronic communication to employees?

☐Yes ☐ No

If yes, what are they

_____

E-services

Q1-Does the institution provide electronic services (e.g. vacation requests, information regarding the institution, filling of forms and other forms of services electronically)?

☐Yes   ☐ No

Q2-Does the institutions provide training on electronic technology to employees?

☐Yes   ☐ No

Q3-Do you use the institution E- services?

☐Yes   ☐ No

Q4-What type of E-Services do you use?

☐ Filling of form

☐ Request holiday

☐ Update personal data

☐ Sickness leave forms

☐ Resignation/retirement forms

☐ Others _____

Q5-What type of obstacles that limit you to use the institution E- services?

☐ Lack of experience

☐ It takes long time to get approval/answer

☐ Don't trust the electronic systems

☐ Others _____

E-Human Resource Management

Q1-Do you have any problems understanding the concept of electronic management?

☐Yes   ☐ No

Q2-Will E-HRM help give the institutions competitive advantage?

☐Yes   ☐ No

Q3- Will E-HRM reduce the number of users visiting the department?

☐Yes   ☐ No

Q4-Will E-HRM reduce human errors?

☐Yes   ☐ No

Q5-Will E-HRM ease access to employees' files?

☐Yes   ☐ No

Q6-Will E-HRM help in the decision-making process?

☐Yes   ☐ No

Q7-Does E-HRM improve the efficiency of managerial operations in the institution?

☐Yes   ☐ No

Q8-Do the different managerial departments take part in the setting up of strategic plans in regard to transforming into an e-management?

☐Yes   ☐ No

Q9-Are any official decisions made to transform the institution into e-management?

☐Yes ☐ No

Q10-Is the institution arranging programs to raise awareness for e-management?

☐Yes ☐ No

Q11-Does the institution officially certify e-signatures?

☐Yes ☐ No

Q12-Does the institution continuously provide qualified staff to facilitate the transition into an e-management?

☐Yes ☐ No

Q13-Are electronic tests uses in recruitment processes?

☐Yes ☐ No

Q14- Does the E-HRM provide the following services?

☐ **List job openings**

☐ **Update job specification**

☐ **Online Job Applications**

☐ **Resignation/retirement forms**

☐ **Sickness leave forms**

☐ **Others** _____

Appendix 5

INFORMATION SHEET

Research project*: monitor the development of Saudi society as an information society*

Researcher (principal contact)

Research supervisor

Name   **:** Ohoud Al Abdali

Prof   **:** David Bawden

University   **:** City University London

School   **:** Computer Science

School   **:** Computer Science

Dept   **:** Information Science

Course   **:** PhD in information science

E-mail   ███████████████████

E-mail   █████████████████████

Saudi Mobil number: ████████████

Introduction

We would like to invite you to take part in a research study. Before you decide whether you would like to participate, it is important that you understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

Purpose of the study

This study's aim is to measure the development of Saudi Arabia as an information society by using ICT indicators in the educational and health sector (E-services, E-HRM, Scientific research, E-communication, E-learning). The study will be completed in approximately 2 years as part of a PhD project in the department of Library and Information science.

Why have you been chosen?

The study will be targeting mainly the educational and health sectors, specifically head of departments, academics, medical staff and employees in Saudi Arabia in both sectors to ensure the efficiency of the results, around 1500 individuals will asked to complete an online questionnaire, whereas around 30-40 will be asked to participate in face-to-face interviews (mainly head of departments will be interviewed)

Do I have to participate?

Participation in the project is voluntary, and you can choose not to participate in part or all of the project. You can withdraw at any time and without having to give a reason. If you decide to take part, you will be asked to sign a consent form. You will still have the right to withdraw at any time without being obliged to give the reason.

What will happen if I take part?

You will only be involved in the duration of completing the interview or questionnaire; the study will last till the mid-2016. You will only need to meet the researcher one for the interview or answer the questionnaires through email. Interviews with the researcher will

last up to 40 minutes. The questionnaire should take no more than 20 minutes to complete.

What's expected from you?

You are only required to answer all the questions in the emailed questionnaires honestly and without pressure that can change your answer and alter the research result. If you are interviewed, you are required to briefly give you point of view on the questions asked by the researcher.

What are the possible disadvantages and risks of taking part?

There is no risk upon cooperating with the researcher. The only very unlikely risk is the involuntary leakage of participants data to unauthorized personnel.

What are the possible benefits of taking part?

Your participation will help the researcher to develop accurate and reliable finding. The result of the study may be used by Saudi Arabian policy makers to apply new policies that may develop Saudi Arabia as an information society and improve the overall standard of living of the country may use it.

What will happen when the research study stops?

All data from participants will be destroyed as soon as the study ends, Anonymized and summarized results may be forwarded to Saudi Arabian policy makers for future use.

Will my taking part in the study be kept confidential?

Participant's information will be completely confidential and can only be accessed by the researcher and the research supervisor, all the data will be destroyed after the researcher no longer needs them.

What will happen to the results of the research study?

The final results will be used for academic publication, and potentially supplied to policy makers in Saudi Arabia.

What will happen if I don't want to carry on with the study?

Participation is totally voluntary, and participants can withdraw from the study at any time without the need to give any reason, and without facing any consequences.

What if there is a problem?

In case of a problem at any kind, the researcher will provide the participants with full contact details, including a local Saudi mobile number with local rate, and is available for any enquiries or questions regarding the research or any problem faced in the process.

Who has reviewed this study?

The University Research Ethic committee, School of Informatics City University London, has approved the research.

If you would like to complain about any aspect of the study, City University London has established a complaints procedure via the Secretary to the University's Senate Research Ethics Committee. To complain about the study, you need to phone ███████ ████ You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is monitor the development of Saudi society as an information society.

You could also write to the Secretary at:

███████████

████████████████████████████

████████████████

████████████████

██████████████

██████

█████████

████████████████████

Further information and contact details Researcher (principal contact)

Name: Ohoud Alabdali

University: City University London

Dept: Information Science

School: Computer Science

Course: PhD in information science

E-mail: ███████████████████

Saudi Mobil number: ████████████████

Research supervisor

Name: Prof. David Bawden

University: City University London University London

School: Computer Science

Dept: Information Science

E-mail: ██████████████████

Thank you for your time reading this information sheet

Appendix 6

CONSENT SHEET

Research project: monitor the development of Saudi society as an information society

Please initial box

1.	I agree to take part in the above City University London research project. I have had the project explained to me, and I have read the participant information sheet, which I may keep for my records. I understand this will involve [researcher to add/delete as appropriate prior to use]: • be interviewed by the researcher • allow the interview to be videotaped/audiotaped • provide samples of blood/urine/muscle tissue/saliva/faces __ times at __ hour/day/week intervals • complete questionnaires asking me about …. • make myself available for a further interview should that be required • take a trial medication __ times a day for __ weeks • use a computer to …. • allow the researchers to have access to my medical/academic records
2.	This information will be held and processed for the following purpose(s): [*list purposes – researcher to add/delete as appropriate prior to use*] I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. No identifiable personal data will be published. The identifiable data will not be shared with any other organization. OR The identifiable data will be shared with (list organizations). This organization has made a written agreement with the University to abide by the Data Protection Principles. OR I understand that …………………………… (Outline steps to be taken) will be done to protect my identity from being made public.

	AND/OR
	I understand that I will be given a transcript of data concerning me for my approval before it is included in the write-up of the research.
	OR
	I understand that I have given approval for my name and/or the name of my village/community, and/or the name of my workplace to be used in the final report of the project, and future publications.
	OR
	I understand that confidentiality cannot be guaranteed for information which I might disclose in the focus group(s)/group interviews(s).
	OR
	I consent to the videotapes being shown to other researchers and interested professionals.
	OR
	I consent to the use of sections of the videotapes in publications.
3.	I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalized or disadvantaged in any way.
4.	I agree to City University London recording and processing this information about me. I understand that this information will be used only for the purpose(s) set out in this statement and my consent is conditional on the University complying with its duties and obligations under the Data Protection Act 1998.
5.	I agree to take part in the above study.

_____   _____   _____

Name of Participant   Signature   Date

When completed, 1 copy for participant; 1 copy for researcher file.

This sheet will be translated by the researcher in Arabic language to make sure all participants fully understand the form

Source: City university research guidelines (2014).

Ethics approval form

Ethics Proportionate Review Application: Staff and Research Students

Computer Science Research Ethics Committee (CSREC)

Staff and research students in the Department of Computer Science undertaking research that involves human participation must apply for ethical review and approval before the research can commence. If the research is low-risk, an application can be submitted for a proportionate review using this form. Applicants are advised to read the information in the SMCSE Framework for Delegated Authority for Research Ethics prior to submitting an application.

There are two parts:

Part A: Ethics Checklist.

The checklist determines whether the research is low-risk. If it is, Part B of the form should also be completed. If not, the checklist provides guidance as to where approval should be sought, but the checklist itself does not need to be submitted.

Part B: Ethics Proportionate Review Form. This part is the application for ethical approval of low-risk research and should only be completed if the answer to all questions (1 – 18) is NO.

Completed forms should be returned to the Chair of CSREC by email ███████████

Part A: Ethics Checklist

If your answer to any of the following questions (1 – 3) is YES, you must apply to an appropriate external ethics committee for approval:	*Delete as appropriate*
1. Does your research require approval from the National Research Ethics Service (NRES)? (E.g. because you are recruiting current NHS patients or staff? If you are unsure, please check at http://www.hra.nhs.uk/research-community/before-you-apply/determine-which-review-body-approvals-are-required/)	**No**
2. Will you recruit any participants who fall under the auspices of the Mental Capacity Act? (Such research needs to be approved by an external ethics committee such as NRES or the Social Care Research Ethics Committee http://www.scie.org.uk/research/ethics-committee/)	**No**
3. Will you recruit any participants who are currently under the auspices of the Criminal Justice System, for example, but not limited to, people on remand, prisoners and those on probation? (Such research needs to be authorized by the ethics approval system of the National Offender Management Service.)	**No**

If your answer to any of the following questions (4 – 11) is YES, you must apply to the Senate Research Ethics Committee for approval (unless you are applying to an external ethics committee):	*Delete as appropriate*
4. Does your research involve participants who are unable to give informed consent, for example, but not limited to, people who may have a degree of learning disability or mental health problem, that means they are unable to make an informed decision on their own behalf?	**No**
5. Is there a risk that your research might lead to disclosures from participants concerning their involvement in illegal activities?	**No**
6. Is there a risk that obscene and or illegal material may need to be accessed for your research study (including online content and other material)?	**No**

7.	Does your research involve participants disclosing information about sensitive subjects?	**No**
8.	Does your research involve the researcher travelling to another country outside of the UK, where the Foreign & Commonwealth Office has issued a travel warning? (http://www.fco.gov.uk/en/)	**No**
9.	Does your research involve invasive or intrusive procedures? For example, these may include, but are not limited to, electrical stimulation, heat, cold or bruising.	**No**
10.	Does your research involve animals?	**No**
11.	Does your research involve the administration of drugs, placebos or other substances to study participants?	**No**

If your answer to any of the following questions (12 – 18) is YES, you must submit a full application to the Computer Science Research Ethics Committee (CSREC) for approval (unless you are applying to an external ethics committee or the Senate Research Ethics Committee). Your application may be referred to the Senate Research Ethics Committee.	*Delete as appropriate*	
12.	Does your research involve participants who are under the age of 18?	**No**
13.	Does your research involve adults who are vulnerable because of their social, psychological or medical circumstances (vulnerable adults)? This includes adults with cognitive and / or learning disabilities, adults with physical disabilities and older people.	**No**
14.	Does your research involve participants who are recruited because they are staff or students of City University London? For example, students studying on a particular course or module. (If yes, approval is also required from the Head of Department or Programme Director.)	**No**
15.	Does your research involve intentional deception of participants?	**No**
16.	Does your research involve participants taking part without their informed consent?	**No**
17.	Does your research pose a risk to participants greater than that in normal working life?	**No**

18.	Does your research pose a risk to you, the researcher(s), greater than that in normal working life?	**No**

> **You must make a proportionate review application to the CSREC if your research involves human participation and you are not submitting any other ethics application (i.e. your answer to all questions 1 – 18 is "NO").**

Part B: Ethics Proportionate Review Form

If you answered NO to all questions 1 – 18, you may use this part of the form to submit an application for a proportionate ethics review of your research. The form must be accompanied by all relevant information sheets, consent forms and interview/questionnaire schedules.

Note that all research participants should be fully informed about: the purpose of the research; the procedures affecting them or affecting any information collected about them, including information about what they will be asked to do, what data will be collected, how the data will be used, to whom it will be disclosed, and how long it will be kept; the fact that they can withdraw at any time without penalty.

Background Information	
Name	Ohoud Alabdali Email ███████████████
Supervisor (if student)	Prof, David Bawden Email ████████████
Your Research Project	
Title	Monitor the development of Saudi society as an information society.
Start date	1-Oct-2012
End date	30-Sep-2016
Information society nowadays consider as the backbone of most countries, where the information is considered as resources for future economic and social development. In these societies the information and communication technology plays the most important role, However, the project aim is measuring Saudi Arabia as an information society by using ICTs (Information and communication technology) indicators is a tool used to measure the level of development in these sectors. However, this study will use the ICT indicators in	

Saudi Arabian society, mainly in the educational and health sectors. Also, the study will compare Saudi result with results from both the UAE and UK to acquire a benchmark.

The design of the research will consist of the following; Online questionnaires and face-to-face interviews, and these two methods are based on Webster theories in information society by measuring information society in 2 areas that are employment and technology by using Grand's (2002) indicators that are specialized in measuring information societies. The researcher will then analyses the results and compare them to results from other countries such as the UK and the UAE. The questionnaire number of samples will be around 1500 individual including academics, medical staff and employees from different departments at the institution, and will cover those areas; E-HR management, E-services, E-communication, E-resources, scientific research and E-learning. The data will be collected from hospitals and universities from corresponding countries

Attachments (these must be provided if applicable):	*Delete as appropriate*
Participant information sheet(s)	**Yes**
Consent form(s)	**Yes**
Questionnaire(s)	**Yes**
Topic guide(s) for interviews and focus groups	**Yes**
Permission from external organizations (e.g. for recruitment of participants)	**Not applicable**

Templates

The University provides templates which should be used as the basis for your participant information sheets and consent forms. These are available from the links below but **must** be adapted according to the needs of your project before they are submitted for consideration.

Adult information sheet:

http://www.city.ac.uk/__data/assets/word_doc/0018/153441/TEMPLATE-FOR-PARTICIAPNT-INFORMATION-SHEET.doc

Adult consent form:

*h*ttp://www.city.ac.uk/__data/assets/word_doc/0004/153418/TEMPLATE-FOR-CONSENT-FORM.doc