FACTORS INFLUENCING CITIZENS' ACCEPTANCE OF M-GOVERNMENT SERVICES (G2C) IN SAUDI ARABIA

By

Sultan Refa Alotaibi

Supervisor: Dr. Dmitri Roussinov

Thesis submitted for the degree of Doctor of Philosophy

Department of Computer and Information Sciences

University of Strathclyde

August 2017

List of Publications:

- <u>Posters</u>

1) Sultan Alotaibi and Dmitri Roussinov. *Applying Mixed Research Methods to Mobile Government Studies in Saudi Arabia*. Presented in SSC8 at Imperial College in London as a poster in February 2015.

2) Sultan Alotaibi and Dmitri Roussinov. *Using GPower software to determine the sample size from the pilot study*. Presented in SSC9 at Birmingham University as a poster in February 2016. **- <u>Papers</u>**

3) Alotaibi, Sultan and Roussinov, Dmitri (2015) *A conceptual model for examining mobile government adoption in Saudi Arabia.* In: Proceedings of the European Conference on e-Government, ECEG. Academic Conferences Limited, pp. 369-375.

ISBN 9781910810194

4) Alotaibi, Sultan and Roussinov, Dmitri (2016) *Developing and validating an instrument for measuring mobile government adoption in Saudi Arabia.* In: Proceedings of the 18th International Conference on e-Government, ICEG, pp. 727733.

5) Alotaibi, Sultan and Roussinov, Dmitri (2017*) Using Focus Group Method to Identifying Citizen Requirements to Saudi Mobile Government Services.* In: Proceedings of the 19th International Conference on e-Government, ICEG, pp. 561-565. *6)* Alotaibi, Sultan and Roussinov, Dmitri *(2017) User Acceptance of the MGovernment Services in Saudi Arabia: Using SEM Approach.* Accepted in the European Conference on Digital Government, *ECDG.* **-Awards**

1) The paper entitled "*Developing and validating an instrument for measuring mobile government adoption in Saudi Arabia"* has been awarded as the best paper in the 18th International Conference on e-Government in London.

2) I have been awarded as a Saudi distinguished student from his highness prince Mohamed Bin Nawaf the ambassador of Saudi Arabia to the UK.

Abstract

Recently, many governments have started to change the ways of providing their services, so they permit their citizens to access services from anywhere, without the

necessity to visit the place of the service provider physically. Mobile government (M-government) is one of the techniques which fulfils that goal and has been adopted by many governments. M-government can be defined as an implementation of Electronic Government (E-Government), where mobile technology is used, with the aim of improving service delivery systems to citizens, businesses and to all government agencies. Although m-government services have emerged several years ago, the adoption rate of these form of services have been considered to be below that of the expectations in the Arabic gulf countries in general, and at Saudi Arabia in particular. Therefore, many governments around the world started to conduct research on e/mgovernment adoption. While plenty of research on e-government exists, there is a research gap on m-government adoption, particularly in the Arabic gulf countries.

The aim of this research is to explore the attitudes and perceptions of citizens towards the acceptance of mobile government (m-government) services in Arabic gulf countries, namely Saudi Arabia. This research study has also developed and validated a quantitative model. This developed model uses TAM (Technology Acceptance Model), expanded by additional variables including perceived service quality, perceived trustworthiness, perceived mobility, and user's satisfaction.

I have used mixed research methods including numeric questionnaire with an openended question added, focus groups, and interviews. The developed model has been validated by over 695 participants at King Saud University and Imam Muhammed Bin Saud University using the Structural Equation Modelling technique (SEM). The findings support the supposition that both the measurements and the structural models are a good fit to the data. This research also has shown that all theoretical and research constructs satisfy the criteria of reliability, convergent and discriminant validity. The hypothesis testing shows that ten relationships are significant, while the remaining two are not.

The participants in the focus group and the answers that they have provided to the open-ended questions identified several factors influencing the citizen's acceptance of m-government services within Saudi Arabia. These factors are trust in mobile network, trust in government, ease of use, usefulness, citizens' satisfaction, citizens' awareness, digital divide and service quality. The interviewees were also able to identify several challenges confronting the implementation of m-government such as change management, legal issues, technical issues, lack of support, collaboration issues and absence of guidance on the practical steps to implement m-government projects.

Keywords: E-government, M-government, Technology Acceptance Model (TAM), Structural equation modelling (SEM), technology adoption, developing countries, Arabic countries, Saudi Arabia.

Attestation

This thesis is the result of the author's original research. It has been composed by the author and has not been previously submitted for examination which has led to the award of a degree.

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Signature Sultan Alotaibi **Date** 23/08/2017

Acknowledgements

First, I would like to thank Allah, the most merciful, and gracious, who enabled me and gave me everything to complete this thesis.

I wish to convey my sincere admiration and gratitude to every person that has added to the conclusion of this dissertation. To begin with, I had a vast chance to research under the guidance of Dr. Dmitri Roussinov. I am extremely appreciative for leadership, counsel, and support. Without Dr. Dmitri Roussinov, this dissertation would by no means have been completed. His charm, professionalism, and reasonableness assisted me to conquer several challenges along the course.

Moreover, much gratitude to all my friends within the United Kingdom and abroad, particularly Dr. Muhammed Althobaiti who offered support and good cheer to me when I really needed it.

Last and not least, exceptional appreciation to my wife, my much-loved parents, my lovely son, brothers and sisters for being support system all through this whole course and for the several sacrifices in order that I could pursue my dream.

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1 CHAPTER ONE: INTRODUCTION

This research is the first study that utilises mixed research methods in Saudi Arabia about the adoption of m-government, because the previous studies were designed to identify the factors that influenced the adoption of m-government without being tested empirically. This study identifies the factors which are most important in this context and how these are related with each other in terms of acceptance of m-government at Saudi Arabia. This study contributes to the existing knowledge in terms of the process used in applying the methodology of focus groups to confirm an integrated model for this research. Finally, this study contributes to existing knowledge in terms of level of analysis. This study included two groups of participants (the Government and the Citizens). This integration gives an idea about the complexity faced by the Government if they are to succeed in implementing m-government. This means that any study of large scale system such as m-government project should take into account multiple levels of analysis and this has taken place in this research study as well.

1.1 The Structure of the Thesis

The purpose of this chapter is to present an overview the dissertation. The remaining subsections of this chapter mirror the remaining chapters, which provide the full details. The thesis is organised into eleven chapters. It was felt appropriate to divide the literature review into two chapters aiming to gain a complete picture of the phenomenon since it includes two domains: 1) Electronic and Mobile governments (Chapter Two) and 2) the related prior work (Chapter Four). Chapter Three presents the situation in the country of the study (Saudi Arabia). Chapter Five presents my research methodology. The developed model is presented in Chapter Six. The data analysis is divided into three chapters aiming to gain a multifaceted picture of the phenomenon: 1) descriptive data analysis, 2) statistical data analysis and 3) qualitative analysis. Chapter Ten discusses the results. Chapter Eleven presents the recommendations and conclusions.

1.2 E-Government and M-Government

Chapter Two starts with the discussion of the concept, the categories and stages of the e/m-government. Further, it discusses the main drivers for adopting the electronic/mobile delivery of services in the developed and developing world. Then, it details the potential advantages and disadvantages of e/m-government.

Information and Communication Technology (ICT) and the Internet are crucial parts of our lives nowadays, in different fields and at various levels. Public service delivery is one of the fields that have been strongly affected by the recent technology advances. The quality and type of services that are delivered to citizens have been influenced by ICT (Information and Communication Technology). The communication between individuals, on one side, and various organizations and services providers, on the other, has been hastened and expanded, leading to improved collaboration. With the involvement of ICT in public service delivery, there has been a shift from bureaucratic paradigm to e-government (electronic government): services are now often delivered in the form of electronic exchanges instead of paper-based documents used previously (Ho, 2002). Upon the formation of the e-government concept, "m-government" (mobile government) concept has also emerged, where wider sets of ICT tools are being considered in public service delivery, specifically emphasizing emphasis is being put on mobile platforms such as PDA-s and tablets. The presence of those two environments (e-government and m-government) and the nature of relationship between them has been a subject of several studies, including investigating if this relationship is competitive or complementary to each other (Lallana, 2004;Kushchu and Kuscu, 2003), with the majority of the studies supporting the latter, it gets explained by the fact that m-government is founded on the same principles as e-government and adds particular features that distinguish the former from the latter. Those features are (Lallana, 2004):

1) Continuity of communication between government service providers and citizens at all times, as mobile phones are always turned on which means an easy access to the network anytime and anywhere.

2) The citizen might easily benefit from government services via mobile phones, which became a very efficient communication means between people, either in developed or developing countries.

3) Using mobiles phones to access the web is overriding the use of personal computers, thus saving time and displacement to home or to the physical place of the service provider.

1.3 Saudi Context

The aim of this research is to explore the attitudes and perceptions of citizens towards the acceptance of m-government services in an Arabic gulf country, namely Saudi Arabia. Chapter Three focuses on presenting the Saudi Arabian context and discussing related issues, particularly the current state of its e/m-government initiatives. The

chapter covers matters, such as, the political system, population and people of Saudi Arabia. In addition it examines the current situation of information technology and egovernment transaction programmes. The main objective of Chapter Three is to understand the country's context since it is an essential element in determining the relevant factors for adoption in the Chapter Six.

The Saudi government has adopted the mobile services as many other countries have done also. This service has been applied in offering governmental services to the citizens and other stake holders through the use of electronic devices. Among the major services there are such widely used ones as weather forecasting, receiving students' examination results, and making off health-related appointments. Saudi citizens enjoy the same benefits of having access to mobile government as have been reported earlier in other countries since they are easily accessible at any place (Alsenaidy and Ahmed, 2012).

Saudi Arabia has been chosen for the study since it serves as a particular case of Arabic Gulf country and for convenience, also since the author of this dissertation is from and is sponsored by that country. The Saudi Arabian government has decided to adopt m-government services for the similar reasons as the developed countries have (Babullah *et al.* 2015). It was also since the Saudi government was experiencing high growth rate of internet users (Babullah *et al.* 2015). The number of internet users has been on the rise as compared to the number of mobile line users since 2005. According to a research that was conducted by United Nations Conference on Trade and Development UNCTADS in 2012, indicated that Saudi Arabia had the highest population in the world of citizens who were dependent on mobile phones. For every 1000 people in Saudi Arabia there are 1800 mobiles (Babullah *et al.* 2015; Alsenaidy and Ahmed, 2012). Although new technology exists, the citizens still depend on traditional methods of communication and transactions with the government (Abanumy and Mayhew, 2005; Alhussain *et al.* 2010; Al-Khalifa, 2011; Almutaiari, 2011& Alsenaidy and Ahmad, 2012).

Lack of doing research about adoption of the m-government services in Saudi Arabia government may explain the low rate of m-government services approval, this led to poor understanding of the factors that may be of importance (Babullah *et al.* 2015; Dwivedi and Irani, 2009). According to Babullah *et al.* (2015), "it has been argued that using m-government in Saudi Arabia is not common because Saudi citizens have not used it frequently". In addition, Dwivedi *et al.* (2013) found that lack of studies led to low rate of m-government services approval.

1.4 Prior Work

Chapter Four of the dissertation contains the third part of the literature review and establishes a basis for the main issues surrounding e/m-government and, in particular, citizen's adoption in order to gain an understanding of current e/m-government practice and its scope. It starts by reviewing and examining commonly established theoretical models in the literature of IT adoption. Additionally, a review of related empirical studies for each model is presented to extend the understanding of the relevant determinants of adoption.

Two main streams of research studying m-government adoption can be identified in the existing literature:1) supply-side and 2) demand-side (Sultana et al. 2016). The supply-side stream focuses on studying the challenges facing m-government implantation from point of view of the government, either locally or nationally (e.g. Lai and Chuah, 2010; Brosnan, 2005). Examples of these challenges are related to IT infrastructure, financial resources, skilled personnel and resistance to change. The demandside stream focuses on m-government adoption from point-of-view of the demand (e.g., Wang *et al.* 2012; Hung *et al.* 2013), which is the factors affecting citizens' adoption and use of m-government services (Sultana et al. 2016) such as trust, culture, perceived usefulness, perceived ease of use, experience and attitude. There are very few studies focused on the demand-side perspective (Wang *et al.* 2012; Hung *et al.* 2013). This study aims to fill that gap by studying the citizen's acceptance of mgovernment.

Despite the local and national government's investments and efforts to provide the public with e/m-services, there is a minimal service uptake reported across the globe (Wang, 2003; Wang, 2014; Liu et al. 2014; Fu et al. 2012; Abdelghaffar and Magdy, 2012; Reddick, 2014; Kumar et al. 2007; Osman, 2013; Choudrie and Dwivedi, 2005; Mamte et al. 2013; Wadie and Hasan, 2015; Carter and Belanger, 2004; Liang and Lu, 2013; Ahmad, 2015; Belanger and Carter, 2008). The citizens prefer traditional methods in accessing government services including in-person visits (Belanger and Carter, 2008; Abdelghaffar and Magdy, 2012; Ahmad, 2015). The implication of this is that there is a low rate of electronic or mobile government adoption (Liu et al. 2014; Wang, 2014). For example, the survey conducted by Ohme (2014) among 517 participants in Germany, revealed that only 35% of the participants were aware of mobile governance services. In Egypt, there is low level of adoption of mobile governance services, because Abdelghaffar and Magdy (2012) found that only 23% of their sample use governance

services. Also, the survey conducted by Liu et al. in (2014) in China, revealed that only 31% of the participants were aware mobile government service.

However, the adoption rates of these services by citizens all over the world has been lower than expected and it restricts governments from comprehending the full potential of the benefits of using these services (Wang *et al.* 2012; Hung *et al.* 2013; Carter and Belanger, 2008). According to the United Nations publications (2012) "the level of e-government adoption is generally low, even in the most advanced countries: the average usage rate is 32 per cent only in EU27 countries, and 40 per cent in OECD countries". Governments have been putting efforts to understand as to which factors influence citizens to accept and start using these services(Liu et al. 2014; Wang, 2014).

Chapter Four concludes that there is a need to conduct further studies on the acceptance of G2C mobile government services because of the low rate of citizen's acceptance of mobile government services and information. The main aim of this research is to help, in this case the Saudi government, to come up with the appropriate strategic action to meet the needs of its citizens after understanding the factors that influence citizen acceptance of mobile government services.

1.5 Methodology

Chapter Five details the research methodology proposed for identifying the key factors that affect citizen acceptance of m-government services. The chapter starts with a description of the two philosophical paradigms, namely, Positivism and Interpretivism. It presents comparisons of the quantitative and qualitative research strategies. The chapter also introduces the most popular research methods and data collection techniques in Information Systems for the study of technology adoption. It provides relevant justifications for the chosen research approach, strategy and methods. The research instrument (survey) has been developed based on the related previous works. The issues related to translation of the instrument, subjects and sampling techniques are also discussed. It is followed by describing the process of the pilot with data analysis and validation.

The aim of this research is to explore the attitudes and perceptions of citizens towards the acceptance of m-government services in Saudi Arabia. I have also developed and validated a model, which is designed to be useful for many countries considering delivery of m-government services. This model will assist decision makers involved in

m-government service projects to better understand the factors influencing the acceptance of m-government services.

This research uses TAM (Technology Acceptance Model), as well as external variables including perceived service quality, perceived trustworthiness, perceived mobility, and user's satisfaction, in order to test its applicability in the context of acceptance of mgovernment services.

The specific objectives of this study are to:

1) Examine the progress made in Saudi Arabia in providing m-government services to the public.
2) Identify factors that are likely to determine citizens' acceptance of mgovernment services, using TAM with additional external factors.
3) Examine the impacts of perceived service quality, perceived trustworthiness, perceived mobility and user's satisfaction of m-government services as revealed by students, academic staff and administrators.
4) Examine the impacts of demographic variables including, gender, age and education on the proposed hypothesis.

The main research question of my study was: What are the factors influencing citizens' acceptance of m-government services in Saudi Arabia?

From this main research question, several sub-research questions have been considered, specifically:

1) How can m-government be defined?
2) What is the status of e-government and m-government in Saudi Arabia?
3) Which factors influence citizens' intention to accept m-government services?
4) How do demographic variables impact on the proposed hypothesis?

In order to answer the research questions highlighted in this section, it is fundamental to select the relevant research methodology for the current research work (Leedy, 2005). After a careful view and investigation amongst the existing approaches, I decided on the combination of qualitative methods (focus groups, interview and openended questions) and a quantitative method (statistically analysing a survey). This combination of methods, known as triangulation, has been widely used by IT researchers (Myers,

1997). Triangulation offers a better understanding of the studied phenomenon due to using varying research methods to validate the collected data, as well as the derived outcomes (Bouma, 1996). Furthermore, qualitative and quantitative research methods are considered as complementary to each other (Zikmund, 2000; McDaniel and Gates 1993). The collection of data for the focus group and the interview were mainly based on group meeting and semi-structured interviews. Quantitative research methods have allowed testing relationships between the research model variables. They are intended to support or disprove the research hypothesis (Bélanger and Carter, 2005; Gefen et al. 2002; Lee et al., 2005; Warkentin et al. 2002; Moon and Kim, 2001).

1.6 The Developed Model

Chapter Six describes the key elements that affect citizens' acceptance of Mgovernance services in order to answer the main research question. The aim of this chapter is to decide upon a theoretical framework for the research. Therefore, based on the three chapters of the literature review, the study develops and presents the research model for citizens' acceptance of m-government.

In order to examine and investigate the factors which affect the adoption of a technology in a specific society, many theories and models have been developed by researchers. TAM (Technology Acceptance Model) is one of these models, which has been widely used as a fundamental framework in several research studies of technology adoption from the demand side (Wang *et al*. 2012; Hung *et al*. 2013). This extensive use of TAM is justified by its applicability to various research fields, as well as to its performance and ability in explaining and predicting factors affecting technology adoption and usage. In this study, TAM has been extended by considering perceived mobility, perceived service quality, users' satisfaction, and perceived trustworthiness.

1.7 Qualitative Data Analysis

The findings of the qualitative results of this research are presented within Chapter Seven. It summarizes the results of the interviews, focus group and the open ended question reflecting the views of the m-government officials and the participants in the focus groups and open ended questions concerning m-government acceptance within Saudi Arabia.

The participants in focus group and open ended questions indicated several factors influencing the citizen's acceptance of m-governments services within Saudi Arabia.

These factors are trust, ease of use, usefulness, citizens' satisfaction, citizens' awareness, digital divide and service quality. These findings are in line with the results of earlier m-government researches within different context (e.g. Liu et al. 2014; Hung et al. 2013; AL-Thunibat, 2011; Aloudat et al. 2014; Wang et al. 2012; Sharref et al. 2012; Susanto and Goodwin, 2010; Abdelghaffar and Magdy, 2012; Mamte et al. 2013)

Even though the supply-side implementation of m-government services is not the focus of this research, the interviewees reported several difficulties confronting mgovernment adoption in Saudi Arabia. In accordance with m-government officials within Saudi Arabia, the key challenges include change management, legal issues, technical issues, lack of support, collaboration issues and lack of practical step to implement m-government project.

1.8 Quantitative Data Analysis

Chapter Eight presents a descriptive analysis of the data that includes the demographic profile of the respondents and mobile usage patterns. It also tests the normality and possible outliers. The aim of this analysis is to determine the demographic profile of the participants such as gender, age, educational level and which college they are from. Also, it aims to infer their mobile usage time and motivations to use mobiles. This research uses 695 sample responses, each with 51 measurements are utilised as questions. The first 8 questions expressed by the sample respondents included their socio-demographic characteristics such as age, gender, and education level and occupation status. The researcher uses descriptive analysis to test 11 factors: perceived usefulness, perceived ease of use, perceived mobility, responsiveness, reliability, empathy, satisfaction, trust, attitude and their intention to use the mobile government service and actual use of mobile government services. The agreement levels of the respondents on these aspects are measured using the Likert's five point scale ranging from 'Strongly agree' (score =1) to 'Strongly disagree' (score =5). 63% of the sample are male and 37% are female. It is found that nearly 43.5 % (302) of sample are in the age group of 18-20 years. This is followed by 29.6 % (206) in the age group of 21-23 years. Nearly 20 % (139) of sample belongs to the 'College of Science', followed by College of Medicines (13.2%). Nearly 97 % (674) of the sampled

population uses the mobile phones daily and thus the information from such repeated user is more useful to identify the factors influencing the mobile government service.

The structural equation modelling technique is presented in Chapter Eight. The main goal of it is to test the hypothesized models and to put forward the results of the applied theories. It's higher level goal is to decipher the most important points related to the acceptance of m-government services by the general public. The AMOS 23 software has been used for verification of measurement and structural models. The measurement and structural models demonstrated a methodologically acceptable fit for all indices with regards to all constructs. The results also showed positive and significant relationships between the following factors and the acceptance of m-government: perceived ease of use and perceived usefulness (H3), perceived ease of use and attitude towards using m-government (H2), perceived usefulness and intention to use mgovernment (H4), attitude towards using m-government and intention to use mgovernment (H5), perceived trustworthiness and intention to use m-government (H6), perceived mobility and intention to use m-government (H7), responsiveness and citizens' satisfaction (H8b), reliability and citizens' satisfaction (H8a), citizens' satisfaction and actual use of m-government (H9) and intention to use m-government. On the other hand, there was no confirmed relationship between the perceived usefulness, attitude towards using m-government (H1), empathy and citizens' satisfaction (H8c).

1.9 Discussions

Chapter Ten aggregates the key factors that affect citizens' acceptance of mgovernment services based on all the mixed methods involved. The investigation of these factors provides a better understanding of the antecedents of m-government acceptance. It can be realized that there are several factors acquired from the focus group and the open ended questions such as citizens' awareness, digital divide, *trust, ease of use, usefulness, citizens, satisfaction and service quality*. However, the results from the quantitative analysis show that there are several factors from the survey such as e*ase of use, usefulness, service quality, citizens' satisfaction, intention to use, mobility, trust, attitude towards use*. Hence, the common factors between these methods include:

trust, ease of use, usefulness, citizens' satisfaction and service quality.

1.10 Conclusions and Recommendations

Chapter Elven provides several recommendations to Saudi government based on the findings of this research. It has also the limitations of this research. It has also some directions for future research.

1.11 Contribution to Knowledge

This study provides an integrated model to examine factors for acceptance of mgovernment services at Saudi Arabia. Also, this study identifies the factors which are most important in this context. The theoretical basis is Technology Acceptance Model (TAM) with additional variables including perceived service quality, perceived trustworthiness, perceived mobility, and user's satisfaction.

1.11.1 Contribution to Theory

The new developed model of actual use of m-government services integrates TAM with additional external variables including perceived service quality, perceived trustworthiness, perceived mobility, and user's satisfaction. These external variables have been taken from the related previous literature, as proven important factors in the acceptance of m-government services.

1.11.2 Contribution to Practice

Several socioeconomic groups will benefit from this study including the decision makers involved in the governance development projects, mobile service providers, and users (citizens, businesses). The decision makers will be able to adjust their policies through better understanding of the relationships between the variables involved, such as perceived ease of use and perceived usefulness (H3), perceived ease of use and attitude towards using m-government (H2), perceived usefulness and intention to use m-government (H4), attitude towards using m-government and intention to use mgovernment (H5), perceived trustworthiness and intention to use m-government (H6), perceived mobility and intention to use m-government (H7), responsiveness and citizens' satisfaction (H8b), reliability and citizens' satisfaction (H8a), citizens' satisfaction and actual use of m-government (H9) and intention to use m-government and actual use of m-government (H10).This will naturally lead to better fulfilment of the citizens' and the businesses' needs.

2 CHAPTER TWO: E-GOVERNMENT AND MGOVERNMENT

2.1 Introduction

This chapter contains a detailed explanation of the literature defining m-government and e-government services and describing the current state of affairs in the developed and developing countries. It presents the definitions for both, their classifications, as well as the relationship between the two. It also explains their observable benefits through

currently available examples, and presents a literature survey on existing mgovernment projects, in both developed and developing countries.

2.2 E-Government

2.2.1 The Notion of E-government

The term e-government is the abbreviated form of electronic government services. It has evolved with the use of communication technology which offers government services in electronic form via the use of internet enabled devices like computers and smartphones. It has been forecasted that the use of electronic devices for such services improves the efficiency of service delivery and ensures real-time access of customers to information concerning the services and news that their government may want them to know: according to Carter and Belanger (2004), using electronic versions of government services would lead to improved integrity and minimise the rate of corruption in the government departments. The use of electronic services would lead to improved relations between the government and its citizens due to the issuance of critical information and the faster dissipation of the services (Omar, 2010). E-government services also increase public participation in government activities by providing platform to the citizens for consulting and soliciting feedback from citizens in the policy making process (Pon, 2004).

However, the adoption rates of these services by citizens all over the world has been lower than expected and it restricts governments from comprehending the full potential of the benefits of using these services (Wang et al., 2012; Hung et al., 2013; Carter and Belanger, 2008). According to the United Nations publications (2012) “the level of

e-government adoption is generally low, even in the most advanced countries: the average usage rate is 32 per cent only in EU27 countries, and 40 per cent in OECD countries. Governments have been putting efforts to understand as to which factors influence citizens to accept and start using these services (Liu et al., 2014; Wang, 2014).

2.2.2 Defining E-Government

According to Halchin (2004), several definitions has been proposed for an egovernment. American Society for Public Administration (ASPA, 2002) defined egovernment as the integrated use of the internet and the web to deliver government services to its citizens. According to Heeks (2003), E-government is defined as the use of ICT to enhance the effectiveness of organisational activities, both in the private and the public sector. Jaeger (2003) defines it as an incorporation of internet usage in order to ensure effective delivery of commodities to the citizens by its government.

According to the World Bank (2007), e-government refers to "the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management". Riley (2007) believed that electronic government services would cause a transformation in the means of information exchange and the relationships between members of a state and their government officials.

2.2.3 Groupings of Electronic-government Services

According to Asgarkhani (2005), e-government services have been divided into 4 main categories, namely; government and employees (G&E), government and business (G&B), government and citizens (G&C) and government and government services (G&G). These categories are based on the parties involved in the services. All services are offered by governments and the recipients can be citizens, businesses, employees or government services (Backus, 2001).

2.2.3.1 Government to Government services.

This type of electronic services lead to use of ICT services in offering government services between the government agencies. Amongst the services rendered under this category, are government grants and training courses for government officials, employee directory, and other similar internal services of the government are most prominent (Pagano and Cook, 2004; Sagheb-Tehrani, 2007). According to Pagano and Cook (2004), the importance of this category comes from the empowerment of interaction within the government agencies. For example, citizens in many cases are forced to deal with two or more governmental institutions to complete a deal. Most transactions require several steps, such as filling out forms, providing personal information and information relevant to the commercial transactions, making payments, and even issuing a permit or license. Without proper integration between the different government institutions it is not possible to successfully implement these steps. Riley (2001) argues that the system of government is, in fact, a group of subsystems, and therefore, the category G2G would help increase cooperation between various governmental institutions under control of the central government. Additionally, it would amount to reduction of operational costs as well as time. Avoiding bureaucracy is one of the key objectives of e-government. According to Ndou (2004), decentralisation of government services through use of electronic government services can lead to effective departmental relations as databases and the crucial information are at the disposal of all the departments which they can access at their convenience. G2G services are aimed at creating faster flow of information and services. This is greatly achieved through use of online storage in order to assist in the management of databases between the various governmental institutions scattered throughout the country (Fang, 2002; Pagano and Cook, 2004), and is not just a secondary option in the acceptance and the prolonged use of e-government commodities.

2.2.3.2 Government-Business services.

This category of e-government services aim at creating electronic interaction between businesses and government agencies within a country. The government and business leaders communicate via the use of internet enabled devices and exchange vital information and services (DeBenedictis et al., 2002). This category is provided through the so-called electronic marketplace (or e-marketplace), where commercial activities are enabled and organised, such as, procurement bids, international trade, and many other commercial activities (Fang, 2002). However, Kolsaker and Lee-Kelley (2004) indicate

that through G2B, the government aims at cost-effectiveness time management through the promotion of business sector and making it smoother as compared to the situation before the advent of technology. This means that G2B improves the interaction between government and private sector institutions by getting rid of bureaucracy, which is shared with the public sector, and specifically in the environment of countries undergoing development (Ndou, 2004). However, G2B is equally important as the other forms of e-government. In this regard, Stokes (2005) indicates that through this category, government assesses the relations with the private sector and thus promotes growth of the economy. Some of these services may emerge from customs declarations, submission of data to statistical offices, registering a new business, declaring and notifying on corporate tax (Sagheb-Tehrani, 2007).

2.2.3.3 Government to its Citizens.

This form of electronic government service addresses the relationship between agencies of the government and the citizens. Under this category, governments seek to rebuild bridges of trust with citizens in the framework of the so-called citizen-centric services. According to Horan et al. (2006), this means focusing on citizens in the provision and design of services to the public. This confirms that the maintenance of citizen satisfaction with the public services remains the main objective of the government in encouraging and providing e-government services to its citizens (Ho, 2002).

Several researchers (Riley, 2001; Fang, 2002; Halachmi, 2004; Sagheb-Tehrani, 2007) indicated that the electronic services provide basic services such as health care and social welfare. They are also expected to provide more complex services such as granting licenses and paying taxes owed, as well as the notification and assessment for taxation. Through this category, governments are seeking to promote citizens' participation in government meetings and discussions, which ultimately lead to the establishment of effective and corruption-free governments. The increased citizen participation through the use of these services leads to consolidation of democracy (Ndou, 2004 and Halachmi, 2004).

2.2.3.4 Government to its employees.

This form of e-government services are aimed at enhancing the relationship between agencies of the government and the employed people in the government. However, this category has long been seen as part of G2G category. Fang (2002) argues that the

interaction between the government and its employees must be taken into account, where they are seen as internal stakeholders of the government, and also have expectations and needs to be met. He also argues that the G2E category should be seen as one of the preliminary initiatives, given the importance of participation of employees in managing government services to the public. This involvement leads to enhanced effectiveness and the process of governance and provision of services become more efficient. Similarly, Ndou (2004) stresses the importance of this category in meeting the needs and expectations of government employees. He also adds that the employees had become more independent, aware of their rights, highly skilled and able to work better.

2.2.4 Benefits of E-government

Digitized government services provide several benefits to the government which successfully adapts to them. Table 2.1 from Alzahrani (2011) shows some benefits for citizens, businesses and governments. For the case of G2G sector, transactions amongst the government agencies are faster and easier. According to Omb (2003), the exchange of vital information across various agencies through the use of online services would be accurate and fast when compared to the traditional ones. The states are trying to take advantage of e-government in many of their activities, such as enhancing accountability, producing more accurate and efficient services, eliminating costs and saving employee's time that is consumed by daily jobs as asserted by Jaeger (2003); Shim and Eom (2008). Moreover, efficiency in deliveries and effectiveness in provisions of the government operations is also enhanced (Parent et al.2005, Carter and Weerakkody, 2008).

On the other hand, the commercial sector can also take advantage of the electronic services offered. Precisely the private sector can recognize the merits and in turn take advantage of the e-government in order to permit greater competition and improve its efficiency. Early in 2002, Allen Consulting Group put into considerations the benefit of the higher economy as a result of usage of electronic services. This includes in-

creased labour markets, control of supply chains and reduction of delivery (Noie, 2003). Furthermore, it was highlighted in several studies Hecks, (2001); Ebrahaim & Irani, (2005); Trkman & Mccormack, (2010) that combination of efforts with the government and the private sector can expand business opportunities as a result of increase in awareness of the e-government (Jaeger, 2003). Moreover, the cost effectiveness and convenience can be obtained through e-procurement resulting in high standards services of both the government and businesses. Additionally, it can ease the operation of the agencies in procurement operations.

From the perspective of citizens', at present governments are required to play a vital role in their lives. Cooperation between government and citizens has the potential of make life easier for the citizens (Kumar et al. 2007; West, 2004). Through implementing the concept of shopping from one gateway, citizens are expected to exhaust everyday transactions without engaging themselves in agency services, such as, license renewal for drivers, passport issuance, payment of taxes and applications for benefits (Hasson, 2001).

Citizen	Business	Government
• Eradicate bureaucracy; • Cost and time reduction; • Provision of a convincing relevant access of information; • Giving options in deliveries; • Prolonged availability of services; • Quick and timely responses. • Practice of justice in all government processes. •	• Cost reduction resulting in increased efficiency; • Upgrade procurement operations; • Creation of business ideas and projects together with the government; • Easily socializing with the government.	• Improvement of employee productivity; • Making optimum use of interactions amongst the agencies regarding correction of mistakes and errors in jobs; • Increased savings both in cost and time; • Eradicate difficult task; • Curb corruption; • Smooth functioning of the government operations by making it more efficient and reliable.

Table 2.1: Benefits of E-government, as from Alzahrani (2011).

2.3 M-government

Governments, worldwide have come up with initiatives to deliver services and provide online information to its citizens, public organizations and businesses. Researchers and analysts have recently started paying attention to the benefits of wireless mobile applications technology (m-government) to both the public and private sector as an evidence of e-government (Liu et al., 2014). These subsections below define the concept of m-government and its association with one of the e-governments.

2.3.1 What is m-government?

M-government can help make public information and government services available "anytime and anywhere" to the parties involved in e-government including citizens, businesses and all government agencies.

M-government is understood to mean the involvement of wireless networks and mobile technologies, like, PDAs, or laptops in public and private sector operations to aid in mending public information and government provisions anytime, anywhere (Alhadidi et al. 2010). This benefits the government as work is made easier, simpler and more automatic, resulting in benefits to citizens, businesses and employees.

Sultana et al (2016) defined m-government as the use of all types of wireless and mobile phones to provide government services and information to citizens, businesses and other government agencies.

The International Telecommunication Union (2011) defined m-government as, “an extension or evolution of e-government through utilisation of mobile technologies for public service delivery”

The mobile government is an important channel for offering citizens with suitability and instant accessibility to government information and services with relatively inexpensive public services (Abu-Shanab, 2015).

Mobile government services are government information and services that are offered from through Short Message Service (SMS), Government Mobile Application (Apps) or Government kiosks. The main aims of m-government services are: 1) privatization of service; 2) offer facilities; 3) appropriateness of service; and 4) implementation of public services by using the wireless services and internet (Al-Hubaishi et al, 2017) Recently, many countries around the world have adopted m-government services. The mobile

technologies and wireless services could be used within the government agencies to offer government services and information to citizens and businesses (Saif et al, 2017)

Alrowili et al in (2015) mentioned that "M-government services is a term that used to describe the various services that governments provide using mobile technology. Mgovernment provides citizens as well as government employees with required information and services by using their mobile device. Government sectors now try to obtain the benefits of m-government to improve their work and to provide good services and information".

M-government is a good option for delivering many services to the citizens such as: health appointments in the health sector, the results of exams in the education sector; weather forecasting as well. Also, m-government services may offer some benefits to the citizens including: access anytime; convenience; access anywhere; as well as cost and time-saving (Babullah et al, 2015).

Mobile government services is subset of e-government services. M-government is a good channel for the communication between governments and citizens by using some technical advancements such as cell phones, smartphones and tablet (Ohme, 2014).

The citizens, businesses and government agencies used mobile technologies to access government services from anywhere, at any time, so m-government used mobile technologies to communicate with, and offer services to end users (The citizens, businesses and government agencies) via the mobile services (Althunibat et al., 2014).
Based on the above discussion, I am accepting the following definition of mgovernment for the purpose of my dissertation: m-government is defined as the employment of devices such as cellular/mobile telephones, iPads and personal digital assistants (PDAs) in order to provide government information and services anytime and anywhere to citizens, businesses and government agencies.

A number of questions has been considered in this context, including whether mgovernment can replace e-government activities. While several researchers do not believe in the complete replacement, arguing that it should be conceived as complementary to e-government efforts (Lallana, 2004; Östberg, 2003; Kushchu and Kuscu, 2003). This is because m-government may provide the additional value of supporting the mobility of its users, whilst retaining the benefits of the e-government efforts that offer provisions in line with the wired networks (Chang & Kannan, 2002;

Goldstuck, 2003; Abanumy and Mayhew, 2005; Kim et al., 2004; Sholl, 2005; Antovski & Gusev, 2005).

Those ideas were echoed by Cilingir and Kuschu (2004) in their interpretation of mgovernment as definitely complementary to e-government, subject to the condition that the former requires the presence of the latter, since without the former, no infrastructure exists. However, it was noted that such dependency does not render the mgovernment an extension to e-government and it doesn't enhance the efficiency of the existing unique benefits hence creating the value, which in its ability offers unique benefits. Cilingir and Kuschu (2004) argued that m-government must be incorporated into the design of e-government.

Indeed, there is a study shows that most people use the web via their mobile phones and suggests that PC may soon lose its dominance in terms of internet access (Tan, 2006). Therefore, the importance of e-government can be upgraded in an mgovernment giving citizens the opportunity to go through it anywhere and anytime for accessing government information via the internet.

In summary, the improvements in wireless and mobile technology in hand with the embracement by public of the new technologies will likely to steer the e-government services and applications to m-government as a newer model . M-government constitutes an alternative additional channel to provide services unable to be availed by the e-government only.

2.3.2 Classification of M-government

Just like e-government, m-government has four models (Heeks and Lallana, 2004), namely:

1) Mobile government and the government agencies: involves association between the government and the agencies (mG&G).

2) Mobile government and business: involves the government and the private operating sectors (MG&B).

3) Mobile government and employee: interactions between the government and employees in their offices (MG&E)

4) Mobile government and citizen: concerns association of government with its citizens (MG2C).

The model that is most widely known internationally is the mobile government to citizens (Ntaliani, Costoplou and Karetsos, 2008). Henceforth, I am focusing on my exploration on usage of this type of m-government commodities from the citizen's point of view. Besides improving the government provisions m-government applications can improve its productivity and effectiveness of public servants (Hecks and Lallana, 2004). Trimi and Sheng (2008), distinguished the following three categories in m-government services;

1) Informational: one way transmission sent in form of governmental alarms and notifications via communication.

2) Transactional: revolves around government and users who do interact freely through the online services.

3) Operational: in this group, the online operations of government are performed by giving citizens access to the required information through mobile devices.

2.3.3 The Enabling Technologies in M-government

It is considered that there are more superior variety of the permitting technologies which are different from those that are directly impacting on m-government. According to the research by Trifonova and Ronchetti (2006), a mobile device can be recognised to be a convenient device that can be used anywhere and anytime. The mobile devices may be termed as the suitable technology conduit resulting to a success in delivery of governmental commodities with the support of operators' mobility. The enabling technology conduits which are in a great use in the m-government are recommended in provisions of governmental commodities to its citizens. According to Trimi and Sheng (2008), this characterised the appropriate technologies suitable for mgovernment according to the following categories:

1) Personal Digital Assistant (PDAs): this can be identified as a portable device which consists of an individual computer and a telephone headset. Personal Digital Assistance (PDA) contains calendar, multimedia, voice recorder and has a high capability of getting connected to the Internet when one is checking emails or browsing;

2) Cellular Phones that were used in the past to perform few functions such as making a call or receiving a call and writing or receiving a short message only.

Nowadays, these conduits have more complex functionalities and are well connected to network which gives the operator a chance to access Internet and either send electronic mails or browse the internet;

3) The Smart Phones are conduits that comprise both PDAs and mobile phones functioning systems. Smart Phones are used for delivering messages and communication through voice, sending electronic mails, browsing the Internet and reaching multimedia services;

4) Tablet PCs which includes iPads have modified the way people interact with other PCs, and are triggering higher espousal in mobile businesses/government world (Fenn, 2010).

2.3.4 M-government in Developed Countries

In Australia, m-services and SMS services are used to deliver information to citizens in different sectors. For instance, they are used in schools in Sidney to provide pupils' parents with school alerts (e.g. event reminders, school breaking news, information related to attendance and safety). Another application of m-services is the Fire Short Message Service-based service, this SMS is sent in order to alert the citizens about fire tragedy within a distance of fifteen kilometres (Rannu, Saksing and Mahlakõiv, 2010).

Similarly, in the USA, m-government projects are being delivered to citizens in various sectors. For instance, 'My Mobile Virginia' is a mobile application in Virginia State that provides several m-services to citizens, like, informing them about disastrous prevailing conditions, governmental information, supplicant lists, election notices, tax-related information and tourism information. Furthermore, SMS-based services are also used by the US government to interact with its citizens, for instance, to inform them about street cleaning schedules, as well as to remind them to shift their cars to avoid getting parking tickets. Additionally, 'California on the Go' is a form of m-government service in California that was established in July 2001 by the US government to render immediate information to citizens regarding vigour warnings, traffic jams, state raffle results, and any information released by press from the offices of the government. In addition to these information, the Global Positioning System (GPS) was implemented in order to assist drivers in saving time while driving and providing them instant updates regarding traffic jams, traffic lights, and traffic flows (Trimi and Sheng, 2008).

Furthermore, the government of United States continues to launch current mobile applications across the country (Gahran, 2010).

Estonia is recognised to be the leading country in providing m-government services, with the mobile penetration coverage of 100% and higher. Hence, SMS tool was widely adopted by Estonian government so that it could provide information and communicate with citizens (Rannu, Saksing and Mahlakõiv, 2010). Referring to KPMG survey of 2009 (a global network of professional firms providing Audit, Tax and Advisory services), considered Estonia to be the most developed market for mobile payments (m-payment) in the central and east European region. Additionally, there is m-parking service which is helpful and widely known service in the whole Estonia, ever since its introduction in 2000 (Rannu, Saksing and Mahlakõiv, 2010). For example, the city of Tartu is offering the following:

1) Mobile Parking: this application allows Estonian residents to pay parking fees through the use of mobile phones;

2) The Mobile Bus Ticket: this application allows citizens to pay for their bus fare by use of mobile phones;

3) T-number: this is a recognised service that sends information about visiting the attractions in Tartu to individuals through their mobile phones;

4) Mobile Payment: is used by clients to make payments for purchasing products or services from shops and restaurants;

5) M-neighbourhood watch: this is a SMS-based service that is used by Police control unit to send alerts to all taxis and drivers, security companies and other people, regarding public matters such as persons who are missing and stolen cars;

6) M-library: this is a service used by Tartu City library to send notifications to mobile phones of readers who are waiting to have access to either a book, movie or an audiotape that is currently accessible in the library.

The Canadian government has launched a Wireless Portal' project which provides governmental information to the citizens of Canada (Trimi and Sheng, 2008). Some of the m-government services that were introduced in the project included information regarding economic indicators, passport services and the Canadian government press

releases. Furthermore, the Canadian police officers adopted m-services for giving out tickets, accessing databases, accessing the record-management system, and reviewing vehicle registrations and license tags.

The Europe Union is considered to be the most sophisticated in terms of mobile technology, when compared to other regions in the world (Trimi and Sheng, 2008). This leadership in m-services use is mainly due to the larger penetration rate of mobile phones, which increased from 90 per cent to 100 per cent, in the period between 2004 and 2007 (Trimi and Sheng, 2008). Additionally, the approval of m-government services has been accelerated due to the wide acceptance of m-technology. For example in London, citizens can be subscribed by the London Police Department to receive Short Message Services about the security threats, and urgent situations alerts. In addition, drivers can pledge to the Bus Operator Metro line to a message concerning their timelines so as to speed up or slow down, and keep up an even distance between the two. This SMS-based service is provided after ascertaining the location of buses through an appropriate mobile tracking system.

In Austria, a portable device is used by the parking inspectors to connect to the main parking database in order to verify whether the parking slot payments have been made (Trimi and Sheng, 2008). Sweden is also among the worldwide leaders in mtechnology, where the incursion of mobile phones ownership exceeds 95 per cent of the population. Additionally, some m-government services are accessible all over the country, such as SMS-based service for publishing employment vacancies, mobile parking payments system, the government supervisor service, tax services, mobile healthcare providers, and MapMate as a wireless map system (Östberg, 2003). Finland is among the countries where mobile phones are used as IDs, based on an application developed by the Finnish telecommunication firm, Sonera. Hence, personal identification is fixed on the SIM card code (Subscriber Identification Module), which is used is the same manner as the passport system (Trimi and Sheng, 2008).

Japan is another country where people can get information concerning road transport networks such as traffic jams, road constructions, car accidents, accessible parking lots, and weather conditions. These services are provided by the Vehicle Information and Communication System (VICS). Furthermore, Japan has been using the old fashioned service of the m-government.

A project named as 'M-police' was introduced in Korea so as to assist police officers in retrieving information about stolen vehicles, the lost driver's licenses, vehicles' histories, and pictures of suspects through mobile devices on recoveries . This application helped in finding suspects and missing cars very quickly. Furthermore, PDAs and small printers are being used by parking inspectors in Anyang City to gather information, thereafter they produce receipts immediately. Additionally, the Tax Management System that was approved and accepted in Uijeongbu and Kunsan cities allowed the officers to retrieve information about car assessment, get information about observant taxes, and then transfer the information immediately to the neighbouring tax database (Jeong and Kim, 2003).

The main m-government services that are accessible to the citizens of Singapore are as follows:

1) HPB (Health Promotion Board) Mobile Portal: citizens can acquire heath information and travel orders;

2) CPF e-Appointment SMS Alert: this is a service provided by hospitals to patients, to remind them about their appointments, a day in advance;

3) Police Crime Alert Service: these are notifications sent by the police centre to citizens. This service is offered to individuals who are subscribed with the Singapore Telcos to receive SMS notifications about crimes that have occurred in the locality;

4) Supreme Court mobile Information Service: this service sends SMS-based information about trials and hearings before judges and registrars to people who request for the same.

2.3.5 M-government in Developing Countries

M-government services could be 'web-based' and 'non-web based' (Misra, 2010). Hussain and Imran (2014) have mentioned that web-based platforms generally are web-portals made to suit mobile applications and m-apps which require internet connection. On the other hand, in the non-web based platforms, short message services (SMS) and interactive voice response (IVR) are used.

There are many m-government services which are delivered by many governments around the world to their citizens through web-based and SMS (non-web based)

services. For example, the citizens in developed countries are using m-government services through the web. However, some developing countries offer various mgovernment services mostly through SMS (non-web based way) (Hussain and Imran, 2014).

Asia was recognised to have the majority of its population as mobile subscribers in 2017. Asian countries have high prospective for adoption of mobile technology. The following are mobile services that have been launched in Philippines (Ghayasi and Kushchu, 2004):

1) TXT CSC: it is the service that is used by citizens to convey their complaints to government agencies, mainly to the Civil Service Commission (CSC) in Philippines, as a way of enhancing effectiveness and swiftness of service delivery (Lallana, 2004).

2) In Criminal Offences reporting: citizens can send SMS to the pertinent authorities about any illegal offenses, to help authorities in taking a quick feat.

Dubai Government came up with its SMS services in 2003. These services included SMS services that can renew driving licenses, traffic information, health card renewals and trade license renewals. The city of Dubai also supports information concerning air travel, the disbursement of traffic charges and information pertaining to trade permit eminence. The advantages of the solo face portal include; allowing people to apply for a visa, police services such as traffic charge sheet investigation and payments, as well probing for hotels, scrutinizing arrivals/departures from Dubai Airport, and obtaining diversion roads and monetary services information (Ewan, 2006).

2.4 E/M-government Adoption

Despite the local and national government's investments and efforts to provide the public with e/m-services, there is a minimal service uptake by the people (Wang, 2003; Wang, 2014; Liu et al, 2014; Fu et al, 2012; Abdelghaffar and Magdy, 2012; Reddick, 2014; Kumar et al., 2007; Osman, 2013; Choudrie and Dwivedi, 2005; Mamte et, al., 2013; Wadie and Hasan, 2015; Carter and Belanger, 2004b; Liang and Lu, 2013; Ahmad, 2015; Belanger and Carter, 2008). The citizens prefer traditional methods in accessing government services including in-person visits (Belanger and Carter, 2008; Abdelghaffar and Magdy, 2012; Ahmad, 2015). The implication being that there is a low rate of electronic or mobile government adoption (Liu et al., 2014; Wang, 2014).

Several research studies have been conducted in the UK to examine the consciousness of people and their adoption of electronic government services and information. The survey conducted by Choudrie and Dwivedi (2005) amongst 1600 households revealed that only 6% of the participants had registered for e-government service while 76% of them were unaware of the so-called government gateway. The authors suggest that the government could be having insight into a low rate of e-government adoption among the concerned people. In 2016, the citizen adoption rate rose to 83 percent (Carter et al., 2016).

The study conducted by Carter and Belanger (2004) in the U.S regarding acceptance of G2C electronic government services found that 52% of all the participants were utilizing such services. A similar study established that 68% of all the taxpayers in the country used the electronic method in filing their tax returns in the year 2005 (Gallant et al., 2007). In 2016, the rate of adoption has increased to 83 percent (Carter et al., 2016).

There is still low to moderate uptake of G2C e-government services information in many nations. For instance, the average use of the Canadian government website was only 30% in the year 2007 (Kumar et al., 2007). In 2005, the acceptance of electronic government information and services by the Hungarian and Polish citizens was 23% and 27% respectively (Al-Adawi, 2005). In Poland, the rate of adoption rose to 30 percent in 2015 (Ewa et al., 2015).

Third World nations still continue to experience low levels of G2C e-government adoption (Wadie and Hasan, 2015; Wang, 2003; Fu et al., 2006; Liang and Lu, 2013). According to Fu et al. (2006), the Adoption rate in 2006 had risen to 40%. By 2013, the adoption rate had increased up to 75.5% (Liang and Lu, 2013). These statistics are a clear indication that the country is not yet ready to abandon the old paper based system of filing tax returns.

In a country like Jordan, the households that knew about the e-government services stood at only 31% by 2007 (MoICT, 2007). According to Ahmad (2015), the rate had only risen to 37 % by 2015. A survey conducted in Kuwait by AlAwadhi and Morris (2008) revealed that only 23.6 percent of the respondents were applying the egovernment services. By 2015, the rate rose to 45% (Wadie and Hasan, 2015).

However, the adoption rates of these services by citizens all over the world has been lower than expected and it restricts governments from comprehending the full potential of the benefits of using these services (Wang et al., 2012; Hung et al., 2013; Carter and

Belanger, 2008). According to the United Nations publications (2012) "the level of e-government adoption is generally low, even in the most advanced countries: the average usage rate is 32 per cent only in EU27 countries, and 40 per cent in OECD countries. Governments have been putting efforts to understand as to which factors influence citizens to accept and start using these services (Liu et al., 2014; Wang, 2014).

The above discussion clearly indicates there is a need to conduct further studies on the acceptance of G2C electronic government systems because of the low rate of acceptance of electronic government services and information amongst the citizens. The main aim of this research is to help government to come up with appropriate strategic decisions for meeting the needs of its citizens after understanding the factors that influence citizen acceptance of mobile government services.

There is a need for more research studies on the reasons for the acceptance of electronic government services and at the same time making the citizens understand the importance of adopting the systems as well as mobile government services (Gilbert et al., 2004; Alhujran and Chatfield, 2008; Tung and Rieck, 2005; Choudrie and Dwivedi, 2005; Carter and Belanger, 2005; Reddick, 2005). The factors that influence the mobile government acceptance in Saudi Arabia have been analysed in this study.

2.5 Summary

This chapter provides the review of the literature on both e-government and mgovernment. Therefore, e-government and m-government are used to make the delivery, access and transactions of government work simpler, easier and more automatic. In addition, e-government and m-government make government work more automatic and efficient, so the governments can benefit their citizens, employees and businesses. My literature review also noted that m-government constitutes an alternative additional channel to provide services, in some areas where the e-government fails. The referenced literature has outlined major role of e-government, which is to improve the relations between the government, business, citizen, in order to inspire political, social, and economic development in the country. The referenced literature has also outlined major role of mobile government which is to improve services to both private and public organisations. Additionally, it is in aid to developing effective e-government commodities to citizens, where e-government is considered ineffective, such as in remote locations (rural and mountains areas), where there is no infrastructure to underpin fixed telephone lines. Therefore, mobile services can be approached as a

communication medium between the government, the citizens and organisations. The connection between the e-government and m-government is collaborative, mgovernment cannot be recognised to replace the e-government, and in fact it has been observed to complement the e-government. My literature review also noted that mobile penetration rates are growing quickly all over the world. Therefore, in some of the developing countries, where internet dispersion remains low due to issues concerning communication and people's promptness, but mobile phones are high, m-government becomes an enhanced option.

3 CHAPTER THREE: THE SAUDI CONTEXT

3.1 Introduction

This chapter considers the background of the country under investigation (The Kingdom of Saudi Arabia). A short introduction has been presented in the beginning of this chapter, which mainly concerns the geography, location and the people. Then, the details are presented about the government, political systems and technological capabilities.

3.2 The study Context

The Kingdom of Saudi Arabia (KSA) was chosen to conduct a field work study of the instant research because the author of this dissertation is from and is sponsored by that country. The e-government project of KSA has been in the focus of substantial attention and support from the uppermost ruling classes. According to the UN eGovernment survey (Untied Nation, 2014) it ranked the 105th on e-government development in the year 2003 as mentioned in Table 3.1. After ten years, it ranked 36th on egovernment development because the online portal offers A-Z government web indexes. The portal also offers extensive mobile and SMS services, an e-participation portal, government forms which are easily accessible online, a developed open data portal with data available in various formats, as well as a whole of e-government strategy.

Year	2003	2004	2005	2008	2010	2012	2014
Ranked	105	90	80	70	58	41	36

Table 3.1: The progress of KSA in E-government by UN e-Government Survey.

3.3 Saudi Arabia Country

The kingdom of Saudi Arabia (KSA) was established on 23rd September 1932 by the King Abdul-Aziz Al-Saud. Geographically, KSA is located at the southwest corner of Asia, which places it in the crossroads of the three continents which includes Asia, Africa and Europe. The country occupies an area that exceeded two million square kilometers, nearly 80 percent of the Arabian Peninsula (Ministry of Foreign Affairs,
2016). KSA is recognized to be amongst the largest countries in the Middle East, while

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in world it is ranked 13th (Brown, 2005). It shares its borders with Jordan, Kuwait, Iraq, the United Arabs Emirates, Qatar, Oman and Yemen. The kingdom's climate varies from desert to mountains. The eastern part is the largest and well known as sandy and stormy. It also contains the largest oil reserve (around 25%) (MOPM, 2009). Makkah and Medina

cities were recognized to be the source of the Islamic religion and their custodian, the kingdom played a major role of hosting and organizing more than two million pilgrims, who attended from every part of the world so that they can carry out Hajj on specific and partial days (Hajj is an essential journey to Makkah that is mainly done by the adult Muslims once in their life time).

3.3.1 Political System

Saudi Arabia is known to be a monarchical government where the king plays the role of a ruler and that of the prime minister. The king is ordained by either the former king or members of the Royal families (Saudi portal, 2016). The crown prince is recognized as the second person in the state and is appointed by the king. The Council of Ministers comprise of twenty-nine governmental members, mainly chosen by the king. The major role of this council is to counsel the King (Saudi portal, 2016). It meets every Monday, and these meetings are chaired by the King. The judicial system in KSA is mainly outlined in Islamic laws (Sharia). The Ayal decree A/90 in Article one indicates that KSA is a sovereign Arab Islam state as the religious contributes is recognized as a Holy Qur`an while the prophets are known as Muhammed (peace be upon him) in Sunnah (traditions). The communication language is Arabic. Its capital is Riyadh. The provincial governments have such leaders as Governor, Deputy Governor who are appointed by the King.

Figure 3.1: shows the map of Saudi Arabia with its thirteen provinces.

3.3.2 People

Islam is recognised as the major controller of the lives of the people of Saudi Arabia. Unity within the family and tribal system are key factors recognized in Saudi Arabia. Family is regarded as a key factor that promotes social support in the country as indicated by Al-saggaf and Wagga (2004). Family is normally defined as an extended one and includes grandparents, parents, children, cousins, aunts, and uncles. Normally, the sons and daughters leave their home when they find a companion. The eldest son is recognized to be the pillar of the family, even when he is married. He has the role of taking care and offering protection to his parents particularly when they become older.

Women in Saudi Arabia play a role that is different from role of women in developed societies and Western countries (Al-saggaf and Wagga, 2004). Saudi women have to put on a veil known as Abaya when they move out of their homes. Men support women financially, whether they are mothers, daughters, wives and even the divorced or widowed women. Gender seclusion is a particular culture characteristic that exists in social life. This gender separation is witnessed when both boys and girls are separated due to creation of different institutions such as girl school, universities for girls, even some shopping centers, bank branches and health departments. A research conducted by Al-saggaf and Wagga (2004) found that there some online forums which outline

female related issues. For instance, more than one million registered member at Hawaa online forums (www.hawaaworld.com), the large number were found to be dominated by women (Hawaa World, 2010).

3.3.1 Population

The census conducted in 2015 under the Ministry of Economy and Planning (MOEP, 2016) showed that the population in Saudi Arabia was 31,742,308, including approximately ten million foreign workers and their families as mentioned in Table 3.2. A third of the population is under 20. The younger population can really encourage the government to speed up the process of implementing mobile services since it is known to be more motivated to accept technology (Venkatesh et al. 2003).

Age Groups	**Saudi Citizens**			
	Male	**Female**	**Total**	**%**

Under 20 years old	3975282	3744042	7719324	37.1%
20-24	1056682	1013024	2069706	9.9%
25-29	1035805	1022709	2058514	9.9%
30-34	949965	949808	1899773	9.1%
35-39	826478	837028	1663506	8%
40-44	701227	711523	1412750	6.8%
45-49	557221	562594	1119815	5.3%
50-54	445764	449544	889308	4.2%
55-59	502793	325764	338813	1.6%
60-64	496151	238641	257510	1.2%
Over 65	781482	354786	426696	2%
Total	10571443	10203463	20774906	100.00

Table 3.2 Saudi Arabia Population by Age and Gender

Source: Ministry of Economic and Planning (2015)

3.3.2 Internet Technology in Saudi Arabia

In March 1997, King Abdul-Aziz's City for science and technology (KACST) was given the permission by the Council of Ministers to come up and operate internet services. After that, King Abdul-Aziz's City for science and technology (KACST) established the Internet Services Unit (ISU) and assumed the responsibility of developing all regulations and policies to manage the same. The ISU is also responsible for providing technical support to the local Internet Services Providers (ISPs), universities and other governmental agencies (Allehaibi, 2001). The Saudi government has allocated the Saudi Telecommunication Company (STC) (a previous governmental agency that was privatized in 1998) to play a significant role in connecting the country to the international internet service providers. Also, STC plays a role in managing all the communications

gateways and providing the communication infrastructure across the country. In 2004, the responsibility of communication, which was played by ISU, was shifted to Communication Information Technology Commission (CITC), following a governmental choice (ISU, 2009). The CITC became a solitary government authority in issuing licenses operating public communication networks, as well as providing communication and information technology services to the country (CITC, 2007). The ISU is responsible for intensive care internet traffic or web filtering.

The use of the internet in Saudi Arabia had grown to a million (users) by the end of 2006, while in 2015, 21.6 million was recognized by the Ministry of Communication and Information Technology (CIT) (Mulleh, 2007; MCIT, 2015).

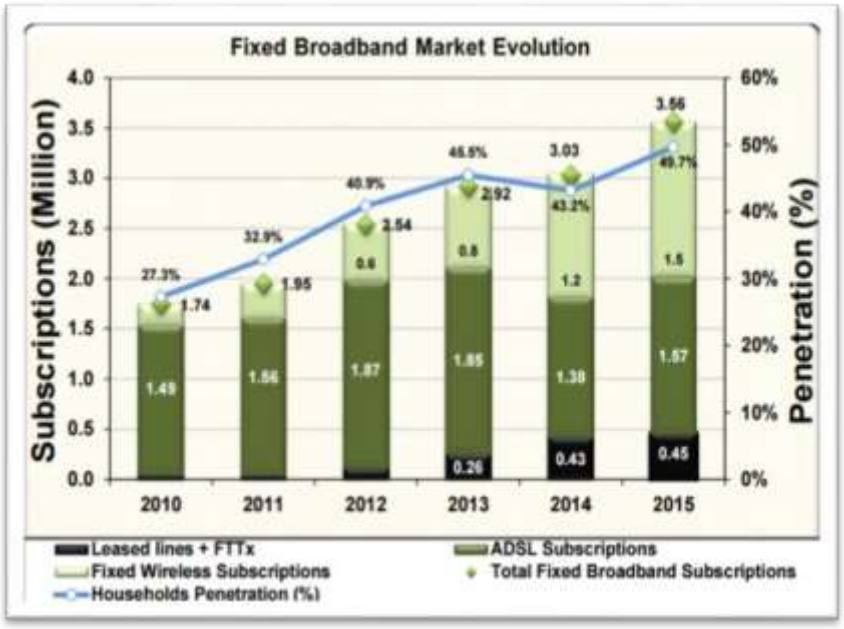

Figure 3.2: Growth of broadband service in the country.

The STC was given a permission from (the government) to start a service aiming at controlling the competition in the broadband market (CITC, 2007). In the year 2006, the STC come up with a project that could improve the communication infrastructure of the country which included the broadband division (Alriyadh, 2007c).

3.3.3 Mobile Telecommunication

In 2014, the number of mobile subscribers in Saudi Arabia reached 53 million, which is 1.67 more than the population. At the same time, the CITC has provided Mobile Virtual Network Operators (MVNOs) licenses that focus on improving services and customer care. By the end of 2013, Saudi Arabia was found to have 51 million mobile users, which is 169% of the population, so the smartphone use is estimated at 73%.

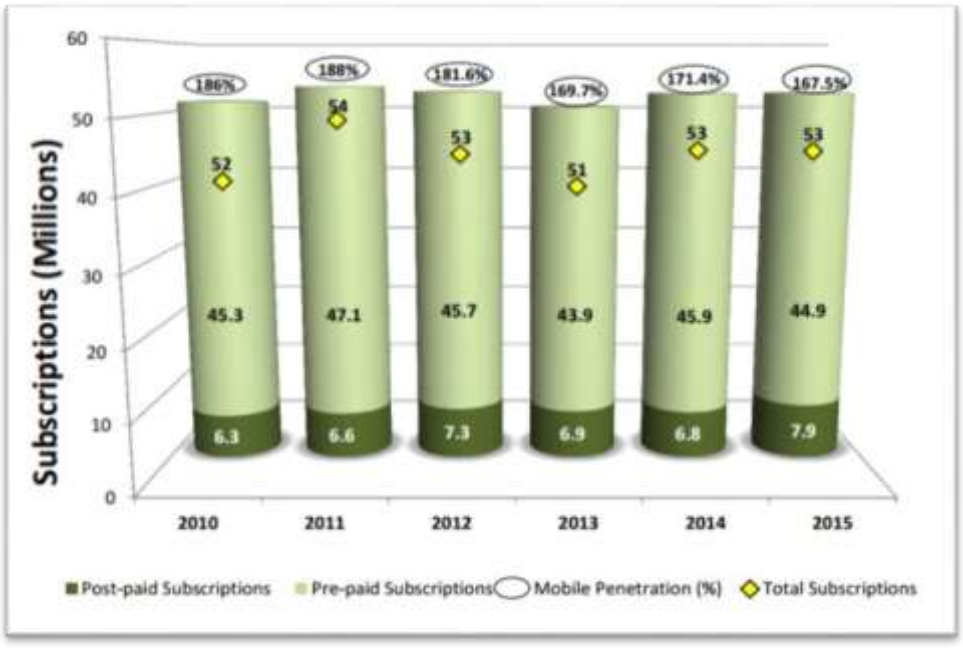

Figure 3.3: Mobile service market growth- total subscriptions.

	Top 10 countries with the highest Smartphone penetration				Top 10 countries with the highest Mobile penetration		
	Smartphone penetration				Mobile penetration		
	UAE		74%		Hong Kong		
	South Korea		73%		UAE		
	Saudi Arabia		73%		Panama		
	Singapore		72%		Finland		

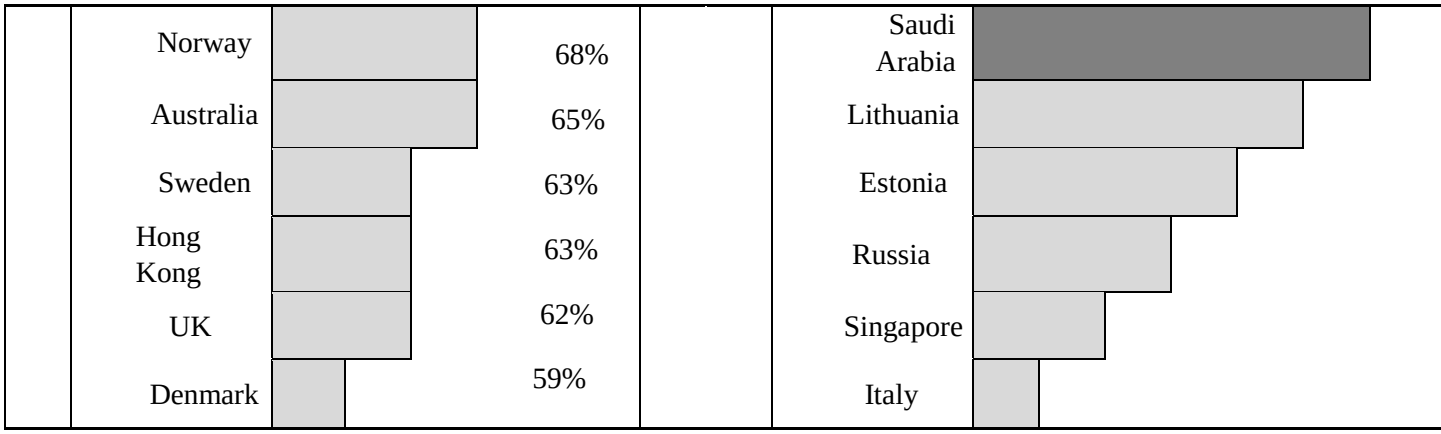

Figure 3.4: Saudi Arabia ranks 3rd in Smartphone and 5th in Mobile Penetration (2013)

3.4 E-government in Saudi Arabia.

Yesser program plays the role of enabling the implementation of e-government (Yesser, 2015). It reduces, as much as possible, centralization in e-government implementation while ensuring the minimum level of coordination between government departments. It was sub divided into four principles as shown in Figure 3.4

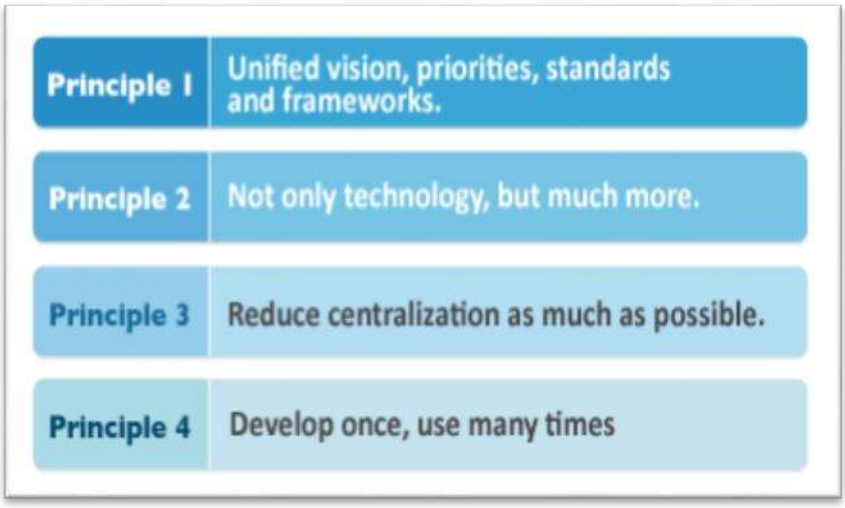

Figure 3.5: The four principles of the Yesser program (Yesser, 2012a)

The programme was started in 2005 and the initial budget for that programme was 3 billion. In 2009, 400 different e-services had emerged in the national portal egovernment transaction site (www.saudi.gov.sa) and government agencies and the number increased to 2500 by 2015 (Yesser, 2015). Saudi had mainly focused in their vision since the

beginning of the e-government. It mainly focused at providing better services to the citizens, residents, businesses and governmental agencies as it was clearly outlined by the e-government declarations. They hoped that at the end of 2010, all citizens in the kingdom would be able to access and enjoy the services from everywhere without time limitations (Yesser, 2012a). In 2015, Saudi Arabia ranked third out of 22 Arab countries in providing e-government services, 8th out of 47 in Asian countries and 36th out of 192 globally (United Nations, 2015).

The country has come up with many large-scale projects which focus on Yesser program, including National Centre for Digital Certification project. This project is a security-integrated system which mainly deals with relocating data between different organisations (NCDC, 2012) which provide services to e-government and ecommerce. Sadad is also recognized as another implemented project that focuses on aiding the Yesser program, which was conducted by Saudi Arabian Monetary Agency (SAMA) in 2004 (Sadad, 2012). This project aimed at national payments over electronic channels (e.g. branches, ATMs, phone banking, and Internet banking). Sadad project is considered an important initiative for Yesser program, as it facilitates financial transactions of the user with any registered organization. It also allows making payment to the government.

3.4.1 E-government Services

The number of provided e-government services reached 2500 in 2015, which represented 89.1% of the total number of services which the government was supposed to render. The reaming 10.9% (279 services) covers the traditional government services (the citizens here need to physically visit the services providers). When classifying egovernment services according to the stakeholders, 51.4% are delivered to citizens (G2C), 26.9% delivered to businesses (G2B), 14.5% delivered to government organizations (G2G), and 7.2% delivered to all beneficiaries (Yesser, 2015). From the point of view of categorisation of services delivered, then among 2500 e-government services delivered, (15.3%) were informative, 21.5% were interactive, 47% were procedural, and 16.2% were integrated (Yesser, 2015).

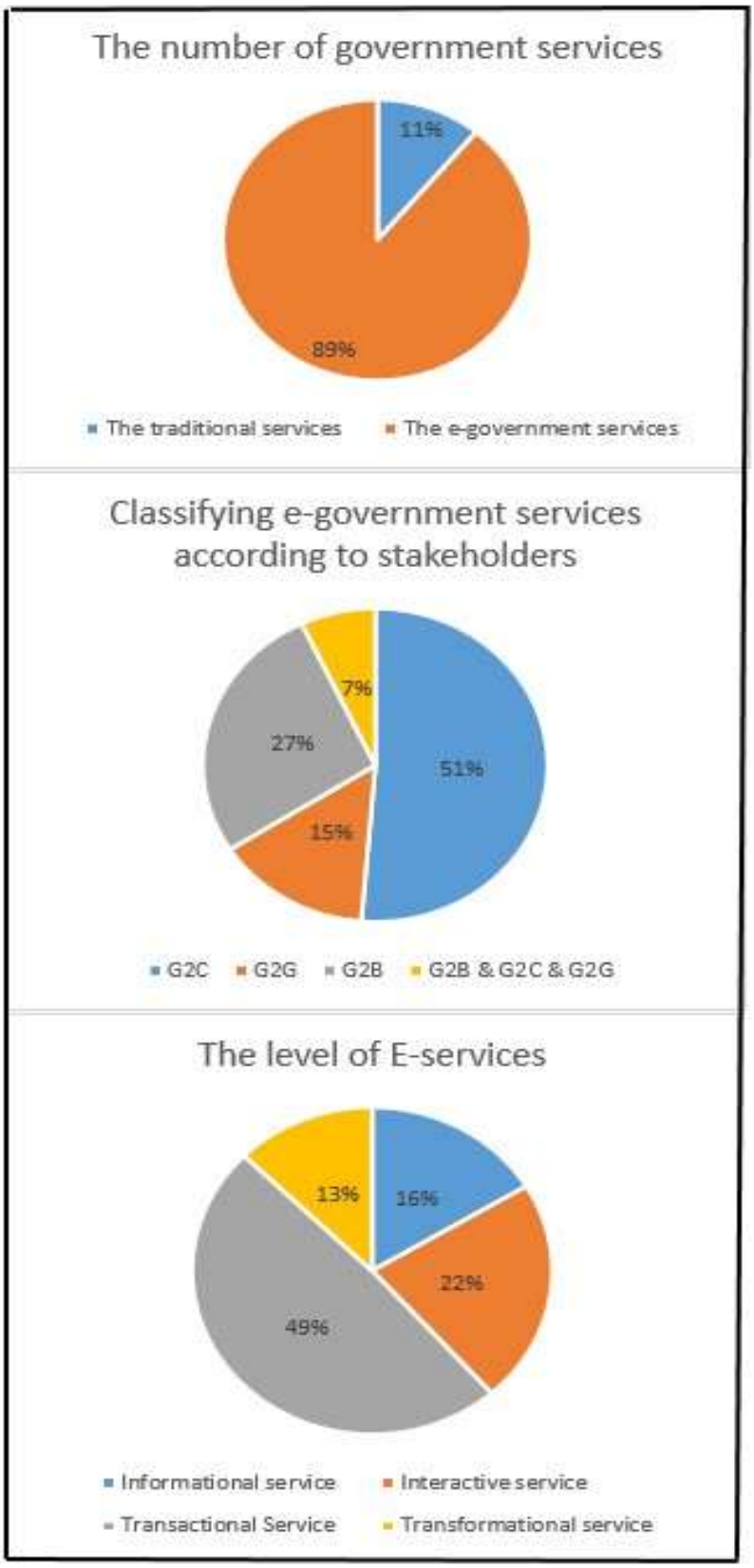

Figure 3.6: E-government services in Saudi Arabia (Yesser, 2015).

3.5 M-government Services

Saudi Arabian people may spend around 5 hours a day connected to the Internet via desktops and laptops. Also, they may spend another 3 hours a day connected to the Internet from through their mobile phones (United Nations, 2015). From these numbers, the Saudi government has started providing government services on mobile devices, m-government services are available to citizens anytime and anywhere using phonebased applications (Yesser, 2015).

In (2005), Yesser was launched by the Saudi government, to provide a support to every government agencies in digitizing services. Yesser was the (2010) winner of the EGovernment FutureGov Awards for the transformation of government agencies to egovernment services (United Nations, 2015).

According to the UN e-Government survey (Untied Nation, 2014) it ranked the 80th on e-government development in the year 2005. After ten years, it ranked 36th on egovernment development because the online portal offers A-Z government web indexes. The portal also offers extensive mobile and SMS services, an e-participation portal, government forms which are easily accessible online, a developed open data portal with data available in various formats, as well as a whole of e-government strategy. Therefore, Table 3.3 mentioned the summary of e-government development in Saudi Arabia

Starting in (2012), the Saudi government launched a complementary m-Government initiative to help government agencies create and launch mobile-based applications (United Nations, 2015).

Yasser has launched the official application of the m-government in Saudi Arabia (Maak) for Android and iPhone devices in 2015 (Yesser, 2015).

In the same year (2015), Saudi Arabia won the top awards in the health, tourism and education sectors in the Best M-Government Awards announced annually by the United Arab Emirates (United Nations, 2015).

The messaging Gateway (SMS) was launched by Yesser in 2012 to provide a method to send and receive messages using SMS to support e-services delivery to citizens,

businesses and all the government agencies through a single gateway (Yesser, 2016). "The Children's Vaccination Reminder App" was launched by Ministry of Health (MOH) in 2015 to remind parents of the dates of basic vaccinations against the diseases targeted by vaccination, according to the new MOH Vaccination Schedule (Ministry of Health, 2015).

"Saffer App" was launched by Ministry of Education (MOE) in 2014 to help the student who are studying outside the country (Yesser, 2016).

"Abshr App" was launched by Ministry of Interior (MOI) in 2015 to help the citizens, residents and business to finish their transaction with the Ministry of Interior (Yesser, 2016).

Therefore, Table 3.4 mentioned the summary of m-government development in Saudi Arabia

E-government Development in Saudi Arabia										
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
	Yesser was launched by Saudi government.									
	E-government in Saudi Arabia ranked the 80th on e-government development by UN e-Government survey.									
				E-government in Saudi Arabia ranked the 70th on e-government development.						
						E-government in Saudi Arabia ranked the 58th on e-government				
						Yesser was the winner of the E-Government (FutureGov) Awards				
	E-government in Saudi Arabia ranked the 41th on e-							government		
										E-government in Saudi Arabia ranked the 36th on e-government

Table 3.3: The summary of e-government development in Saudi Arabia

<table>
<tr><td rowspan="9">M-government Development in Saudi Arabia</td><td>2012</td><td>2013</td><td>2014</td><td>2015</td><td>2016</td></tr>
<tr><td colspan="5">The Saudi government launched a complementary m-Government initiative</td></tr>
<tr><td colspan="5">The messaging Gateway (SMS) was launched by Yesser</td></tr>
<tr><td colspan="2"></td><td colspan="3">“Saffer App” was launched by Ministry of Education (MOE)</td></tr>
<tr><td colspan="3"></td><td colspan="2">Yasser has launched the official application of the m-government in Saudi Arabia (Maak).</td></tr>
<tr><td colspan="3"></td><td colspan="2">Saudi Arabia won the Best M-Government Awards announced annually by the United Arab Emirates.</td></tr>
<tr><td colspan="3"></td><td colspan="2">“The Children’s Vaccination Reminder App” was launched by Ministry of Health (MOH)</td></tr>
<tr><td colspan="3"></td><td colspan="2">“Abshr App” was launched by Ministry of Interior (MOI)</td></tr>
</table>

Table 3.4: The summary of m-government development in Saudi Arabia

3.5.1 Government Text Messaging System (Tarasol)

The government central text messaging system (Tarasol) is one of the services launched by the e-government transactions program to increase the effectiveness of communication and interaction between the government agencies and the beneficiaries from their services (including individuals and enterprises). This system, which is related to the governmental channel Takamol, aims to provide short text messaging services. At the same time, it also aims to provide a sophisticated and safe channel to take advantage of this government system (yesser, 2016b).

The e-government program (Yesser) aims to transform short text messaging central system Tarasol into an electronic platform for setting up and exchanging short text messages. Also, it aims at message storing, tracking and retrieving to be used on a large scale by various government agencies. Therefore, there was a consideration to all government agencies that were provided with options to send electronic messages directly through the internet or through a short text messaging gateway.

3.5.2 National Contact Centre (Aamor)

The National Call Centre for e-government program (Aamor) was established after approval by the Supreme Supervisory Committee for e-government program Yesser, to make it a unified call center for government agencies through different channels (Yesser, 2015). This center aims to operate according to the best technical and security specifications, and contribute to the achievement of strategic objectives of egovernment transactions in the Kingdom (Yesser, 2016a).

This center provides responses to the inquiries of public and beneficiaries of egovernment program. Also, it provides support and information regarding egovernment services and transactions offered by government agencies to beneficiaries.

This center serves all beneficiaries who use e-government services, with the aim of delivering a swift counseling and assistance, providing them with technical support, and communicating with them in more than one way. Therefore, various channels of communication are used to communicate efficiently with beneficiaries, e.g. phone, email, website, text messages, as well as fax and social networks.

3.5.3 Mobile Government transactions (Maak)

The m-government product Maak has been introduced in order to create an attractive and relevant environment for the growth of this type of services in the Kingdom. Yasser has launched the official application of the m-government Maak for Android and iPhone devices. Through Maak, official governmental applications forms can be downloaded.

3.6 Why Saudi Arabia

The main reasons behind choosing Saudi Arabia for this study are:

1) Saudi Arabia is considered as an example of a developing country that has insufficient e-government facilities (United Nations, 2010).

2) On the other hand, Saudi Arabia is considered to be one of the technology leaders in Arab and Islamic countries (Alied, 2011). It hosts the Organisation of Islamic Cooperation (OIC). In addition, the Kingdom is one of the Middle Eastern members of the Group Twenty G-20. Last but not least, the Kingdom plays an important role in the International Monetary Fund (IMF) and the World Bank. Hence, Saudi Arabia is the only Middle Eastern country among the top 20 members of the IMF (Alied, 2011).

3) As the literature review above suggests, very little is available regarding the adoption of m-government services in the middle-east, Asian, Arabic and Islamic countries, thus there is a gap in finding out the factors influencing the acceptance of using m-government services.

4) Very high level of cooperation has been offered by the Saudi authorities and educational institutions since this study has been sponsored by Saudi government.

5) The researcher's familiarity with the culture and the language.

3.7 Summary

This chapter has highlighted the characteristics of Saudi Arabia, where my current study has been conducted. Thus, I've provided an overview of its geographic, political, demographic and social features. Additionally, the chapter presented an overview about

the state-of-the-art of ICT in general in Saudi Arabia, as well as the implementation of e-government and m-government programs, including examples of programs and projects that have been implemented.

4 CHAPTER FOUR: PRIOR WORK

4.1 Introduction

This chapter reviews the relevant literature regarding the implementation and adoption of mobile government and electronic government services in the developing and developed nations across the globe. It starts with a description of the major theories and models of technology adoption, putting more emphasis on the technology acceptance model (TAM). It also examines the factors that determine the use of electronic government services.

4.2 Models of Technology Adoption

"The acceptance or the use of a new technology" is referred to as technology adoption (Agarwal, 2000) and has been the focus of many research studies. These studies have developed many theories and models to comprehend the behaviour of individuals in respect to their adoption of new technologies. The following subsections present some of these theories and models, specifically those that are used widely in research on e-government adoption.

4.2.1 Diffusion of Innovation (DOI)

According to Rogers (1995), this theory has been previously applied in marketing, communication, education and anthropology to explain user adoption of new technologies. Rogers (1995) defined diffusion as "the process by which an innovation is communicated through certain channels over time among the members of social systems". An innovation, according to Rogers (1995) is "an idea, practice, or object that is perceived as new by an individual or another unit of adoption". Rogers (1995) mentioned that the adopters of any innovation should learn about it before they can adopt it. This learning process which is named "adoption process" is divided into five major stages:

1) Awareness: when people learn about a new idea but they do not have any information about the idea.

2) Interest: when someone identifies a specific idea and starts looking for information about it.

3) Evaluation: the individual mentally applies the new idea to his/her present and anticipated future situation and then decides whether to try it or not

4) Trial: when someone tests the usefulness of a particular idea in his/her life by trying it.

5) Adoption: the person makes the commitment to use a particular idea after deciding on its utility.

Furthermore, Rogers (1995) mentioned some of the features that influence the decision to use a particular innovation or an idea:

1) Relative advantage: how the current innovation is better than the previous one.

2) Compatibility: the consistency of the new idea with the past and the present needs of the adapter.

3) Complexity: the extent of difficulty in understanding the innovation.

4) Trialability: the extent of experimentation and testing the innovation before its adoption.

5) Observability: the visibility of the outcomes to other people.

4.2.2 Theory of Reasoned Action (TRA)

This theory was previously used in various settings and is based on an intention model (Chau, 1996; Chen et al., 2002; Karahanna et al., 1999; Davis et al., 1989; Ajzen and Fishbein, 1980; Venkatesh and Smith, 1999; Fishbein and Ajzen, 1975). According to this theory, the best predictor of the behaviour is the behavioural intention. Davis et al. (1989) defined behavioural intention as the strength of an intention to perform a particular behaviour. The intention is determined by subjective norms like social influence and an individual's attitude (Fishbein and Ajzen, 1975). Subjective norm is defined as beliefs about what others will think about the behaviour (Fishbein and Ajzen, 1975). The attitude toward a specific behaviour is "the attitude prior to a person to perform certain behaviour" (Fishbein and Ajzen, 1975).

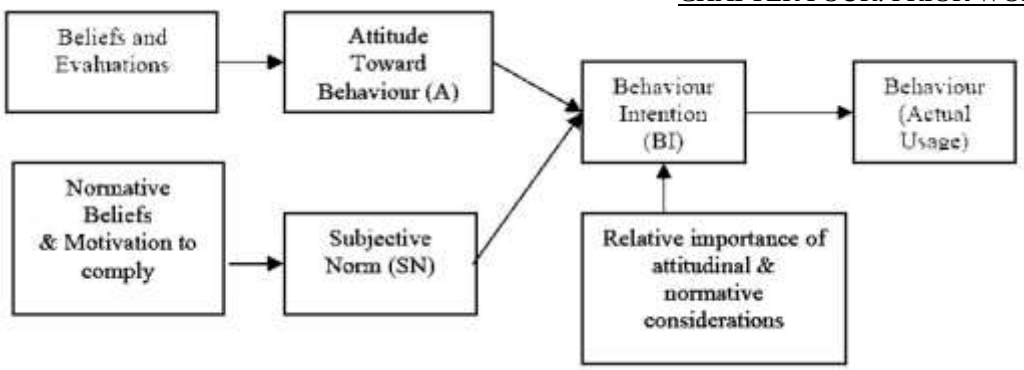

Figure 4.1: Theory of Reasoned Action (Fishbein and Ajzen, 1975).

4.2.3 Theory of Planned Behaviour (TPB)

Ajzen (1985) extended the Theory of Reasoned Action (TRA) by adding a third factor which is known as perceived behavioural control (PBC). This changed model of Theory of Reasoned Action (TRA) is named as the theory of planned behaviour (TPB). His theory has been well accepted in predicting and explaining behaviour (Sheppard et al., 1988). It has also been found suitable in providing a valuable framework for explaining and predicting the acceptance of new information technology (Hung et al., 2006). Accordingly, the new factor in the theory of planned behaviour (TPB) which is perceived behavioural control (PBC) and it is defined as the "perception of ease or difficulty of performing the behaviour of interest" (Ajzen, 1991). Intention is seen as a best precursor in explaining and predicting certain behaviour in theory of planned behaviour (TPB). This implies that the intention in theory of planned behaviour (TPB) is determined by three constructs: (1) attitude toward behaviour, (2) subjective norm (SN) and (3) perceived behavioural control (PCB) (Ajzen 1991)

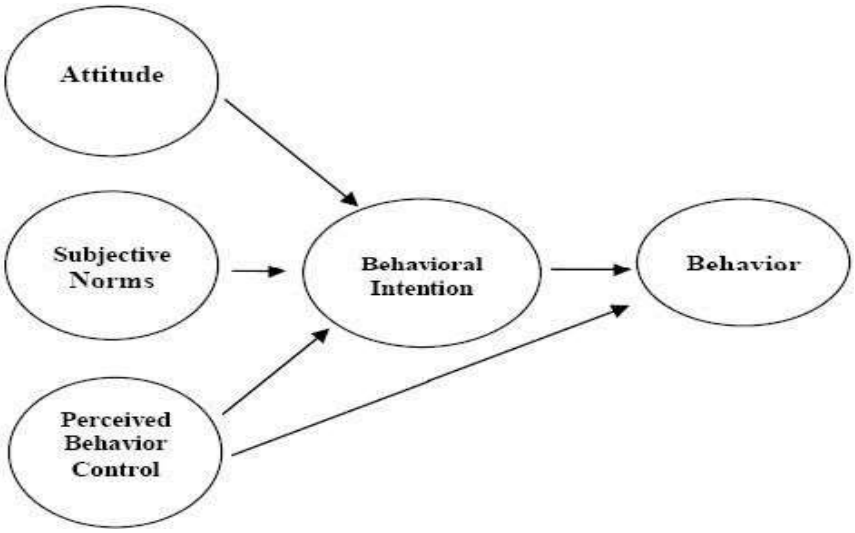

Figure 4.2: Theory of Planned Behaviour from Ajzen (1985).

4.2.4 Technology Acceptance Model (TAM)

Originally developed from TRA (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980), Technology Acceptance Model (TAM) is widely used in forecasting and explaining motivational underlying factors that motivate users to accept and adopt new information technology systems. Perceived ease of use (PEOU) and perceived usefulness (PU) which are the core determinants of IT and acceptance behaviour (Davis, 1989; Davis et al., 1989). Davis (1989) defined perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance". He defined perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort". Fishbein and Ajzen (1975) defined behavioural intention as the strength of one's intention to perform a specified behaviour".

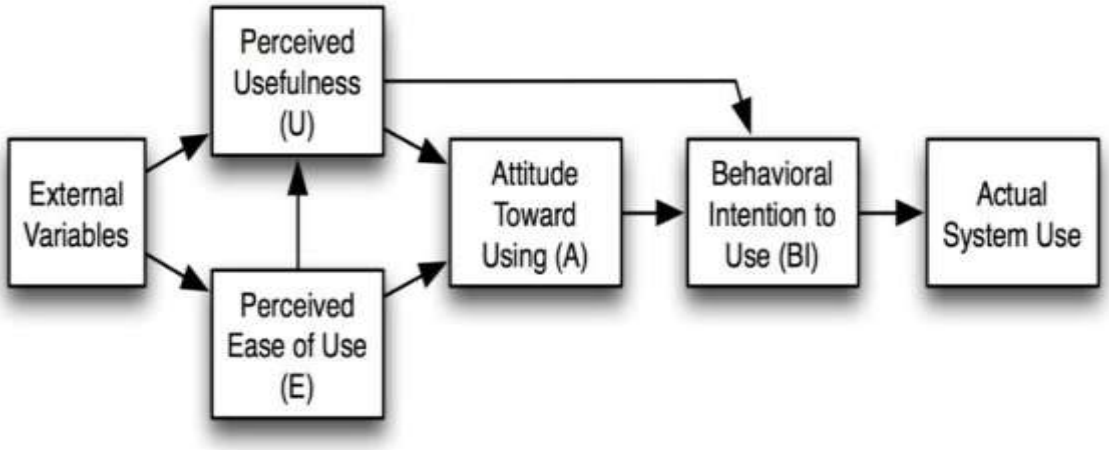

Figure 4.4: Technology Acceptance Model (Davis, 1989).

4.2.4.1 Advantages of TAM

A number of studies have found TAM to be highly credible (Ma and Liu, 2004; King and He 2006; Shumaila et al., 2007). It can explain up to 40% of the behavioural intention (Burton-Jones and Hubona, 2006; Venkatesh and Davis, 2000). Researchers have acknowledged and used it for:

1) Email, voicemail, graphics, etc.(Adams et al.,1992; Davis,1993; Hendrickson,1993; Jackson et al.,1997; Karahanna,1993; Mathieson,1991; Szajna,1996).

2) E-commerce (Palou, 2001, Moon and Kim 2001, Gefen et al., 2003, Gefen, 2000).

3) E-learning (Arbaugh, 2000, Martins and Kellermanns, 2004).

4) Internet Banking (Lai and LI, 2005; Al –Sukkar and Hassan, 2005; Chan and Lu, 2004).

5) E-government (Fu et al., 2006; Warkentin et al., 2002; Al-Adawi et al., 2006; Seyal and Pijers, 2004).

Several researchers argued that TAM presented useful instruments (Chen et al., 2007; Pavlou, 2003), noting its main known imperfection that it does not incorporate social influence factors (Fu et al., 2006; Mathieson, 1991), to which it was later extended. In particular, Venkatesh and Davis (2000) incorporated their TAM2 cognitive and social variables, specifically experience, job relevance, image and voluntariness.

4.2.5 Unified Theory of Acceptance and Use of Technology (UTAUT)

It was developed as a result of blending 8 models of technology that was made by Venkatesh et al. (2003): (1) the theory of planned behaviour, (2) the theory of reasoned action, (3) the motivational model, (4) a model combining the theory of planned behaviour, (5) the model of PC utilization and innovation, (6) the innovation diffusion theory, (7) the technology acceptance model, (8) the social cognitive theory.

The UTAUT model was acknowledged by Venktasesh et al. (2003) as a vital tool of measuring the likelihood of technology acceptance in organisational settings. In this theory (UTAUT), the main determinants of usage behaviour (Venkatesh et al., 2003) are:

1) Performance expectancy: person's beliefs about how vital the system is to him/her.
2) Effort expectancy: how the system will be easy to operate
3) Social influence: the measure to which a person can be impacted by others
4) Facilitating conditions: defined as "the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003).

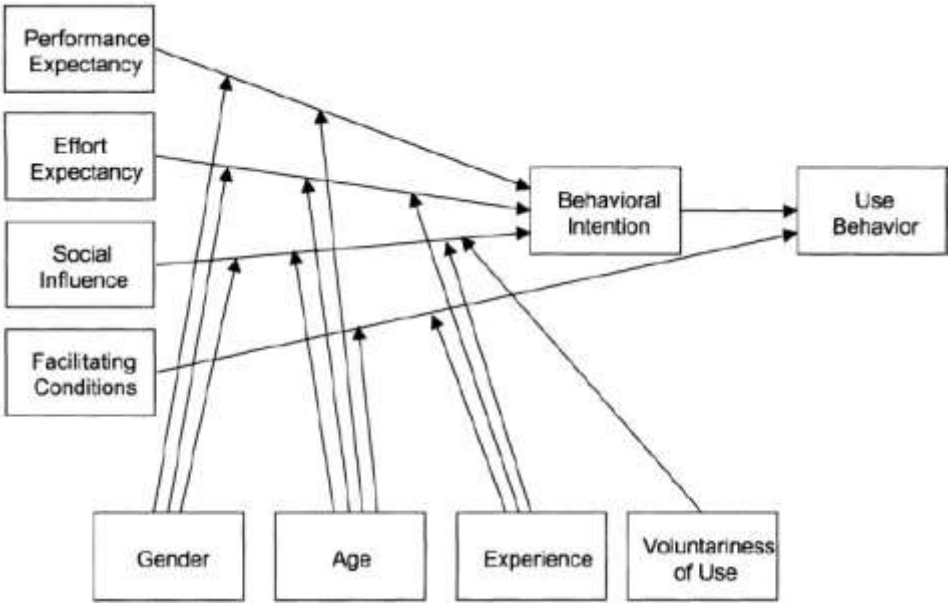

Figure 4.3: Unified Theory of Acceptance and Use of Technology Venktasesh et al. (2003).

UTAUT also suggests that the variables of gender, prior experience, age and voluntariness moderate the main relationships in the model (Venkatesh et al., 2003). This includes gender, prior experience, age and voluntariness along with other less important and not consisted at the time factors in the model, including anxiety, computer self–efficacy and attitude toward using the knowledge of know how (Venkatesh et al., 2003).

4.3 Factors of E-government Implementation and Adoption

Reddick (2005) categorized the prior literature on e-government adoption into supplyside and demand- side streams.

The supply-side research focused on the challenges facing the implementation of electronic government services which included IT groundwork, monetary resources, personnel skills and resistance to change (Ciborra and Navarra, 2005; Holden et al., 2003; Moon, 2002; Norris, 2003; Norris and Moon, 2005).

The demand-side research focused on the public service customers (Reddick, 2005) and dealt with the factors such as trust, culture, perceived usefulness and perceived ease of use.

4.3.1 Supply-side

The major part of other researches has focused on the supply-side perspective, especially on availability and sophistication level on the e-government rendered services. The factors affecting technology as well as the implementation and adoption of electronic government services studied a few factors that included the following:

1) The business plan and strategy (Shahnewaz and Ahsan, 2015; Stephen and Janneke, 2010; Thong et al., 2000; Kawalek and Wastall, 2005; Janssen and Cresswell, 2005),

2) Management support and leadership role (Nugi, 2012; Al-Shehry et al., 2006; Stephen and Janneke, 2010; Quanxi and Elhadi, 2014; AlShihi, 2006; Chatfiled and Alhujran, 2007b; McClure, 2001; Ndou, 2004),

3) Government capability and structural characteristic (Norris and Demeter, 1999; Shahnewaz and Ahsan, 2015; Quanxi and Elhadi, 2014; Holden et al., 2003; Kaylor et al., 2001; Moon, 2002; Moon and Norris, 2005; Norris and Moon, 2005),

4) Conflict to change (Nugi, 2012; Ndou, 2004),

5) Technical concerns (Nugi, 2012; Al-Shehry et al., 2006; Shahnewaz and Ahsan, 2015; Stephen and Janneke, 2010; AlShihi, 2006; Bourn, 2002; Dillon and Pelgrin, 2002; Ebrahim and Irani, 2005; Ferro et al., 2007).

4.3.2 Demand-side

Recently, many countries around the world are promoting the use of m/e-government services by their citizens. Given the potential of m/e-government services to accessing the various governments' services at anytime and anywhere, many researchers have investigated the factors which influence the adoption of e/m-services. while Table 4.1 summarises the studies with the main factors influencing m/e-government adoptions in the literature.

The Author	The Year	The Coun-try	The Model	The Factor
Rehman et al	2016	Pakistan	(TAM)	Perceived usefulness, perceived ease of use, web support, ICT infrastructure, awareness, service quality, information quality, perceived risk, information security, transaction security, trust in the internet, and trust in the government.
Al-Hubaishi et al	2017	UAE	The service quality	Interaction quality, environmental quality, information quality, system quality, network quality, outcome quality.
Babullah et al	2015	Saudi Ara-	UTAUT2	Performance expectancy,

		bia		effort Expectancy, social influence, facilitating conditions, hedonic motivation, perceived risk, innovativeness, behavioural Intention
Ohme	2016	Germany	TAM/ TPB	Perceived usefulness, perceived ease of use, subjective norm, perceived behavioural control, perceived risk, an attitude towards mobile government, intention to use mobile government.
Althunibat et al	2014	Jordan	TAM	Perceived usefulness, perceived ease of use.
Alrowili et al	2015	Saudi Arabia	TAM	Perceived usefulness, perceived ease of use, time, and attitude towards mobile government, intention to use mobile government, trust, and experience.
Mensah	2017	China	TAM	Perceived usefulness, perceived ease of use, intention to use e-government, trust, perceived service quality
Ahmed et al	2015	Sudan	TAM	Perceived usefulness, perceived ease of use, trust, quality of service, citizens' satisfaction and advertising.
Mensah and Jianing	2017	Ghana	TAM	Perceived usefulness, perceived ease of use, computer self-efficacy, perceived service quality, demographic

				factors, trust in local government, trust in the internet and perceived risk.
ElKheshin	2016	Egypt	(TAM)	Perceived usefulness, perceived ease of use, attitudes in e-government, behaviour intention to use egovernment services, trust in the government, trust in the internet, website design, perceived public, gender, education level, age.
Alsaif	2013	Saudi Arabia	UTAUT	performance expectancy, effort expectancy, awareness of the system, compatibility, gender, social influence, age, experience, level of education, trust in the internet, trust of the government, behavioural intention, computer self-efficacy, the quality of information and the system quality.

Alharbi	2016	Saudi Arabia	UTAUT2	Performance expectancy, effort expectancy, habit, social influence, facilitating conditions, tangible security features, general information security awareness, user interface quality, cyber security, law, security culture, security perception, privacy perception, trust,
				behaviour intention.
Bhuasiri et al	2016	Thailand	UTAUT	performance expectancy, facilitating conditions, social influence, and perceived credibility, Perceived autonomy and perceived competence and effort expectancy Perceived risk.
Sharma	2015	Oman	The service quality	Reliability, security, efficiency and responsiveness, demographic variables, namely, age and education level of respondents.
Abu-Shanab	2015	Jordan	TAM/UTAUT	Perceived usefulness , perceived ease of use, social influence, perceived compatibility, perceived cost of service, perceived responsiveness, intention to use SMS services.

Saif et al	2017	UAE	UTAUT	Performance expectancy, effort expectancy, social influence, facilitating conditions, behavioural intention, awareness, trust in government, trust in technology
Sultana et al	2016	Developing countries	UTAUT	Performance expectancy, effort expectancy, social influence, facilitating conditions, behavioural intention, perceived public value, trustworthiness.

Kurfalı et al	2017	Turkey	UTAUT	Performance expectancy, social influence, facilitating conditions, trust of Internet, effort expectancy, trust of government.
Almuraqab and Mansoor	2017	UAE	TAM	Perceived ease of use, perceive usefulness, social influence, and awareness and age.
Almuraqab	2017	UAE	TAM/ DOI	Compatibility, perceived ease of use, social influence, trust in technology, perceived usefulness and trust in government.
San et al	2017	Malaysia	UTAUT	Performance expectancy, social influence, facilitating conditions, effort expectancy, perceived security risk, perceived privacy risk.

Carter et al	2016	US/UK	TRA	Trust of internet, perceived of risk, perceived of ease of use, perceived of usefulness, trust of internet, trust of government.
Okunola	2015	Nigeria	--	Ease of use, convenience, Website quality, security and support, barriers, perceived benefits, trustworthiness and user satisfaction.
Okunola et al	2016	Nigeria	--	Access to computing facilities, previous Internet experience, previous egovernment experience,
				location, gender, age, education, employment and income.
Wadie and Hasan	2015	Kuwait	UTAUT	Effort expectancy, social influence, performance expectancy and facilitating conditions.
Liu et al	2014	China.	TAM	Perceived usefulness, perceived ease of use, integrity and social Influence.
Hung et al	2013	Taiwan	TAM	Perceived usefulness, perceived ease of use, trust, interactivity, external influence, interpersonal influence, self-efficacy, and facilitating conditions.

Aloudat et al	2014	Australia	TAM	Attitude, perceived usefulness, behavioural intention, perceived ease of use and the individual's privacy.
Osman	2013	Sudan	TAM	Perceived usefulness, perceived ease of use, intention to use mobile systems, trust, age and experience.
Omar	2013	Jordan.	UTAUT	The performance expectancy , effort expectancy, social influence and trust.

Table 4.1: The studies with the main factors influencing m/e-government adoptions.

From the above table, there are few studies of m/e-government adoption have been conducted in Arabic countries. Also, the adoption rates of these services by citizens all over the world has been lower than expected and it restricts governments from comprehending the full potential of the benefits of using these services (Wang et al., 2012;

Hung et al., 2013; Carter and Belanger, 2008). According to the United Nations publications (2012) "the level of e-government adoption is generally low, even in the most advanced countries: the average usage rate is 32 per cent only in EU27 countries, and 40 per cent in OECD countries". Governments have been putting efforts to understand as to which factors influence citizens to accept and start using these services (Liu et al., 2014; Wang, 2014). Therefore, it clearly indicates there is a need to conduct further studies on the acceptance of G2C mobile government services because of the low rate of citizen acceptance of mobile government services and information. The main aim of this research is to help, in this case Saudi government to come up with the appropriate strategic action to meet the needs of its citizens after understanding the factors that influence citizen acceptance of mobile government services.

4.4 Summary

The main theories and models in the study are: Diffusion of Innovation (DOI), Theory of Reasoned Action (TRA), Theory of planned behaviour (TPB), Unified Theory of Acceptance and Use of Technology (UTAUT) and Technology Acceptance Model (TAM). There is no study in m-government context specifically considering Saudi Arabia in particular, which the topic of this dissertation is.

There are many reasons that reinforced our decision to choose TAM for our study rather than any other model. These reasons are mainly related to the characteristics of TAM which distinguish it from other models. TAM model is a widely credible model and used in many research studies (Shumaila et al, 2007). TAM is also regarded as a trustworthy empirically proven tool (Chen et al, 2007). TAM was used in many studies for evaluation of users' adoption for technologies such as emails (Adams et al, 1992), electronic commerce (Gefen et al., 2003), electronic learning (Martins and Kellermanns, 2004), internet banking (Al- Sukkar and Hasan, 2005) and e-Government (Fu et al., 2006). It was discovered in several studies that 'perceived usefulness' and 'perceived ease of use' constructs together have the ability to explain a big proportion of variance in "intention to use IT" (Shumaila et al, 2007).

5 CHAPTER FIVE: THE DEVELOPED MODEL

5.1 Introduction

This chapter presents the developed model that is based on TAM with additional external factors: perceived trustworthiness, perceived service quality, user's satisfaction and perceived mobility. The justification for this selection follows below.

5.2 The Developed Model

Chapter 4 presented the theories and models that were developed to investigate the factors which affected the adoption of specific technology in a society, including the TAM (Technology Acceptance Model, Davis, 1989). TAM model is composed of 5 main constructs which are: perceived usefulness, attitude towards behaviour, perceived ease of use, intention to use and, finally, actual use (Davis, 1989). There are many correlations between these constructs. For instance, perceived usefulness and attitude towards use have been known to affect intention to use (Davis, 1989).

TAM has been validated by researchers in 2 different ways. The first validation was based on its main variables where perceived usefulness and perceived ease of use got validated through reliability and validity scale. The second validation of TAM was based on its links with other variables such as behavioural intention and actual behaviour.

As mentioned previously, TAM was used in many applications and fields. However, in the majority of cases, TAM was adopted by editing the links between its original constructs, or by including additional relevant variables and constructs including user experience, subjective norm, awareness, user's satisfaction, citizen trust along with interface design and some others. (Carter et al, 2016; Ahmed, 2015; Carter and Belanger, 2005; Carter and Belanger, 2004b; Hung et al, 2006; Fu et al, 2006; Warkentin et al, 2002; Wangpipatwong et al, 2008; AL-Thunibat, 2011; Abdelghaffar and Magdy, 2012). This study extends TAM by considering perceived mobility, perceived service quality, users' satisfaction and perceived trustworthiness as shown in Figure 6.1 and further justified below

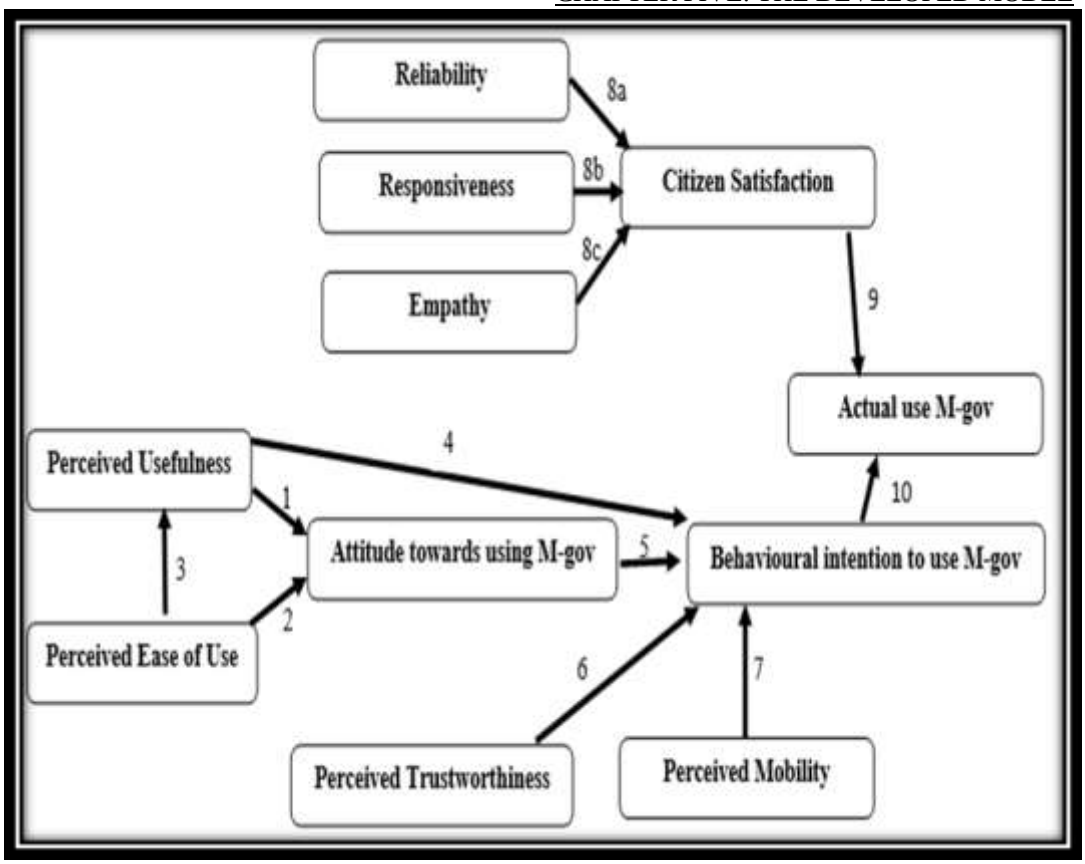

Figure 6.1: The developed Model

5.2.1 Perceived Usefulness

Perceived Usefulness (PU) is one of the key components of TAM. This construct corresponds to the degree to which the user of an IT technology perceives its benefits that lead to a continuous use of it (Davis, 1989). The mobility and ubiquity of mgovernment services are the main features distinguishing it. Based on the prior research, referenced in Table 6.1, I have formulated the following hypotheses:

Hypothesis 1: Perceived usefulness positively affects user's attitude towards using mobile government services.

Hypothesis 4: Perceived usefulness positively affects the intention to use mobile government services.

Hypothesis	The references
Hypothesis 1: Perceived usefulness has affected the user's attitude towards using mobile government services.	Davis et al. (1989); Seyal and Pijers (2004); Warkentin et al. (2002); AlAdawi et al., (2006); Fu et al., (2006).

Hypothesis 4: Perceived usefulness has a positive influence on intention to use mobile government services.	Davis et al. (1989); Fu et al., (2006); Warkentin et al., (2002); Al-Adawi et al., (2006); Seyal and Pijers (2004).

Table 6.1: The references are in support of Hypothesis 1&4

5.2.2 Perceived Ease of Use

The perceived ease of use (PEOU) has an impact on user's intention to use technology (Davis, 1989). It corresponds to the degree of awareness of the user about the easy and effortless use of mobile government services. The ease of use of mobile government services should affect the awareness of the user about the benefits of using these services and thus, should affect their attitude toward these mobiles services.

Based on the prior research, referred in Table 6.2, I have formulated the following hypotheses:

Hypothesis 2: The perceived ease of use positively affects the user's attitude toward mobile government services.

Hypothesis 3: The perceived ease of use positively affects perceived usefulness.

Hypothesis	The references
Hypothesis 2: The perceived ease of use has affected the user's attitude toward using mobile government services.	Davis et al. (1989); Seyal and Pijers (2004); Fu et al., (2006); Al-Adawi et al., (2006); Warkentin et al., (2002).
Hypothesis 3: The perceived ease of use has affected perceived usefulness.	Davis et al. (1989); Gefen and Keil (1998); Igbaria et al. (1996).

Table 6.2: The references are in support of Hypothesis 2&3

5.2.3 Attitude

This component was defined by Ajzen (1991) as the degree to which an individual has positive or negative evaluations about a specific behaviour. It has been considered in several studies that it leads to the intention of use. In a study conducted by Taylor and

Todd (1995a), attitude was identified to have a positive relationship with behavioural intention to use. In online shopping, it was demonstrated that customers' attitude had an impact on their intention to adopt online shopping services (Vijayasarathy, 2004). Therefore, that research revealed that attitude had a significant positive effect on individual's intention. All these studies have highlighted the association that exists between attitude towards the use and intention to use.

Based on the prior research, referred in Table 6.3, I have formulated the following hypotheses:

Hypothesis 5: Citizen's attitude towards m-government services positively affects his/her intention to use these services.

Hypothesis	**The references**
Hypothesis 5: Citizens' positive attitude towards m-government services will have a strong impact on his intention to use these services.	Ajzen (1991); Taylor and Todd (1995a); Vijayasarathy, (2004); Chen e al. (2002); Wu and Chen (2005); Sahari et al. (2012); Ha and Stoel (2009).

Table 6.3: The references are in support of Hypothesis 5

5.2.4 Perceived Mobility

Mobility of a device refers to the feature of dealing with information provided by this device whilst in state of mobility (Hung et al., 2013). The mobility of m-government services mean that they can be used independently at any point of time, from any location, and without any wired network (Hung et al., 2013). This important characteristic of m-government services makes them very useful when the user needs them whilst being far from home or office. Hence, the degree of mobility should increase the user's intention to use mobile government services (Hung et al., 2013).

Perceived mobility is defined as the degree to which mobile technology can affect potential benefits to the user, such as communication, access to information and services as well as their availability anytime and anywhere. Although more work is required to show the effect of mobility on IS adoption, many prior research has considered mobility as an essential factor affecting user's intention to use mobile services (Hung et al., 2013). Based on the prior research, referred in Table 6.4, I have formulated the following hypotheses:

Hypothesis 7: Perceived mobility positively affects the intention to use mobile government services.

Hypothesis	The references
Hypothesis 7: User perceived mobility has affected the intention to use mobile government services.	Hung et al. (2013); Faziharudean and Li-Ly (2011); Hong, S.-J., et al. (2008).

Table 6.4: The references are in support of Hypothesis 7

5.2.5 Perceived Trustworthiness

Belanger et al. in (2002) defined perceived trustworthiness as "the perception of selfconfidence in the e-marketer's reliability and integrity". This is explained by the fact that citizens' confidence in m-government services is a requirement for their intention to use these services. Consequentially, citizens' fear effects and delays their intention to adopt and use m-government services. Furthermore, trust was proved to significantly affect participation intention through usage and attitude (Palvia, 2009). In another study, Wei et al. (2009) demonstrated that there is relationship between m-commerce adoption and trust. Additionally, many researchers considered trust as crucial factor for adopting electronic government services (Horst et al., 2007; Warkentin et al., 2002; West et al., 2008; Belanger and Carter, 2008).

Based on the prior research, referred in Table 6.5, I have formulated the following hypotheses:

Hypothesis 6: User trust in mobile government services positively affects his/ her intention to use these services.

Hypothesis	The references

Hypothesis 6: Increased user trust in m-government services will positively affect his intention to use these services.	Belanger and Carter (2008); Horst et al., (2007); Welch et al. (2004); Welch and Hinnant (2002); Walle et al. (2002); Sahari et al. (2012).

Table 6.5: The references are in support of Hypothesis 6

5.2.6 Perceived Service Quality

A quality of a service can be defined as the inconsistency that links a consumer's perceptions and expectations about specific services that are provided to them (Yaghoubi et al., 2011). This makes service quality an important issue that should be considered in fields of m-services, especially by understanding users' needs and adapting to these services (Parasuraman et al., 1988). Service quality evaluation has been the focus of several studies for fields like e-government (Horan et al., 2006). SERVQUAL scale is one of the evaluation systems that was developed by Parasuraman et al. in (1988) and that has been widely used for evaluating customer perceptions of service quality. The scale consists in evaluating services based on 5 dimensions which are: reliability, responsiveness, tangibles, empathy and assurance (Parasuraman et al., 1988). However, only 3 dimensions are useful when evaluating e-government services which are: reliability, empathy and responsiveness (Al-Hujran et al., 2013). Responsiveness dimension refers to user perception of service provider and how responsive and helpful he is. Reliability dimension refers to the degree of accuracy and dependability of the provided service. Finally, empathy corresponds to the interest and concern shown by the service provider towards his customers. Therefore, services with higher responsiveness, reliability and empathy are likely to affect and increase the usability by citizen and thus in return affecting their satisfaction (Lai & Pires, 2010).

Based on the prior research, referred in Table 6.6, I have formulated the following hypotheses:

Hypothesis 8a: Citizen's satisfaction is positively affected by reliability.

Hypothesis 8b: Citizen's satisfaction is positively affected by responsiveness.

Hypothesis 8c: Citizen's satisfaction is positively affected by empathy.

Hypothesis	The references
Hypothesis 8a: Citizen's satisfaction is positively affected by reliability.	Yaghoubi et al., (2011); Horan et al., (2006); Lai & Pires, (2010); Parasuraman et al., (1988); Al-Hujran et al., (2013).
Hypothesis 8b: Citizen's satisfaction is positively affected by responsiveness.	
Hypothesis 8c: Citizen's satisfaction is positively affected by empathy.	

Table 6.6: The references are in support of Hypothesis $8_{a,b \text{ and } c}$

5.2.7 User's Satisfaction

User's satisfaction was defined as "the degree to which a user is satisfied with her/his overall use of the m-service which is provided by the government".

User's satisfaction has an impact on the success of new technology acceptance. Therefore, it is used as a success dimension (DeLone and McLean, 2004; Seddon and Kiew, 1996; DeLone and McLean, 1992; Seddon, 1997; McKinney et al., 2002; Rai et al., 2002).

In order to evaluate user's satisfaction construct, there are specific items that are used for measurement, which are success attribution, need fulfillment and overall satisfaction (Oliver, 1997). The success of a system is related to the degree of citizen usage of this system, as well as the degree of satisfaction that the citizens' experience from it.

Welch et al. in (2004) believed that user's satisfaction was linked by researchers to citizen perceptions about the convenience of online services (transaction), the reliability of data (transparency) and the expected commitment with e-communication (interactivity).

Two issues were identified by researchers to have an influence on user's satisfaction. They were quality of the system and quality of information (DeLone and McLean,

1992; McKinney et al., 2002; DeLone and McLean, 2004; Seddon and Kiew, 1996; Seddon, 1997; Molla and Licker, 2001). Furthermore, many other studies have high-

lighted that electronic service quality is a significant factor that predicts user's satisfaction (DeLone and McLean, 1992; Cao et al., 2005; DeLone and McLean, 2004; Yang and Fang, 2004).

Based on the prior research, referred in Table 6.7, I have formulated the following hypotheses:

Hypothesis 9: User's satisfaction positively affects his/her actual use of m-government services.

Hypothesis	The references
Hypothesis 9: User's satisfaction positively influences his/her actual use of mgovernment services.	Oliver (1997); DeLone and McLean (1992); DeLone and McLean (2004); Cao et al. (2005); Yang and Fang (2004).

Table 6.7: The references supported to Hypothesis 9

5.2.8 Intention to Use

Intention to use) is one of the main constructs of TAM model. It was suggested by Fishbein and Ajzen (1975) that behavioural intention may reflect the degree of difficulty of performing a specific behaviour by individuals. Therefore, the definition of intention to use was extended by many researchers. For instance, (Davis, 1989) has adapted the original definition of this construct by considering the intention to use technology. In another study by Nysveen et al. 2005, intention to use was adapted to consider the case of adoption of mobile services.

Based on the prior research, referred in Table 6.8, I have formulated the following hypotheses:

Hypothesis 10: Actual use of mobile government services is positively affected by citizen's intention to use these services.

Hypothesis	The references

Hypothesis10: Actual use of mobile government services is positively affected by citizen's intention to use these services.	Davis (1989); Nysveen et al. (2005); Dismas and Darlene (2014); Sahari et al. (2012);

Table 6.8: The references are in support of Hypothesis 10

5.3 Summary

This chapter discussed the model used in this study, as well as the constraints considered. The developed model is based on TAM model with the other external factors such as, perceived trustworthiness, perceived service quality, user's satisfaction and perceived mobility.

6 CHAPTER SIX: RESEARCH METHODOLOGY

6.1 Introduction

The developed model for this research, as already identified in Research Model Chapter, is based on the approach known as the Technology Acceptance Model (TAM). In this chapter, I discuss the importance of the research framework in achieving the aims and the objectives of this study. The chapter further discusses the philosophy and methodology underlying the related approaches. The chapter also justifies the methodology chosen for this study, which has employed both qualitative and quantitative approaches. The data has been collected from focus groups, interviews and surveys. I also present here my sampling techniques and pilot study run before the main survey.

6.2 The Theoretical Model

The studies conducted on technology adoption and acceptance have yielded various conceptual models that provide an explanation for the individual's use of technology (Alawdhi and Moors, 2008). The Conceptual models provided insights into the challenge investigated and correlations between variables and concepts. According to Sekaran (1992), "it is how one theorises the relationships among the several factors that have been identified as important to the problem. This theory flows logically from the documentation of previous research in the problem area. Integrating one's logical beliefs with published reasons is pivotal in developing a scientific basis for investigating the research problem".

This study employed a theoretical model in an attempt to achieve the research objectives with regards to the identifying the factors that determine a potential user's intention to use the offered m-government service. The model provided the guideline for formulating hypotheses, testing and comparing the results and helping in analysis and discussion of the findings. The conceptual model, the research objectives and aims played a key role in the identification of the most appropriate research designed employed in the study as well as its justification as discussed below.

6.3 Understanding Methodology

Methodology refers to the procedures and principles of investigation that consists of the process of conducting the research, including the theoretical underpinnings, data collection and data analysis (Collis & Hussey, 2003). It is defined as a set of techniques employed to answer questions of when, how, why and what (Collis & Hussey, 2003). Nevertheless, in the social research context, methodology is not an obvious arrangement of principles and strategies forming fixed rules and slick pattern to be adhered to in a certain order (Gill & Johnson, 1997). Instead, the methodology is regarded to be a process that entails the interaction between a particular study's framework, including the framework's question as well as data collection and analysis. Therefore, the interaction is aimed at answering the research questions as well as facilitating the attainment of the research's main objectives and aims.

The technique is regarded to be a complete process that comprises of research essential components. Such elements are correlated with the research philosophy and framework, research evaluation procedures and the justification for such procedures. Jayaratna (1997) defined methodology as "An explicit way of structuring one's thinking and actions. Methodologies contain model(s) and reflect particular perspectives of reality based on a set of philosophical paradigms. A methodology should tell you what steps to take and how to perform those steps but most importantly the reasons why those steps should be taken, in that particular order". To this, Myer (1997) suggested that it is important for the researcher to understand all the assumptions underlying the research questions in order to adopt the most appropriate methodology for a given project.

6.4 Philosophical Assumptions

The four major philosophical assumptions underlying different research designs used in social sciences have been identified by Burrell and Morgan (1979). Such presumptions relate to methodology, human nature, epistemology and ontology. Subjects are investigated through both implicit and explicit assumptions regarding the world's nature and how to investigate it. The assumption related to ontology is often concerned with the perception of the social reality as having the external reality. It also has an objective nature that investigates whether the social world is internally constructed.

The other assumption is of epistemological nature. This assumption is concerned with the foundation of knowledge and how to obtain the knowledge. It refers to the truth and falsity in knowledge. This assumption is grounded on the knowledge's nature: whether

it can be conveyed in a tangible form and hence “hard”; or whether it is subjective and grounded on one’s insights and experience.

The third assumption relates to the human nature as well as the interaction of human beings with the environment. Burrell and Morgan (1979) suggested two distinct views that existed about such assumptions. One of the views entails the reaction of people to different circumstances in a mechanistic and deterministic manner. Thus, perception portrays people as well as their corresponding situations as the environment’s products. However, the other perspective assumes that human beings are often creative beings. The perception regards them as experts, controllers and makers of their surroundings. All the three presumptions directly affect the fourth assumption. This fourth assumption is methodological in nature and it is concerned with the kind of approach taken by the researcher to obtain specific knowledge.

According to Easterby-Smith et al (1991) mentioned that the knowledge theory or what is otherwise referred to as epistemology adopted by the researcher generally describes and differentiates the study in the field of social sciences. Knowledge theory in this case can be understood in terms of the beliefs that the researcher has in relation to knowledge construction. It was found in the definition of the link between the phenomenon being studied and the research (Al-adaileh, 2003). There has been an ongoing debate between philosophers regarding the best way to conduct a research. Core to this debate is the comparative significance of two primarily distinct models, the positivist model and interpretive model (Amaratunga, 2002). It is believed that the two research models may be contradictory and can be used in combination to one single study (Myers, 1997).

6.5 Positivism versus Interpretivism

The positivism school of thought promotes the use of methods of natural sciences in studying a given social phenomenon (Byaman, 2001). This notion is based on the belief that elements of external social environment should be measured objectively as opposed to being inferred instinctively via intuitions and impressions (Easterby-Smith et al. 2002). Supporters of this model employ experimental and quantitative methods to validate or falsify a given hypothesis in order to make generalisations through the deduction process. One of the major assumptions in this model is that the observer has independence over what he or she is observing. The main aim of the model is to define any causal link between the study variables (Saunders, Lewis & Thornhill, 1997).

Interpretive school of thought is based on how different individuals experience a given social phenomenon in their environment. The approach defines subjective elements of human's activities by emphasizing on the meanings attached to a collective phenomenon as opposed to just taking measurements of the phenomenon in question (Saunders, Thornhill & Lewis, 2009). In this context, this approach employs qualitative techniques in order to get a good understanding of human experience given a specific setting through an induction process. The main aim in this approach is to define and explain a social phenomenon as opposed to investigating relationships between external causes (Remenyi et al. 1998; Easterby-Smith et al. 1991). Supporters of this school of thought generally try to reduce the space between research object and researcher's in a bid to allow for a good understanding of the social environment. This model allows researchers to tackle changes which may take place in the course of the research process. Despite this, collection and analysis of data under this school of thought can be time-consuming and interpretations are hard to make, requiring the researcher to embrace uncertainty. In this context, clear patterns may not be identified as the research process comes to an end (Saunders, Thornhill & Lewis, 2009).

6.6 Research Strategy

A research strategy has been defined as a general direction assumed when conducting a social research (Bryman, 2001). The most suitable strategy for successful achievement of the research aims and objectives is a triangulation or the combination of one or more approaches. In this case, the best strategy would be to combine both positivism and interpretive models, encompassing both qualitative and quantitative research. Triangulation or mixed methods research is suitable here because it enhances confidence in the findings. According to Sekaran (1992), every data collection method is characterized by some form of biasness and this makes triangulation or the used of mixed methods and multiple sources vital for adding rigor to the research. The combination of positivism and interpretive approach coupled with their individual differences give confidence to the researcher to apply both strategies in an effort to ensure successful achievement of the research aims and objectives. The following subsections give a good insight into qualitative and quantitative research methods and the advantages of using a mixed research method.

6.6.1 Quantitative and Qualitative Research

Researchers have found these two kinds of research to be different from each other (Alawdhi and Moors, 2008). Quantitative research focuses on measuring or counting. The common purpose of quantitative research is to clarify, foresee and investigate relationships and to examine possible impact and impacts on assigned results (Bryman, 2001). Qualitative research focuses on the nature of a person's capability after going through some provided phenomenon which are difficult to convey as part of quantitative research. Therefore, it utilises words more than numbers as a part of data gathering (Strauss & Corbin, 1990).

As indicated by Bryman (2001), the quantitative research covers the daily practices of a normal systematic scientific model. Qualitative research uses a little case for representation which encounters using thick rich portrayals of detailed information in endeavours to comprehend and translate human viewpoint. Qualitative ways grant the researcher permission to study issues in depth and as authentic as possible without misreading by pre arranged classifications (Patton, 1984). Quantitative forms use identical apparatuses so that the feedback focuses on specific categories only. The quantitative approach is able to allow statistical handling of data by assessing the reaction of multiple subjects to a small number of questions (Patton, 1984).

Since quantitative data is retrieved from different forms of consistent research, it is made easier to tend to the difficulties of the world from a mathematical point of view. Quantitative research utilises large samples in analysing statistical data. This is done by looking at or finding connection among test properties so that the findings can be summed up to the populace. Such data are more constrained and therefore computerised treatment and statistical analysis is a more preferable approach at this. Qualitative data, however paints a clear picture of situations, people, events, interactions, behaviour, attitudes and concepts.

Researchers have had constant arguments on the difference between quantitative and qualitative research (Trochim, 2006; Tashakkori & Teddlie, 2003; Hoepfl, 1997). Trochim (2006) believes that qualitative and quantitative discussion will always coexist because both approaches are serving different purposes in given cases or situations. Trochim and Patton (1984) mentioned that "qualitative and quantitative data are intimately related to each other and both are recognised as legitimate". The authors hardly see the possibility of using one without the other. They both have to co-exist.

Although both of these methods have the cases that work better with them specifically, it is even better to combine these methods and this is termed as “mixed methods”.

6.7 Mixed Research Methods

Due to the fact that quantitative methods are effective for giving solution to some questions and qualitative methods are appropriate for others, several researchers believe that both quantitative and qualitative methods can be combined in the same study (Hayati et al. 2006; Myers, 1997; Hoepf, 1997). This technique is called “methodological triangulation”. According to Amaratunga et al. (2002), methodological triangulation is “the combination of methodologies in the study of the same phenomenon”. They add, “The assumption in triangulation is that the effectiveness of triangulation rests on the premise that the weaknesses of one method will be compensated for by the counter-balancing strengths of another”. Moreover, Johnson & Onwuegbuzie (2004) mentions that the objective of mixed method is to ensure that two methods maximises on their strengths and reduces their weakness both in solitary study as well as across studies.

According to Creswell (2003) and Brannen (2005), diverse method design have more uses over triangulation. According to Brannen (2005), it is impossible to create a rounded or unitary reality by only applying data composed through the use of different methods, but there is a variety of probable results that can be achieved through the combination of methods. The mixed methods give the researcher more confidence in the research outcomes (Johnson & Onwuegbuzie, 2004).

Mixed method technique uses strategies of enquiry that comprise gathering data either sequentially or simultaneously with an aim of having a better insight of the research problems. The actual data collection comprises of gathering both textual and numerical information for the final outcomes derived from both quantitative and qualitative data (Creswell, 2003). With regards to the advantages named above, concerning incorporating various types of data, researchers have been urged to come up with methods of enquiry that applies diverse methods (Creswell, 2003) as well as create processes for diverse method study (Tashakkori & Teddlie, 1998).

When following simultaneous techniques approach, quantitative plus qualitative data are combined. The two kinds of data are taken all together and then the information is integrated as part of the interpretation of the overall results.

6.8 Research Design

According to Saunders et al. (2009), research plan can be grouped into explanatory, descriptive or exploratory. Descriptive study focuses to define and understand the nature of a certain phenomenon. Moreover, it looks into providing the investigator a profile of the pertinent characteristics of the problem under research. Sekaran (2003) highlights that descriptive study using statistical and quantitative approaches can further move the exploratory study since quantitative data turns significant to offer descriptive information regarding the problem.

An extension of descriptive study is termed as explanatory or analytical study. Explanatory study focuses the study of problems linking to a phenomenon as a way to clarify the manner things occur. This is performed via measuring causal relations among various variables (Saunders, Lewis & Thornhill, 2009) which can be well-ordered in the study programs.

Exploratory study is carried out when less is known regarding the phenomenon. It is undertaken to comprehend better the state of the difficulty, as limited researches may have carried out in the field (Sekaran, 2003). According to Saunders et al. (2009), it is a valued move toward getting new understanding and evaluating the problem in a new way. This type of study utilises techniques including interviews, case studies and observations in order to obtain both quantitative and qualitative information. It is believed that such information offers a better look into the problem being researched and aids in developing theories (Saunders et al., 2009). It also helps formulating hypothesis however rarely offering comprehensive answers to issues or problems. An exploratory study may also offer direction for future research (Saunders et al., 2009).

6.9 Choice of Methods

A parallel diverse research approach that employs both quantitative and qualitative methods in a single phase was selected for this particular study. The approach is common in mixed methods approach (Saunders et al., 2009) and is adopted in the study in order to show its validity to streamline the findings.

This research combines elements of the three types of research design which are mentioned in the previous subsection. It mainly considers exploratory since it investigates the adoption of m-government services in Saudi Arabia which has not been

previously explored. This research is expected to add to a better understanding of the nature of the adoption of m-government services

The proposed research is also descriptive and uses statistics in describing the aspects of the various samples that are employed in the study. These samples are used in describing dependant and independent variables and in reporting the number of respondents for each response. In addition, the measurement of causal links among the variables, hypothesis testing, data analysis and validation earn the research the right to be described as explanatory study. The following subsections discuss the methods as they are used in this dissertation.

6.9.1 Quantitative Methods

Quantitative methods have been used in this research to achieve objective (identifying the factors that are likely to determine citizens' acceptance of m-government services, using TAM model with additional external factors) discussed in Chapter One by carrying out and analysing questionnaires surveys, as elaborated below.

6.9.1.1 Questionnaire surveys

In this dissertation, questionnaire surveys have been chosen to collect information on topic to be covered in the research model adopted for this study, together with testing the relationship between the models constructs. Most of the studies assessing the recognition of e-government services have involved the use of questionnaire surveys. Among them are, Carter and Belanger (2005, 2004, and 2003), Graafland-Essers and Ettedgui (2003), Charbaji and Mikdashi (2003), West (2004), Reddick (2005), Phang et al. (2005) and Akman et al. (2005). In addition, Suanders, Lewis and Thorn Hil (2009) and Schutt (2001) claim that survey study through a questionnaire is usually the way present for creating a representative image of the attitudes and features of a huge populace. According to Schutt (2001), a survey is a method where the study involves gathering of the required information from people through using questionnaires. As shown by Saunders, Lewis and Thornhill (2009), questionnaire, being a common method, is mostly utilised to identify individuals' attitudes. A survey is a proper technique for methodically collecting information from a diverse range of people with different social backgrounds (Schutt, 2001). This method is likely to gather data from several individuals relatively quickly and at a moderate expense. In addition, the survey

technique permits the investigator to generalise the results from an example sample to the bigger populace. Plus, according to the statement above, it is the only existing way to create an illustrative image that could show different outlooks of the characters for implementation of m-government services.

6.9.2 Qualitative Methods

This approach is mainly emphasis on the collection and analysis of words, voices, videos, actions, reactions and statements, or non-digit data. According to Lancaster, (2005) the base of this method is due to its open-ended and it distinctive nature, which allows an individual to express his/her self in a unique way. It could also be described as, this approach helps to figure and develop better understanding of the interpretations, knowledge and observation of individual or groups that may affect to engage in certain behavior within the natural context in which it occurs.

This method of research is applied to a small number of participants, individuals or groups, but it makes available the overall understanding of the issues through a combination of the different procedures and methods to obtain information such as indetailed interviews and focus group discussions. According to Patton (2002), the qualitative approach usually has the following characteristics. It is related with the understanding the unleased realities if the society or the realities which are considered the mysteries of the society. It assumes the different realities and endless possibilities of a happening. It presents the data in amusing verbal explanation. It helps the researcher to be absorbed and to collect the data directly during data collection. It enables data collection in a batter and collaborative way. It helps to collect data in a flexible and tentative way, to make this approach more dynamic. This approach emphasis the general or overall perspective, which concentrate on the complexity and the dynamics of interrelationships of the under-discussion matter. It discloses those realities which are considered invisible in daily affairs and makes these issues more familiar to the public at large. It draws conclusions from the view point of the participants or respondents of the interviews. It discovers and focus on the open questions relatively hypotheses testing. In qualitative approach, mostly purposive sampling is used. Qualitative research is also used to unleash the thoughts or mysteries which are considered strange and it helps a research to think deeply into the problem which is under observation. Qualitative data collection methods consist of organized and semi controlled techniques. The most

or frequently adopted methods which are used in the qualitative method are focus group discussion, individual interviews and direct observation of the participant.

This approach has been used in many disciplines and in many ways as like most of the researchers prefer qualitative approach in place of quantitative approach specifically in the field of consumer behavior in the last decade (Catterall, 1998; Goulding, 1999). Conventionally it is considered that research on human behavior is a quantitative and statistical in nature, basically based on the survey method to collect data. This can explain the reasons and difficulties which a researcher face during the study or during data collection about consumer behavior and that would lead to acceptance and thus the success of the new services provided (Zaltman, 1997). Though, the qualitative approach is supposed to overcome many of these problems by building and understanding of the researcher on the opinions, involvements and practices of consumers to engage in certain behavior. The qualitative research consists of field research where a researcher analyzes the data or respondent's views qualitatively. This method of research comprised of data collection, keen observation, interaction with the people who are being interviewed in natural setting. Qualitative research is used to capture communicative information carried in quantitative data about inspiration, opinions, ethics, feelings and underlined behaviors.

Except this, although, lots of IS researchers are familiar about the importance and authenticity of the use of qualitative approach in their research (Orlikowski, 1993; Kaplan and Maxwell, 1994; Kelder and Turner 2007; Jabar et al, 2009). Furthermore, there are many forums as like IS world Net website, which provides the opportunity and a good help regarding IS researchers, weather beginner or experienced in this approach (Myers, 1997). This method of research has become a necessary tool for the IS researchers, also for the independent data analysis or complementary approach to traditional quantitative approaches (Lacity and Janson, 1994).

Even if a quantitative method offers an enlightening attention on citizens' attitudes towards the services of m-government, it was desirable to get more insight on the issues involved. I used qualitative methods to achieve objectives 1 and 3 (stated in section 1.5). The qualitative methods applied in this study are interviews, open-ended questions and focus groups as discussed below.

6.9.2.1 Focus groups

This method is considered effective in offering more explanation and information on issues concerning the implementation of e-government services (Alawdhi and Moors, 2008). This techniques has been selected to assist in expounding the finding of the surveys, particularly the unexpected outcomes and to find out hidden meaning as noted by Schutt (2001) and Bernard (2000). Focus groups method consists of a small group conversation (normally made up of 6 to 12 participants) controlled by a catalyst that has a well understanding of participants as well as attitude applicable to a given study (Gorman and Calyton, 1997). This technique tries to collect information concerning the opinions and feelings of a group of individuals with a certain experience and assesses how they come up with the feelings (Bryman & Bell, 2003; Bernard, 2000; Collis & Hussey, 2003). A facilitator or a moderator is used to manage the participants who also simulate them to discuss their response, feelings and opinions on the said topic. The observers are urged to come up with their own ideas as they pay attention to the views of the other participants of the group (Collis & Hussey, 2003). According to Morgan (1998), it was mentioned that the open use of the group communication offers information and insights that are less available without any group interactions existing, providing the researcher with a lot of the information.

6.9.2.2 Interviews

In this study, the researcher had several interviews with the main officials of the mgovernment program in Saudi Arabia. The interviews were conducted to develop the little amount of literature about the m-government in Saudi Arabia. It was also conducted to discuss the upcoming developments that are achieved in m-government services from Saudi Arabia.

Clarke and Dawson (1999) defined an interview as a “purposed conversation”. They are believed to be essential in investigating the on-goings and coming up with new understandings (Saunders, Lewis & Thornhill, 2009). This kind of method (interviews) is a suitable method for exploratory research, such as this study, to obtain information and a full understanding of the nature of the programme's context (m-government program), its principal objectives and the theory behind its design and implementation, especially during the early stages of a study. Furthermore, the dialogue has some benefits which include prompt and efficient statistics gathering. Nevertheless, the method includes some drawbacks for instance, the cross-examiner’s impact on the

applicant and high cost in terms of both the participant's and the researcher's time. Here, the decision was made to use the interviewing method in conjunction with others.

6.9.2.3 Open-ended questions

In this study, open-ended questions were also used. Collis and Hussey (2003) stated that open-ended questions are provided at the end of questionnaires and that is an effective mechanism to allow the participants to express their opinions and views in their own words. Collis & Hussey (2003) and Easterby-Smith et al. (2002) stated that there are some advantages of using open-ended questions since it allows the researcher to ask probing questions and obtaining unanticipated perspectives about a specific phenomenon.

6.9.2.4 Data Analysis Process

The process starts with open coding, where the researcher investigated the data in all possible way, scanning the text line-by-line and trying to identify substantial codes with his own opinion, with this aim that to construct categories and their properties from a careful analysis of the data which is under investigation or observation. Primarily, the codes were converted into grouped components which were subdivided into sub categories and sub-sub categories. To refine the emerging categories which were most closely to the related phenomenon or the problem which is under observation, there the process of open coding had to be delimited. The careful coding required the researcher to encode the event or happenings which are related to the problems which are in discussion or the categories which are being observed (Glaser, 1978).

- Transcription or Translation

In this step, the for the sake of analysis proceedings and to encode the collected data, researcher converted all the audio taped interviews into the Arabic in the form of different documents. After this all the Arabic version of the data was translated into English version. During this process, a great difficulty was observed, in the phase of translating some Arabic quotations and verdicts into English language. Although some of the translated data were not simple enough, but it comprised of the sufficient information to construct a theory. This process was tiresome practice and took longer time as compared to the expected time limit. In addition, the researcher was interested to comply with the university research policy and research ethics but during data storage and data collection it was ensured to make this process confidential in nature.

- Open Coding

This process of coding was started from the analysis of the interviews and focus groups which were recorded during data collection, for this purpose of analysis researcher encoded the recorded interviews and focus groups. Charmaz (2006) narrates that the openness in the primary coding leads a researcher towards the exploration of new ideas and to build a new construct to emerge in the society. For this purpose, all the interviews were analyzed and coded after hearing and reading the interviews word by word and line by line. According to Charmaz (2006) this segment of the analysis was called the incidents or the nodes of the theory. These nodes or incidents could be derived from the phrase, sentence, other collected data, but these nodes are regular in nature because it was not in paragraph. These nodes and incidents are compared with other nodes to make the coding process more helpful and more continual. This practice helped the researcher to reach towards the action verbs of the collected segments of the data, and then allot codes to these action verbs which leads towards the theory.

- Selective Coding

After open coding, the researcher thought more deeply or dug out the coded roots more deeply to analyze the data. As discussed earlier about open coding, after open coding the researcher identify the largest connotated nodes or incidents in a single code or node according to properties or categories associated with the problem or phenomenon which is being observed, to keep the analysis more open initially the data was collected more

openly, especially during recording of interviews which make it possible and easy to reach towards a theory. Additionally, open coding leads towards the exploration of relevant data about the observed phenomenon or the problem which is under observation, regardless of the depth of the relevance. Whereas, selective coding leads towards in more depth and in the extensive dig out about the phenomenon on the basis of the initial codes or incidents, concepts, properties and categories which are believed the most important factor of the study.

6.9.3 The Methods Design.

This part describes the design of methods which are used in the study and also the way employed to the collected data.

6.9.3.1 Survey design and procedures.

Figure 6.1 summarises the steps which were used to design this research's instrument and the subsections below elaborate it.

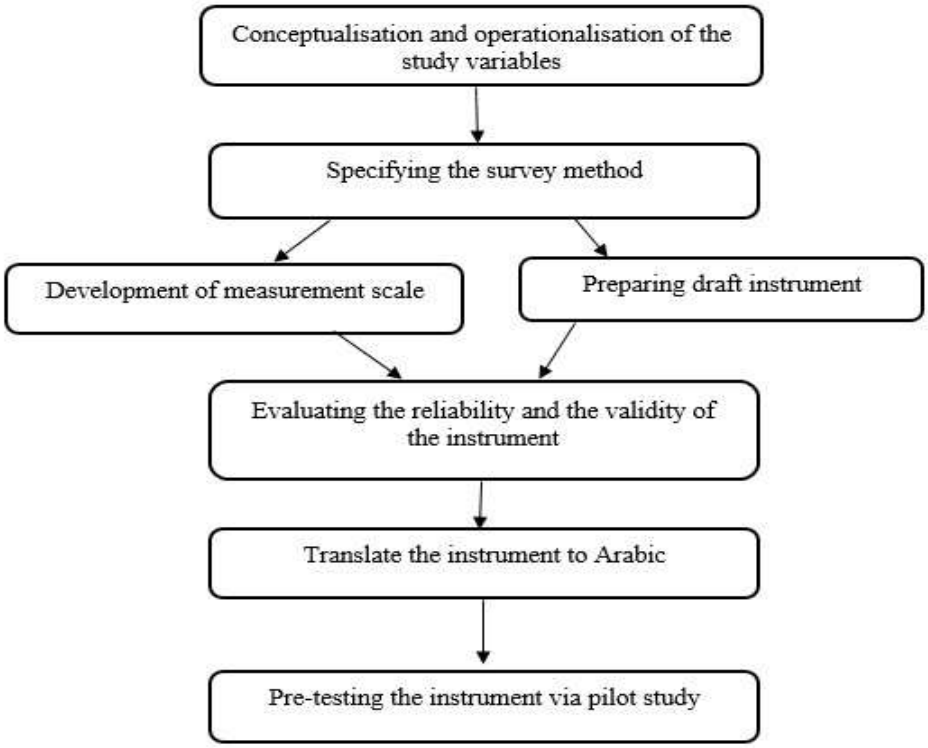

Figure 5.1: The steps to design and probe the research instruments.

6.9.3.1.1 Conceptualisation and operationalisation of the study variables.

Conceptualisation is the process of taking an idea and advancing it through providing a definition about its concept or the theory behind it (Neuman, 2003). The process of explaining how to measure an implemented idea is known as an operationalisation (Straub et al., 2005).

In this research, the literature identified with every variable served directly in the improvement of the measures. From the earlier research, hypothetical constructs are operationalised by utilising it successfully in the past items. By utilising items adopted from Davis and Davis et al in 1989, the TAM scales of perceived usefulness (PU) and perceived ease of use (PEOU) are used. From Tood and Taylor (1995), the TAM scales of attitude towards to use (ATU) and intention to use (IU) are adopted. The scales of perceived mobility are measured by using items adopted from Hong et al. (2008). However, the scale of the perceived service quality was measured by using items from Al Hujran and Aloudat (2013). The measurement of trustworthiness was taken from Colesca (2009) and Belaner and Carter (2005). All items were measured utilising a five-point Likert-sort scale which had options ranging from "strongly agree" to "strongly disagree."

6.9.3.1.2 Specifying the survey method

Indicating the survey strategy is a vital step in the instrument design (Alhujran, 2009). The specified information to be gathered is determined by the researcher. Data can be accumulated by various survey strategies: (1) by personally directed surveys i.e. phone or face to face, (2) through the mail survey and (3) a web survey (Sekaran, 2003; Fink, 2006). In this research, I used personally directed survey (face to face) to distribute the questionnaires to the participants.

6.9.3.1.3 Development of the measurement scale

Measurement can be defined as is an operation carried out to determine the amount of variable that an object possesses (Churchill, 1979). Five point (shown on Figure 5.2) Likert scales were utilised in the majority of the scales. The choice to utilise this scale was made after considering the fact that such a scale can conveniently show the responses from strongly positive to strongly negative; with the midpoint indicating a neutral response. Likert scales are used as interim scales. These scales are the primarily utilised scales as a part of data frameworks research (Sekaran, 2003) in information

systems research. Five-point Likert scale was utilised as a part of past TAM related examination (Teo et al., 1999; Igbaria et al., 1995; Shih, 2004; Pikkarainen et al., 2004).

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5

Figure 5.2: The 5-point Likert scale.

6.9.3.1.4 Preparing draft instrument

It starts with explaining the motivation behind the study. In the accompanying letter, the confidentiality was promised. The objectives of the study, the communication method to be used and the approximate length of the instrument were listed. The researcher's name, the supervisor's name and the university were listed as well. Table 5.1 demonstrates the scales in the draft instrument. As the Chapter Six elaborates, there were 11 constructs and an aggregate of 43 items to quantify them. A short questionnaire was designed for participants to fill. Below is a detailed discussion of the structure of a questionnaire.

- Introduction

At the start of the questionnaire was an introductory paragraph for the participants to read. It contained background study information, research objectives, privacy instruction along with the contact and identity information of the researcher (Sekaran, 2003, p.245).

- Part one: Overall information

This section entailed inquiries which collected respondent's data. The questions were linked to the age, gender, department and college of the participants. More questions were there to find out if mobile involvement had any role in mobile government services adoption. Participants were also required to show how much time they have spent using mobile plus for what purposes they using the mobile.

- Part two: Mobile government services

It was important to explore the perceptions and attitudes of participants about mobile government services. It began with a description of m-government and what comprised the m-government. Participants were questioned whether they had utilised any m-government services since the mobile government was hardly utilised or broadly known

by citizens in Saudi Arabia. Then participants were asked to show their insight of the revised TAM model with the other factors such as perceived trustworthiness, perceived service quality, user's satisfaction and perceived mobility to utilise mgovernment facilities, all produced by utilising the 5-point Likert scale (1=strongly disagree to 5=strongly agree).

Constructs	**code**	**Statements**
Perceived Usefulness	PU1	"Using the mobile government services would be useful in my daily life"
	PU2	"Using the mobile government services would help me accomplish things more quickly"
	PU3	"Using the mobile government services would increase my productivity"
	PU4	"Using the mobile government services would help me perform many things more conveniently"
Perceived Ease of Use	PEU1	"I expect that learning how to use the mobile government Services would be easy for me"
	PEU2	"I expect that my interaction with the mobile government services would be clear and understandable"
	PEU3	"I would find mobile government services to be easy to use"
	PEU4	"I expect that it would be easy for me to become skilful at using the mobile government services"
Perceived Mobility	PM1	"I expect that I would be able to use mobile government services at anytime, and anywhere"
	PM2	"I would find Mobile government Services to be easily accessible and portable"
	PM3	"I expect that mobile government services would be available for use whenever I need it"
	PM4	"In general, I expect that I would have control over using

		mobile government services anytime and anywhere"
Responsiveness	RES1	"I believe that any mobile government services provider is never too busy to respond to citizen requests"

	RES2	"I believe that mobile government services providers give a prompt service"
	RES3	"There is a good respond from any mobile government services provider"
Reliability	REL1	"Mobile government services provider shows a sincere interest in solving some citizen problems"
	REL1	"Mobile government services provider provides easy to use tools for checking on the status of an ordered service"
	REL1	"Transactions with mobile government services provider are error-free"
	REL1	"Mobile government services provider delivers on its undertaking to do certain things by a certain time"
Empathy	EMP1	"Mobile government servicesprovider offers a helpful assistance through SMS"
	EMP1	"Using mobile government services allows citizens to easily exchange ideas and opinions"
	EMP1	"Mobile government services provider has operating hours convenient to all its citizens"
	EMP1	"Mobile government services provider understand my specific needs"
Satisfaction	SAT1	"I am satisfied with the technical quality of mobile government services"
	SAT1	"I am satisfied with the information I receive from mobile government services"
	SAT1	"I am satisfied with the way in which mobile government providers adjust to my needs"
	SAT1	"Overall, I am satisfied with the services offered by mobile government providers"
Perceived	PT1	"I expect that mobile government services will not take advantage of me"
	PT1	"I believe that mobile government services are trustworthy"

Trustworthiness	PT1	"I believe that mobile government services will not act in a way that harms me"
	PT1	"I trust mobile government services"
Attitude towards using mobile government	ATT1	"Using mobile government services is a good idea"
	ATT1	"Using mobile government services is wise"
	ATT1	"Using mobile government services is beneficial"
	ATT1	"Using mobile government services is interesting"
Intention to use mobile government services	INT1	"Given the opportunity, I will use mobile government services"
	INT1	"I am likely to use mobile government services in the near future"
	INT1	"I am willing to use mobile government services in the near future"
	INT1	"I intend to use mobile government services when the opportunity arises"
Actual use of mobile government services	ACT1	"If m-government was implemented I would use it as a primary mean of transacting with the government "
	ACT1	"I would use m-government as an alternative to traditional ways of transacting with the government"
	ACT1	"I will use m-government services as soon as I can do so"
	ACT1	"Overall, I would use m-government services in Saudi if they were available"

Table 5.1: The items of the questionnaire (elaborated in Chapter 6).

6.9.3.1.5 Evaluating the reliability and the validity of the instrument

According to Straub (1989), in confirmatory empirical research, instrument validation is a crucial and earlier process. The dependability of a measure alludes to the extent to which the instrument is free of arbitrary error. According to Sekaran (2003), it is mainly concerned with the consistency of the measurement. In this research, detailed items analyses and reliability were used to clean up the measures of each construct. The measurement items were surveyed and, if appeared to diminish the dependability of

the instrument, they were expelled. The internal consistency of a set of measurement items alludes to the degree to which the gathering of items is homogeneous. Cronbach's alphas are normally used to assess the inside consistency (Cronbach's, 1951; Nunnally, 1978; Sellitz et al, 1976). In the pilot study of this research, a reliability (Cronbach's alphas) test was conducted to assess the internal consistency of the measurement. In accordance with this study, the SPSS 23 was utilised to test internal consistency for the items of every construct's metric in the review.

The next step involves accessing the instruments validity that is used to carry out this task. In this particular stage, the basic types of validity investigated are face validity, convergent and discriminant validity. Content validity specialists in the research institutes are recommended to be approached to offer guidance on whether scale items have face validity (Straub et al., 2005). In this manner, the instrument was pre-tried with three scholar (lecturers) in the field of Information Systems (IS) at King Saud University and three students who were in the field of IS at Strathclyde University. All those students were asked to finish the questionnaire. When they completed it, they were asked if they found any issues with comprehending the study questions. Based on their feedback, the wording of questions was revised and all these changes are in Arabic version.

6.9.3.1.6 Instrument translation

Given that most of the Saudi Arabian are conveying in Arabic Language, questionnaire items of the pilot study and the main study has been translated into Arabic Language. The English version of the questionnaire has been translated into Arabic by two autonomous interpreters. The Arabic version which has been translated by the principal interpreter has been interpreted back in English by the second interpreter. The same was rehashed to the second interpreter's rendition. The two forms in both languages have been contrasted with intention any distinctions. The last form has been utilised as a part of the pilot study.

6.9.3.2 Pre-testing the instrument via pilot survey testing

A pilot study is utilised as a major aspect of the scale advancement strategy by bearing in mind that the end goal to finish the 'experimenting with' or pre-testing of a specific

exploration instrument (Baker, 1994). As indicated by Teijlingen and Hundley (2001), the fundamental favourable circumstances of leading a pilot study are the following:

- The pilot study may give advance cautioning to the ranges where the exploration undertaking could fizzle.
- It demonstrates whether the proposed instruments and techniques are so complicated or unsuitable.

In this research, using a pilot study was valuable in terms of increasing the accuracy of the results through accomplishing the above points.

6.9.3.2.1 Pilot study sample

There is no regular assertion about the specimen size for the pilot review. Hunt et al. (1982) suggested a specimen size somewhere around 12 and 30. On the other hand, the larger sample size, the more accurate the outcome are (Emory and Cooper, 1991). For this pilot study, I identified the students, academic and administrative staff who were Saudi Arabian citizens as our population and were from King Saud University. An overview was completed on a sample of 33 participants at King Saud University.

6.9.3.2.2 Demographic analyses for the pilot study

Of the reviews broke down, as Table 5.2 appears, 12 respondents (40%) were female and 18 (60%) were male. A large portion of the respondents had significant involvement in utilising a mobile. The largest numbers of respondents were from Pharmacy and Science and were 12 in number (6 persons per each college). In addition, most of the respondents had degree (secondary). Finally, the leading purposes for uses of mobile phones showed, information search, government services, entertainment, mail, communication and shopping

Descriptive	**Answers**	**Frequency**	**Percentage**
Gender	MALE	18	60.0
	FEMAL	12	40.0
	Total	**30**	**100**
Age	18-20	11	36.7

	27-30	3	10.0
	21-23	6	20.0
	31-35	3	10.0
	24-26	2	6.7
	36 and above	5	16.7
	Total	**30**	**100**
	College of Science	6	20.0
	College of law	2	6.7
	College of Pharmacy	6	20.0
	College of Engineering	1	3.3
	College of Dentistry	1	3.3
	College of Medicines	4	13.3
	College of Computer Science	2	6.7
	College of Applied Health Sciences	3	10.0
	College of Education	2	6.7
	College of Business Administration	3	10.0
	Total	**30**	**100**
What is your highest level of education?	Undergraduate	5	16.7
	Primary	18	60.0
	Post-graduate degree	7	23.3
	Total	**30**	**100**
What is your occupation?	Student	19	63.3
	Administrative Staff	5	16.7
	Academic Staff	6	20.0
	Total	**30**	**100**
How often do you use	Daily	27	90.0
	Two or three times a week	2	6.7

mobile?	Two or three times a month	1	3.3
	Total	**30**	**100**
For what purposes do you use the mobile?	Shopping online, Communication, Government services, Entertainment	5	16.7
	Communication, Government services, Email,Information search	1	3.3
	Communication, Government service, Entertainment	4	13.3
	Communication, Entertainment	4	13.3
	Shopping online, Communication, Government service, Email, Entertainment	2	6.7
	Communication, EmailEntertainment	1	3.3
	Shopping online, Communication, Government service, EmailEntertainment, Information search	11	36.7
	Communication	1	3.3
	Shopping online, Communication, Government service, Entertainment, Information search	1	3.3
Have you ever used any Saudi mobile government service	**Total**	**30**	**100**
	YES	30	100
	NO	-	-
	Total	**30**	**100**

Table 5.2: General Information of the pilot study

6.9.3.2.3 Instrument reliability of the pilot study.

The reliability of a measure refers to the extent to which the instrument is free of irregular mistakes. It is concerned with the consistency of the measurement (Sekaran, 2003). In this pilot study, the reliability was utilised to finalize the measures of each factor. The items of the measurement were evaluated and, if appeared to diminish the unwavering quality of the instrument, were removed. I used Cronbach's alpha test to determine the dependability of research instruments (Cranach, 1970). According to Table 5.3, all the values are in acceptable level of .7 (Cranach, 1970).

Constructs		**Number of items**	**Cronbach's Alpha (α)**
Perceived usefulness		4	.852
Perceived ease of use		4	.904
Perceived mobility		4	.892
Perceived Services quality	Perceived responsiveness	3	.944
	Perceived reliability	4	
	Perceived empathy	4	
Satisfaction		4	.918
Perceived trustworthiness		4	.911
Attitude towards use of mobile government services		4	.816
Actual use of mobile government services		4	.775
Intention to use mobile government services		4	.919
The overall of reliability coefficient		43	0.88

Table 5.3: The reliability of the pilot study.

6.9.4 The Design of the Focus Group.

With reference to Battleson, Booth and Weintrop (2001) and Clark (2004), focus groups are vital in conducting studies as they enable the collection of more detailed information. Focus groups offer clarity on the information collected about the experience with

respondents (Krug, 2005). The research was aimed at gaining important information on the services of m-government and the many issues that emanate from this service, the questions used in this study are in Appendix (10).

6.9.4.1 Preparing for focus groups.

The directives and queries relating to focus groups that were originally in English were translated to Arabic. The questionnaire method was used because it was an appropriate channel to advertise the focus groups. In the instruction section, there was a description of the expectations of the researcher. The students who were willing to respond to the questions were required to input their names and email addresses so that they could be contacted in the future to discuss their experiences in participating in such sessions. This information on participants allowed the organization to make more efficient plans in the future on how to maximise the benefits of using questionnaires in gathering information. In total, fifty-two (52) respondents willingly took part in the exercise and gave their contact details. After that, 43 of them gave their email addresses and were willing to answer follow up questions and participate in such exercises in the future. Unfortunately, twenty (20) gave their mobile phone contacts. The computer labs were used for the arrangements. The lab activities were set up in King Saud University and Imam Mohammed Bin Saud University campuses. Emails and text messages were sent to the respondents and they were asked to confirm their participation. Those willing to participate were informed of the times when the sessions would take place. After that, five (5) students came to that session in King Saud University and seven (7) students came to that session in Mohammed Bin Saud University, as explained in Qualitative Analysis chapter further below.

6.9.5 The Design of the Interviews.

I arranged several interviews with main officials of the m-government program in Saudi Arabia with an aim to develop the little amount of literature about the mgovernment in Saudi Arabia. This was also done as I wanted to discuss the upcoming developments achieved in m-government services from Saudi Arabia. According to Clarke and Dawson (1999), an interview is a “purposed conversation”. They are possibly essential in investigating the “on-goings” and coming up with new “understandings" (Saunders, Lewis & Thornhill 2009, p. 212). The questions used are listed in Appendix (9).

6.9.6 The Design of the Open Ended Question.

In this study, open-ended questions were also used in surveys (the questionnaire). As advised by Collis and Hussey (2003), open-ended questions are provided at the end of the questionnaires and are used to allow participants to express their opinions and views in their own words. A single question was asked: "In your opinion, what are the other factors which influence the adoption of mobile government in Saudi Arabia?"

6.10 The sample of this study

This study was used with the seven stages procedure for sampling as developed by Zikmund (2003). The procedure is as follows.

Stage	Process	Selection of this research
1	Defining target population	Saudi citizens who are adult and living in Riyadh.
2	Select a population frame	All the students and academic staff and administrative staff in all the universities which are in Riyadh and owned by HE.
3	Determine sampling design	Probability/stratified random sampling
4	Plan for select sampling units	Plan for sample size selection, accuracy, time resources and right analysis
5	Determine sample size	Survey of 800 questionnaires
6	Select sampling units	2 universities
7	Conduct fieldwork	Distributed in two different places

Table 5.4: The seven stages procedure for sampling as developed by Zikmund (2003).

- First stage.

The first stage involves selecting the target population for the study. This research focused on Saudi citizens who lived in the Riyadh region. The respondents were adults.

The city is ideal because 25% of the general Saudi population live in Riyadh.

- Second stage.

This stage involves selecting the population frame for the study. As per the Saudi statistic, 75% of the population is below 38 years. The universities were chosen for this research because:

1) Most of the target population is situated there.

2) Because the young population is responsible for the future and knowing what they think of m-government services is key in estimating the future.

3) University students are more conversant with electronic devices like computers and mobile phones which the m-government services are based on.

4) The students would be accessed in classroom sessions to ensure higher completion rates of the questionnaires used. Babbie (1973) asserts that “it may be appropriate to administer the questionnaire to a group of respondents gathering at the same place at the same time".

5) To diversify the demographics, the staff and other adults in the university would also be used as respondents.

6) The author is familiar with Saudi Universities. Most of those involved in issuing the questionnaires are familiar with the premises in both universities. This will ensure effective distribution and save on time because the researchers are aware of the shortest routes to key buildings and also the places within the universities where they can find students in large numbers.

- Third stage.

The main activity in this stage is determining the design of the sampling. Sampling procedures must be defined at this stage. Two techniques are used: purpose driven sampling technique and probability sampling technique. The probability sampling technique is mainly used in quantitative studies and is often used where there is a large population which must be represented fully by the sample. This is only assured where probability inclusion for all members can be calculated (Teddlie & Tashakkori, 2009). Purpose based sampling is used in quantitative studies where the units are selected as per the purpose of answering the research questions and meet the objectives.

This research is a quantitative study and so it used the probability sampling technique. This sampling technique was further divided into 3 types. First, type is the random sampling technique where each sampling unit in a defined population has equal chances of getting included in the sample (Teddlie & Tashakkori, 2009). Second is the stratified sampling type which involves dividing the target population into groups such that each group has one unit and then the groups are put together and units selected from the summed up groups. Typical groups can be male /female groups. The third type is cluster sampling. In this type, units are considered to be grouped in the population (Teddlie & Tashakkori, 2009). The aim of the research is to choose a sample that fully represents

the entire population. Stratified random sampling was settled upon in this research because:

1) It allows the obtaining of various sub-groups to represent the population. The subgroups may include male or female, age groups and education level groups etc. The sample to be used is broken into these subdivisions as per the procedure outlined above.

2) Stratified random sampling reduces the chances of bias in the process of sampling. This is because it minimises human bias by use of a more defined sample.

3) Stratified random sampling provides a sample that clearly represents the rest of the population than other sampling methods would (Zikmund, 2003).

4) The use of a stratified process in selecting units improves the chances of the sample respondents to be more evenly distributed in the population.

5) The sample in stratified random sampling allow an even representation of the population since the sample is made up of groups coming from different parts of the population.

- Fourth stage.

This stage entails the planning on the choosing of sampling units. To be allowed access into these government owned universities, a formal letters are written seeking the permission to carry out the study. The letters will be written by the supervisor and sent to the presidents of the universities. The presidents will allow the distribution of questionnaires to their students in the classes and academic and administrative staff. The letter is attached in this dissertation in appendix 2.

- Fifth stage.

This research aims at examining the views of the citizens towards adopting mobile government services. The research develops a model based on TAM model to guide the Arabic gulf countries in the making and implementation of m-government services. The developed model will help the proprietors of these services to better their understanding of the factors that people consider during the adoption of these services. This developed model produced will be based on the relationships of the existing concepts. Structural Equation Modelling (SEM) was the method to use to test the model and the reliability of the information was derived from the model. SEM method analysed the confirmatory

factors that will make the measurement model to be considered valid; also, to test the structural model as well.

In evaluating the sample size, all the information related to the size of the sample used in SEM is reviewed. SEM used multiple variables in its analysis and is an integration of several regression models based on the model that has been brought forward and the available hypothesis relationships between existing concepts. SEM analysis is found on procedures which are sensitive to the size of sample used and the height of differences in the data used. According to King (1998), a sample size of less than 100 is not usable while that of 150 people is too small. Consideration of a sample of 200 people or less makes the data unstable and the tests are not conclusive. With reference to Schumacker (2004), agreed sample sizes should be at least 200 people in 500. Samples below 150 are too small for the SEM analysis to be applied. Bentler and Chou (1987) allows at least 5 cases per parameter provided all the terms of errors and coefficients in estimation are met. Surveying 72 SEM analysis studies, the researchers reported that 50% of them had used a sample size of 198 people. According to Loehlin (1992), the sample size should be around 200 people. Hoyle (1995) puts the minimum limit at 150 people. Stevens (1996) recommends that there should be at least 15 cases per any variable used in the test.

Another thumb rule is that the sample size should be at least greater than 8 times the variables used. According to Lomax and Mitchell (1993), there should be 10 to 20 times as many cases as variables.

The accuracy of the data from the research is directly dependent on the size of sample used. With reference to Saunders, Lewis and Thornbill (2009, p. 127), using a large sample eliminates the chances of errors in using the general population. The larger the size of sample, the more precise the findings will be. It was agreed to use a large number of people from the two institutions which are King Saud University and Imam Muhammed Bin Saud University in a bid to produce more precise findings which would be the true reflection of the general population in the universities. Krejcie and Morgan (1999) calculates sample size according to the 95% confidence level and the relative differences in the percentage of marginal error. These figures provide a description of the precision of the findings. The tables give 384 people as the recommended sample size to represent a population of about 250000 at a 5% margin error. The population is rounded off to the nearest 10000 before the sample estimation procedure kicks in. At 3.5% margin error, 782 people should be used in sampling. At 2.5% margin error, the sample should be 1527 people. At 1% margin error, 9248 people should be used in the

sample. It was agreed to use a margin error of 3.5% and include 782 people in the sample. An additional 18 people were included in the sample to account for the respondents who failed to cooperate or were not available during the actual study. A total of 800 people was settled at for use in the research

From the use of this literature and the rules governing SEM, the sample size for this study must be at least 782 respondents. It was decided to take 800 to ensure the results.

- Sixth stage.

This is the second last stage and is involved with the actual determination of the sampling units. The questionnaires will be issued to the respondents in both the universities. The universities contain both male and female students, academic and administrative staff and these universities are owned by H.E in the city of Riyadh. 330 questionnaires were issued to King Saud University while another 470 were issued to Imam Muhammad Bin Saud University.

- Seventh stage.

This is the final stage in the research and involves the actual data collection and fieldwork. Normally the researcher guides the respondents in filling out the questionnaires and elaborating to them the questions that may not be easily understandable. The researchers also use this opportunity to emphasise to the respondents the need to completely fill the questionnaire and the benefits that will be derived from carrying out the research.

6.11 The Questionnaire Distribution.

Once the presidents of the two participating universities had allowed the research to take place on the universities' premises as listed in the appendix (4) and (5), the research began with a collection of data from the statistics unit of these universities on the number of students, academic and administrative staff that were registered in every college. To increase the number of respondents and reduce on time taken by each to answer the questionnaire, it was agreed to proceed by approaching the students in their classrooms. According to Babbie (1973), issuing questionnaires to a number of interviewees gathered at the same venue improves the rate of completion of the questions and saves costs distributing the questionnaires. Computer labs were reserved to be used for focus groups. According to Mangione (1995), there are five grouping rates of questionnaire participant: (1) less than 50% not acceptable, (2) between 50% and 60% barely acceptable, between 60% and 70% acceptable, between 70% and 85% very good and

above 85% excellent. In the examination the responses received, 695 responses were found to be useful (86.8% of total questionnaire) and 105 were discarded because of incomplete questionnaire Therefore, the response rate was 86.8%.

6.12 Structural Equation Modelling (SEM)

Straub *et al.* (2004) holds the view that two separate statistical algorithms are used for development of tools related to SEM: (1) SEM based on covariance, this is used in AMOS and LISERL (2) SEM based on partial- least- squares like shown in PLS graph. SEM which works on principle of covariance has the ability to put forward the total fit of the model as it can produce a group of fit indices, this is not possible in PLS. Also, it has a special feature that it can draw up a contrast between the hypothesized model and the model that has the best possible fit. Hence, according to Gefen *et al.* (2000) analysis of data using covariance is more suitable for confirmatory studies whose goal is to check the validity of a hypothesis. However, SEM based on partial- least- squares (PLS) does not have the ability to produce model fit indices. PLS is able to demonstrate the fit of a model by virtue of laying down significant paths with a high value of R- square (the values of R^2 represents the percentage of variance which provides an explanation of predication of all the independent variables in the result) and it also makes sure that internal consistency is maintained for every single construct implying that the results are trustworthy (Gefen *et al.,* 2000).

As per the recommendations given above, the method chosen for analysis of data in the larger scale quantitative study was Structural Equation Modelling. Many factors were behind this choice. It is quite clear that SEM is the best possible method for this research as it strives to confirm and validate a theory and this study also has similar goals. In addition, the given research model is quite complicated and various causal relationships related to many theories are included in it. The regression analysis model is designed in a manner that a single test is conducted for every single path. This is not an easy to conduct process and errors may be found in the results as the researcher is required to conduct path analysis for every single test manually that makes the results prone to human errors. On the other hand, researchers can conduct a number of path analyses where a single test is conducted at one point of time. In case a model has dependent variables which convert to independent variables later then the best possible method is SEM. Also, it has the property of being able to predict items loading in accordance with

prior explicit determination but statistical techniques of the first generation are unable to incorporate these points.

Lastly, it must be remembered that SEM based on covariance are superior than Partial Least Squares-based (PLS) as PLS is more suitable for laying down a theory and for exploratory research. SEM based on covariance can make the required changes to the presumed model to arrive at the best possible fit and this research has similar goals. A number of software programs like EQS, AMOS AND LISERL are utilized for carrying out SEM methods based on covariance. AMOS 23 is software that is used in combination with SPSS which is popular software.

6.12.1 Assessment of Model Fit

After the SEM requirements have been put in place keeping in mind the abovementioned points then evaluation and testing of the total fit for the measurement and structural models is undertaken. Many different measures have been utilized to check the extent to which the hypothetical model and data are compatible. Depending on their features and the facts given by them in context of the fit indices or measures are classified in categories. According to Hair et al. (2006), every single group of goodness- of- fit measures (GOF) evaluate the model in their individual manner.

Many different measures have been used to evaluate the total fit of the model and these can be grouped in three: absolute fit measure, incremental fit measure, and parsimonious fit measure (Hair et al., 2006). The measures classified as absolute fit draw up a comparison between the estimated covariance matrices described in the hypothetical model and the sample invariance- covariance (Kline, 2005). Chi square (x^2) is the indicator that is the most common and most significant representative of absolute fit, if the associated p value is not significant then x^2 is indicative of a good fit model (Gefen *et al.*,2000). The model is taken to be well compatible with observations if the difference among the predicted covariance matrix and sample covariance matrix are not significant. But, studies postulate that when the sample size is large and the model is complicated chi square test is more sensitive (Hair *et al.*, 2006, Gefen *et al.*, 2000). To decrease the impact of the size of the sample, normed x^2 is used as an extra measure, this is obtained by dividing chi- square by degrees of freedom (x^2/df) , here an improved fit is demonstrated when value of a is less than 3 (Kline,2005). Also, many other indices are also a part of absolute measures group like AdjustedGoodness-of-fit index (AGFI), Goodness-of-fit index (GFI), Root Mean Square Error of Approximation (RMSEA), Root Means Square Residual (RMR/RMSR), these have been laid down to

work around issues related to chi- square. Goodness- of – fit is denoted by GFI and AGFI value near 1 whereas RMSEA and RMR value near 0 denote badness- of – fit (Shah and Goldstein, 2006).The maximum value of such indicators is 1 and the minimum is 0. The relative amount of square sum of difference between observed and estimated covariance matrices to produced variances is depicted by GFI (Schumacher and Lomax, 2004). When the freedom present in the model is taken in consideration the indicator is termed as AGFI. The minimum value for AGFI is equal to or greater than 0.80 whereas for GFI it is equal to or greater than 0.90 for a good model fit as per the IS literature (Gefen *et al.,* 2000).

The average difference between the predicated and the sample covariance matrix is denoted by RMR (Brown, 2006). RMR value of below 0.05 represents a perfect fit (Gefen *et al.,* 2000). But, RMR is not considered suitable for fitting of explanations and evaluating the fit of the model , the better option is to use standardized root mean square residual (Brown,2006; Schermelleh- Engel *et al*.,2003). The average difference between correlations of predicated matrix and sample is denoted by SRMR/ SRMSR (Brown, 2006). According to Kline (2005) if SRMR has a value below 0.10 an appropriate fit is indicated.

The last fit indicator to be considered in this group is RMSEA. The difference between RMSEA and RMR is that it has the ability to be utilized as an indicator which can test whether the model fits the population matrix and is not merely fitting the sample (Hair *et al*., 2006). A good fit is denoted by RMSEA less than 0.05., an average fit is said to occur when RMSEA lies in range of 0.05 to 0.08 (Byrne,2001; Hair *et al*.,2006; Hu and Bentler , 1998; Schermelleh-Engel *et al*.,2003).

Incremental fit indices are another category of fit measures; they are namely TLI, CFT and IFL. In this group of indices a null model is used to draw up a comparison with the hypothetical model (Kline, 2005). A model in which the designed latent variables are presumed to have no correlation is said to be a baseline or null model. The incremental fit indices that are commonly used are Normed Fit Index (NFI), Incremental Fit Index (IFI), Tucker Lewis Index (TLI) or Non- Normed Fit Index (NNFI), Comparative Fit Index (CFI) (Shah and Goldstein,2006).

The difference is x^2 for proposed and base model after division by chi – square of null model is calculated by NFI. The amount of enhancement in the model in comparison to the baseline model is denoted by NFI (Kelloway, 1998). TLI or NNFI is one more incremental fit indicator, the difference with NFI being that it considers the degree of freedom of the proposed and the null model both during evaluation of the estimated

model. The main aim of developing TFI was to mitigate the impact of sample size on NFI (Schermelleh-Engel *et al*., 2003). A modified version of NFI is termed CFI. Since it has a number of benefits, this indicator is quite commonly used (Hair *et al.*, 2006). TLI and CFI differ in the point that TLI takes in account the degree of freedom when assessing the fit which leads to a penalty for non-parsimonious models (Baumgartner and Hamburg, 1996). The problems related to parsimony in TLI index are dealt with in IFI as postulated by Byrne (2001). Similar to the indicators that were discussed above, the minimum value of these indicators has been deemed to be more than or equal to 0.90 for the model to be considered a suitable fit (Hair *et al.,* 2006, Jaccard and Wan, 1996).

6.13 Ethical Issues.

Ethics refers to "the appropriateness of [the researcher's] behaviour in relation to the rights of those who become the subject of [his/her] work, or are affected by it" (Saunders, Lewis & Thornhill, 2009). The research plan has to be in line with its possible

ethical issues. The collected data was anonymous and the specific respondents who gave the data were promised to never be disclosed. The concealing of identity often leads to more precise data as the respondents give honest answers (Collis and Hussey, 2003). It is an ethical requirement that the researcher must explain to the respondent the questions asked and make sure the respondents has proper understanding if the questions asked either in the questionnaire or during the interview. The researcher has timey received an ethical approval from the Computer and Information Sciences Department at Strathclyde University, as listed in the appendix (1).

6.14 Summary.

Both qualitative and quantitative methods were employed to answer the research question of this study. The following data collection methods were used: conducting interviews, distributing questionnaires with close- and open- ended questions, conducting focus groups and interviews with the stakeholders.

7 CHAPTER SEVEN: QUALITATIVE DATA ANALYSIS

7.1 Introduction

This chapter presents the qualitative analysis of the data sets that were collected by the researcher. The data collection and analysis methods were presented earlier in Research Methodology Chapter. The semi-structured interviews have been conducted with the main officials of the m-government program in Saudi Arabia to obtain additional information about m-government in Saudi Arabia, as well as the progress made in Saudi Arabia regarding implementing and adopting those services. The second data set collected was based on the answers to the open-ended question in the survey. This data was collected from students, academic and administrative staff from the King Saud University and the Imam Mohammed bin Saud University. All these participants were considered as potential users of m-government services. The third data set collected in our study was from the focus group.

7.2 Participants in Interviews

The interviewed participants belong to the Yesser program and to MoICT. Their age and expertise levels varied. The details about these participants are summarized in the Table 7.1.

	AGE	DEGREE	POSITION
Interviewee 1	53	Bachelor of Computer Engineering	Saudi National Centre "Amer". Product Manager, e-government program.
Interviewee2	30	Bachelor of Information Technology	E-business Analyst, egovernment program
Interviewee 3	28	MBA	Product manager, egovernment program
Interviewee 4	35	MBA	Web developer, Ministry of Information and Com-
			munication Technology

Interviewee 5	39	MBA	Application Developer, Ministry of Information and Communication Technology

Table 7.1: Participants in Interviews

7.2.1 Reliability and Validity of the Interviews' Data

To assess the reliability of the data obtained from the individual interviews, the participants were asked about the related issues later on during the meeting. The information that was obtained in an interview and deemed important was further explored by asking the participants about the similar issues in the following interviews following the techniques by Emory and Cooper (1991).

7.2.2 Interview Data Analysis

Qualitative data analysis is described as being composed of three main tasks (Miles & Huberman, 1994): data reduction, data display and conclusion drawing. This model was used by El-Kiki (2008) in the analysis task related to the accuracy check and data reduction, open coding and selective coding. From another side, data interpretation was considered in many literature studies as the fourth stage in the data analysis model (Taylor-Powell and Renner, 2003; Sandelowski, 1998; Silverman, 2006; Wolcott, 1994) as shown in Figure 7.1.

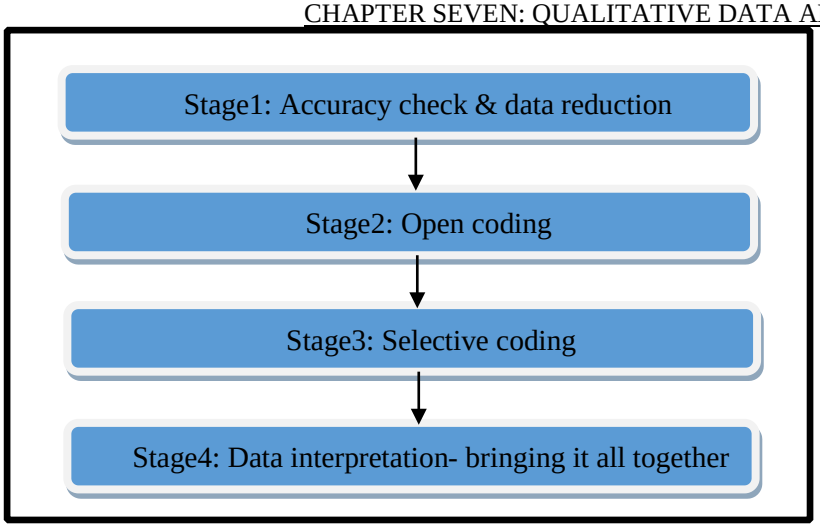

Figure 7.1. Qualitative Analysis Steps.

This study adopted the data analysis model used by El-Kiki (2008). It was enhanced by the fourth stage related to data interpretation. This stage is believed to identify a list of key points and relevant findings obtained after data categorization and storing. Furthermore, this study used NVivo package (NVivo, 2015), version 11, to analyse the interview transcripts in order to identify and interpret the descriptive themes of the interviews.

- Stage 1: Accuracy Check and Data Reduction

One of the common methods for checking the validity and accuracy of data which was used in this study, was to allow interviewees to review and comment their own transcripts before performing the quantitative analysis. Additionally, this study used the notes taken during interviews, reviewed by the participants afterward (Miles and Huberman, 1994).

- Stage 2: Open Coding

This step aims to link the answers for questions in interviews, in order to make the navigation through interview data easy and effortless, as well as to show the existing differences within interviews. Therefore, in this stage, the interview transcripts were grouped by a question and were imported into NVivo. This step has generated section headings based on various questions. This has also led to collating data from various interviews that are related to specific questions. Additionally, data was carefully analysed to extract pertinent information which generated nodes in unstructured format for all the interviews. Hence, there were various free nodes depending on which questions were directly answered by the interviewees.

Following coding answers to questions, the data was analysed line-by-line in order to extract every possible piece of information. It was done through the process of open coding. Subsequently, as shown in Figure 7.2, thirty free nodes were extracted from the five interviews. Since all the questions were not directly answered by the interviewees, there was an ample amount of data that had variety of free nodes.

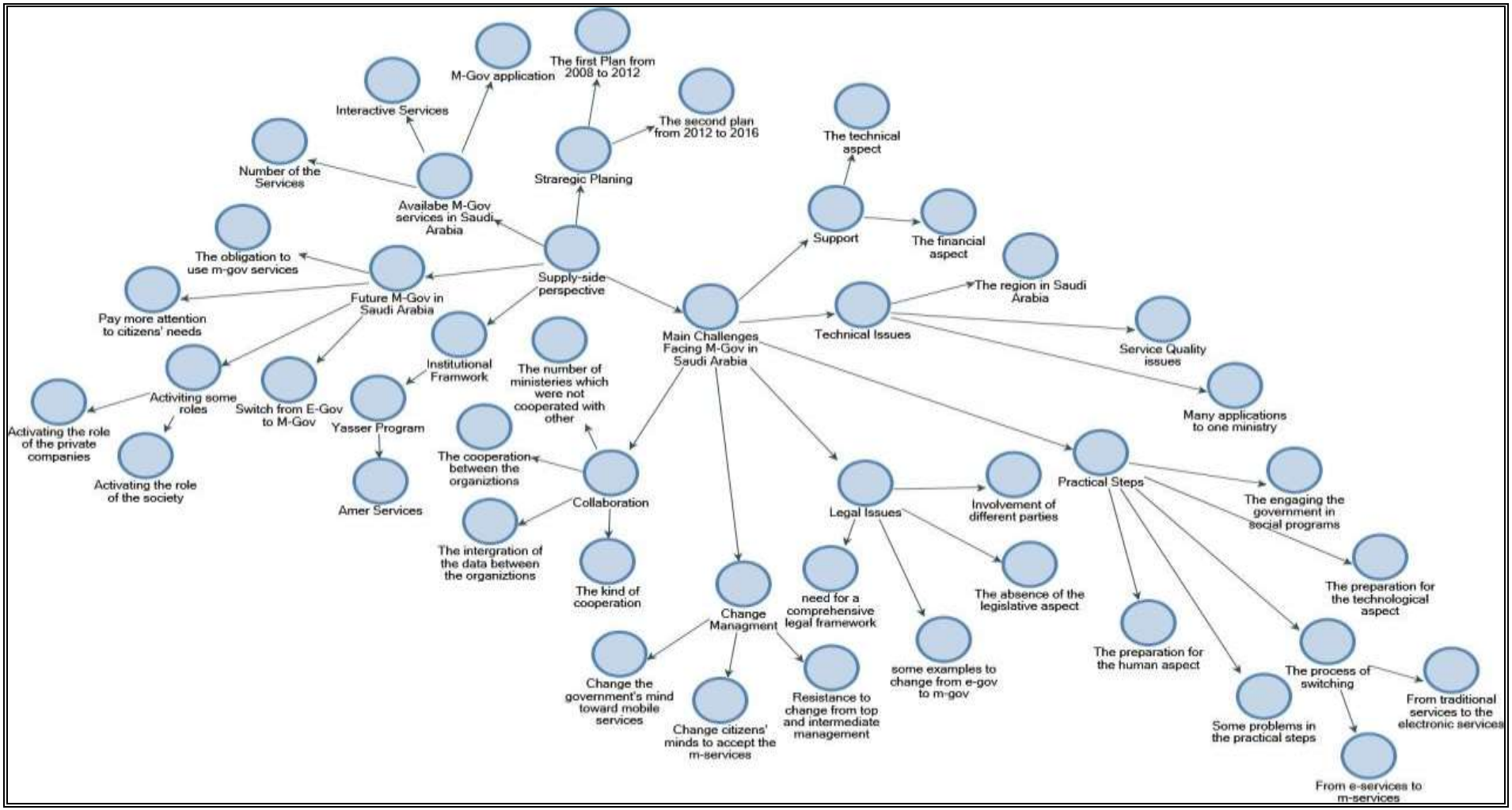

Figure 7.2. Open coding interpreted in free nodes, from supply-side perspective.

- Stage 3: Selective Coding

After running the data in an open coding way, this process aims in delimiting the coding process and making the focus on analysing a specific core variable in all its conditions and consequences. After running the selective coding, five core categories describing the themes dominating the interviewee thoughts have been obtained, as shown in Figure 7.3. Within these five themes, free node obtained in the open coding stage was considered. Furthermore, there were relevant verbatim quotes of interviewees that were considered in the free nodes, and if necessary, were edited based on notes taken during the interviews. Additionally, the synthesis of the free nodes of generated categories is useful for interpreting the explanation given by senior managers about mgovernment in Saudi Arabia.

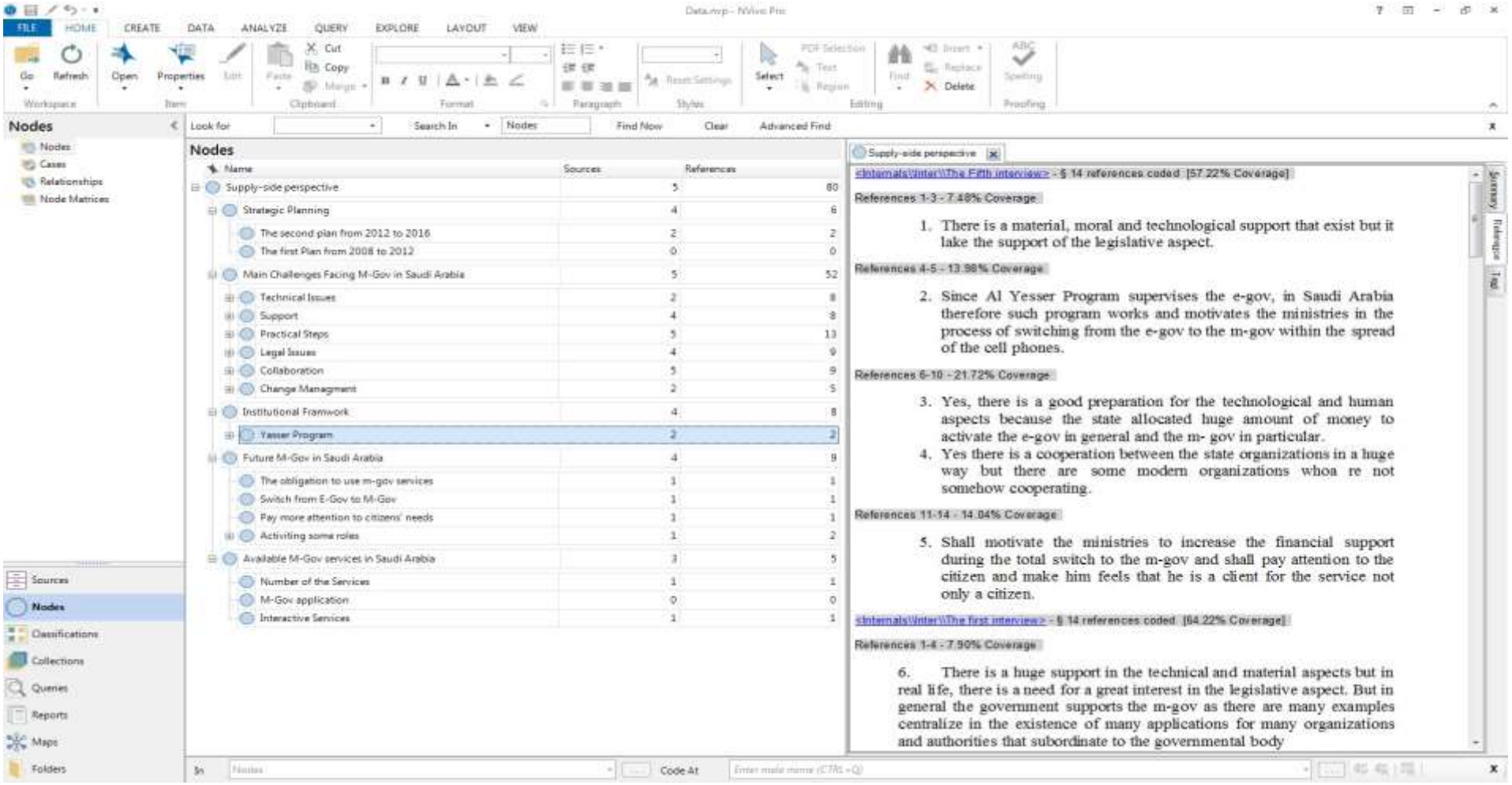

Figure 7.3. Selective coding interpreted in tree nodes, from supply-side perspective

Stage 4: Data Interpretation

This step aims to identify a list of key points and relevant findings obtained after data categorization and storing. Therefore, the five themes that were identified in the interviews. They are:

- Available m-government services in Saudi Arabia,
- Strategic planning,
- Main challenges facing m-government in Saudi Arabia,
- Institutional framework,
- Future of m-government in Saudi Arabia.

These various themes are elaborated in the following section.

7.2.3 Available M-government services in Saudi Arabia

In this theme, the interviewees were asked about statistics regarding the coverage of m-government in the entire country, as well as the participation of citizens in this process. As it was mentioned above, less than half of current ministries in Saudi Arabia are providing their services via phone, which was confirmed by the first interviewee when he said: "Less than half of the current ministries provide their services through the phone".

There is a weakness in the provision of m-services, as many ministries have not published their m-services yet. As a result, it is required for the citizens to travel to the main centre providing the service, as mentioned by the second interviewee: "40% of governmental organizations apply m-government program".

The number of applications was mentioned by the third interviewee when he said: "There are 83 applications from organizations and state ministries, which became available to the citizens at the end of 2015".

7.2.4 Future M-government in Saudi Arabia

The participants in interviews were asked about the future measures that they believed were required or would be useful to improve the adoption of m-government. The participants were aware that some ministries were planning to continue providing the

material support to the process of shifting to m-government, as e.g. it was mentioned by the first interviewee:

"Motivating ministries by increasing the material support during the total shift to mgovernment, as well as paying more attention to the citizen and making him feel to be like a client for the service, and not just a citizen".

Many ministries will need material, technical and legislative support in order to spread the use of m-government in future. This understanding was confirmed by the second interviewee when he said:

"In order to execute the plans, it is necessary that the government supports the governmental organizations (in terms of material, moral, technical and legislative support) for the spread of m-government".

Furthermore in order to encourage the citizens to adopt m-government services, many ministries should make the use of m-government in proving some of their services as compulsory. Another way of encouragement is to reduce the requirements for mgovernment services, or to offer exemption from the fees, when compared to the traditional ways of providing these services by traveling to the center providers' of the services. These suggestions were mentioned by the third interviewee as follow:

"It is necessary to make the use of m-government services in some ministries as mandatory. Also, to have sort of motivation so that you can make your request with the least requirements and time possible compared to the traditional way, in addition to the exemption of some fees for some services which you perform through the phone".

Some ministries plan to activate the role of society and private companies by developing applications specific to these ministries, as well as considering new ideas about mgovernment project, as it was expressed by the fourth interviewee:

"Activating the role of society and providing some data for them to develop some applications which could help some of the ministries that are delayed in applying mgovernment, in addition to activating the role of private companies".

7.2.5 Institutional Framework

At this point, the interviewees were asked about the administrator of m-government services in Saudi Arabia, how the support was provided and whether there were any m-government services. The administrator of m-government is the Yesser program that was launched in 2005. It is currently in charge of the transfer process from egovernment to m-government, as it was mentioned by the second interviewee:

"Since Yesser Program is the supervisor for m-government in Saudi Arabia, therefore it works and motivates the ministries during the process of switching from the egovernment into m-government".

Additionally, Amer project is part of the m-government program that is being administrated by Yesser program as we can read from the quotation of the fourth interviewee:

"We work in the national contact center (Amer), and we receive monthly 50thousand phone calls in order to support the e-government project. Currently, we deal with 14 governmental agencies, which will increase to 20 governmental agencies in the middle of 2016".

Regarding the provided support, actually there is a material and technical support that is being provided. However there is a lack in the legislative support, as it was expressed by the first interviewee:

"Since the majority of Saudi people are youths, then the government should pay more attention to the development they live in. Hence, the government provided all the moral and material support required for the application of m-government program. Thus, it has set up the Yesser project in 2005 that is specialized in providing electronic services. Later on, this project performed the transition from e-government to mgovernment stage. However, to be honest, this project lacks the legislative and legal aspects. Also, I believe that it is necessary to apply the strategic plans that were previously made".

7.2.6 Challenges facing m-government implementation and adoption

Despite the progress that has been made, a number of challenges are encountered. This section presents the main challenges of m-government implementation in Saudi Arabia based on the interviews with the m-government officials.

7.2.6.1 Change Management

Many citizens do not like that change and prefer to continue receiving services in the traditional ways by traveling to the center provider of these services, as it was confirmed by the first interviewee: "There are many citizens who do not want to change". Additionally, the existence of a supervisor who provides support and motivation about m-government services in each ministry would be helpful, as it was stated by the second interviewee:

"It is necessary for higher authorities in organizations to support and motivate their personnel in order to switch from e-government into m-government. Therefore, it is necessary to have a leader or a manager in each organization to be the first supporter and supervisor of the execution of m-government. Regarding the existing problems, there are material, technical and also human resource problems. Hence, it is necessary to have interdepartmental relationships between governmental departments for cooperating and executing".

The above quotations reflect one of the main obstacles which are the involvement of managers and higher authorities within each organisation, for facilitating and motivating their employees about the shift from e-government into m-government. Other obstacles included the support from the technical, material as well as human resources side.

7.2.6.2 Strategic Planning

Strategic plans that should be undertaken in future were also discussed with the interviewees. It is expected that from these plans it will help in achieving a full implementation of m-government project in the country.

One of these plans is to increase the material and technical support for each ministry in order to move to m-government. Plans are also there to improve the quality of treatment provided to the citizens as they should be considered as customers and not just mere citizens. This was highlighted by the first interview as the following:

"Motivating ministries by increasing the material support during the total shift to mgovernment, as well as paying more attention to the citizen and making him feel to be like a client for the service, and not just a citizen".

Another plan is that the government should support and prepare the various ministries for a shift into m-government. This has already been performed for some ministries, as mentioned by the second interviewee:

"The government has motivated and supported different governmental organisations to switch from e-government to m-government. As a proof of this, many of governmental agencies were asked to execute the m-government services, including its applications".

Hence, it is clear that the government is aware of the improvements and updates that are required to accomplish the shift from e-government to m-government successfully.

7.2.6.3 Technical Issues

The technical aspects of m-government were also discussed during these interviews. This included the requirements to have m-government services with high quality.

Saudi Arabia is a very large country with a varied topography (desert, mountains, rivers, etc.). There are some regions that do not have phones and internet coverage. This was mentioned by the fourth interviewee:

"There are some areas and regions in the Kingdom of Saudi Arabia that do not have coverage for mobile phones or the Internet".

There are some technical problems related the diversity of applications per ministry which decreases their quality, as it was confirmed by the second interviewee:

"There is more than one application that subordinate to the same ministry, and each application performs different unique services. Additionally, there is absence of the technical support from the companies specialized in it".

One of the essential issues that will help and play an important role in the spread of mgovernment is the need for high-quality services. This was quoted by the first interviewee as follows:

"It is necessary to have services with high quality, which is one of the most important reasons that will lead to the spread of using m-government services in general".

Hence, the improvement of the quality aspect of applications will positively affect the number of users, as the fifth interviewee suggested:

"The quality is required in all types of services, including mobile services. However improving the quality will increase the percentage of users. Hence, it is required from governmental organisations to improve their services and search for distinctive features".

The obtained results reflect some existing technical obstacles such as the absence of coverage in some areas of the country (i.e. mobile and Internet), as well as the absence of technical support from private sectors. Nevertheless, the interviewees were aware about the role that the technical side and the quality of provider services played for a successful implementation of m-government. They were also aware about the extent to which these factors could motivate or obstruct the citizens from adopting these services.

7.2.6.4 Support

The interviewees were asked about their opinions concerning the existing support from the country and government authorities regarding the implementation of mgovernment. The first interviewee said that even though there is material and technical support provided, there always is a clear lack in the legislative support:

"There exists a material, moral and technological support, but all these lack to the legislative aspect".

This was also echoed by the second interviewee:

"There is a huge support in the technical and material sides. However in reality, a great interest should be given to the legislative side. Nevertheless, in general the government is supporting m-government as there are many examples of existing applications for many organizations and authorities that subordinate to the governmental body".

It seems it is necessary to have clear legislations that serve m-government projects. Also, there should be a manager for the transformation process, in order to transfer from the traditional way to the electronic way and eventually moving to the mgovernment services. Therefore, the legislative support will help in the spread of mgovernment services, for example, as it was mentioned by the third interviewee:

"When someone applies for a passport, there is a fee of 150 Riyals. But if there was a procedure that reduces such application fee to 120 Riyals, then this would have been better for encouraging citizens. Therefore, it is necessary to make

clear legislations in order to spread the usage of the cell phone in the electronic government".

In general, all interviewees agreed about the existence of technical and material support although this support was not sufficient. They also agreed about the lack in legislative support that might make a huge difference for boosting the m-government project towards a full implementation, such as, by endorsing a procedure for reducing the fees on passport applications that are made electronically.

7.2.6.5 Practical Steps

The question that was asked in this theme aimed to uncover the planned procedure for implementing m-government program. The obtained answers varied as follows:

"Yesser program has performed a good preparation from the technical, human resources and material sides. However, there are some lacks of the awareness which is an important issue for the spread of m-government. Especially that some ministries didn't invest in a good marketing for their services to the citizen, to make them aware about the usability of these services".

Hence the awareness issue is much related to the spread of m-government, as it was mentioned by the first interviewee:

"Yes, there is a very good preparation. However, there is weakness in the awareness at the level of governmental organisations, mainly in the marketing for the electronic or application product. Therefore, there is a decline in the application phase".

The second interviewee said that

"It was previously prepared, and the reason for that was the process of shifting from traditional services to electronic services. Therefore, the shift process required many practical steps".

If seen from a different angle, Saudi Arabia has achieved an advanced stage worldwide in using social programs. Many ministries are included in these programs who aim to reach out to a large category of Saudi users, majority of which includes the youths. This was clearly mentioned by the fifth interviewee:

"Therefore the youth category are interested in this service, as well as in everything new, thus they always desire to explore every new thing in the

applications world. Hence, the governmental support is very present especially through social programs. This has made of Saudi Arabia a leader in providing such material and moral support".

The shift process from e-government to m-government is different for each ministry. Hence, Yesser program has classified the various ministries into three levels: distinct, average and the humble. The distinct ones are those who provide m-government for some of their services, as mentioned by the third interviewee:

"The process of switching from e-government to m-government requires too many steps. Therefore, the switching process is not equally executed among the various governmental organizations. Hence, there are distinct organizations, average organizations, and also humble organizations. Whereas the distinct organizations are those who provide the m-government program".

According to the participants, many preparation steps including human, technological, material, as well as moral support are already in place in the second plan (2012-2016). However other steps are not sufficiently tackled, such as the awareness and marketing of m-government programs.

7.2.6.6 Collaboration

This concerns the cooperation between different government and public organisations in the field of information technology which is required in order to boost the implementation of m-government. There were a variety of answers, in this case, from the participants. Some of them confirmed the existence of such cooperation, although the degree of this cooperation varied. For instance, it was confirmed by the first interviewee that:

"Yes there is a great cooperation between the state organizations. However, there are some organizations that are not cooperating to some extent".

The second interviewee supported the previous opinion about the existence of collaboration. However, it still needs too many steps to achieve the integration of data and information:

"The cooperation exists already between public organizations. However, it still needs too many steps to achieve an integration of data and information

between different governmental agencies in order to reach the aim of providing comfort, and saving efforts and time for the citizen".

There is a small number of ministries that do not cooperate with the Yesser program (as being the supervisor of e-government and m-government), nor with other ministries. However, Yesser program has provided the material and technical support and has also participated in planning for the application of m-government. This was mentioned by the third interviewee:

"2% of state organizations didn't attend or respond to Yesser program which is the umbrella that supports m-government program. However, in general there is cooperation between organizations and Yesser program, as well as between organisations with each other. Actually, there are several alternative ways for motivating organizations, such as the material support, technical support and planning in order to apply the mgovernment program".

If seen from another area, there is a low cooperation which is still below the required level, as said by the fifth interviewee:

"There is cooperation for sure but it is very weak and not as required. Therefore, we can notice a weakness in the phase of shifting from the e-government to the mgovernment".

As we can see from the above answers, the government plans include cooperation between various bodies. However, that cooperation is still in its early stages, especially at the level of data and information integration. Additionally, there are few state organisations that are not responsive with Yesser program as they are responsible for m-government project. Other interviewees expressed their thoughts about the weakness of cooperation between various organisations which they felt will affect the smooth shift from e-government to m-government.

7.2.7 Summary of Themes

The above themes can be briefly summarized as following:

1) There is a weakness in the provision of m-government, as many ministries in Saudi Arabia have not published their m- government yet.
2) Many ministries will need material, technical and legislative support in order to spread the use of m-government in future.

3) The ministries should make the use of m-government in providing some of their services as compulsory.
4) Some ministries plan to activate the role of society and private companies.
5) Amer project is part of the m-government program that is being administrated by Yesser program.
6) Many citizens do not like that change (using m-government) and prefer to continue receiving services in the traditional ways by traveling to the center provider of these services.
7) The existence of a supervisor who provides support and motivation about m-government services in each ministry would be helpful
8) It is clear that the government is aware of the improvements and updates that are required to accomplish the shift from e-government to mgovernment successfully.
9) One of the essential issues that will help and play an important role in the spread of m-government is the need for high-quality services.
10) The cooperation is still in its early stages, especially at the level of data and information integration. Thus, there is a small number of ministries that do not cooperate with the Yesser program.

7.3 The Participants in the Focus Group

There were two sets of participants in the focus group. The first set included five participants from the King Saud University, where the focus group duration was for 45 minutes. The participants in this set were of various ages and from several expertise as shown in the Table 7.2. The second set included seven participants from the Imam Mohammed bin Saud University. Here the interviews continued for duration of 41 minutes. The participants in this set belonged from different age groups and from different level of expertise as shown in the Table 7.3.

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King Saud University 45 Mins	**The age**	**The degree**
The first participant	28	Bachelor of medicine
The second participant	30	Master of Applied Medical Sciences
The third participant	25	Bachelor of Science
The fourth participant	24	Bachelor of Information Technology
The fifth participant	32	Master of Applied Medical Sciences

Table 7.2: The participants in the first focus group.

King Imam Muhammed Bin Saud University 41 Mins	**The age**	**The degree**
The first participant	29	Bachelor of medicine
The second participant	31	Bachelor of medicine
The third participant	35	Bachelor of medicine
The fourth participant	34	Master of Information Technology
The fifth participant	31	Master of Computer Science
The sixth participant	27	Master of Education
The seventh participant	26	Bachelor of Science

Table 7.3. The participants in the second focus group.

7.3.1 Focus Group Data Analysis

Qualitative data analysis was described by Miles and Huberman (1994) as being composed of three main tasks: data reduction, data display and conclusion drawing. This model was used by El-Kiki (2008) in the analysis task related to accuracy check and data reduction, open coding and selective coding. From another perspective, data interpretation was considered in several studies in the prior literature as the fourth stage in the data analysis model (Taylor-Powell and Renner, 2003; Sandelowski, 1998; Silverman, 2006; Wolcott, 1994) (Figure 7.1).

The study adopted the data analysis model used by El-Kiki (2008), which was also enhanced by the fourth stage related to data interpretation. Furthermore, we used NVivo package, version 11, to analyse interview transcripts, in order to identify and interpret the descriptive themes of the focus group.

- Stage 1: Accuracy Check and Data Reduction

One of the common methods for checking the validity and accuracy of data, which was used in this study, was to let interviewees to review and comment their own interviews before performing quantitative analysis on them. In addition, the researcher utilised his own notes taken during the interviews in order to test and correct any distorted data resulting from the audio recordings. Further research concluded that, data reduction aims to report and summarize the declaration of interviewees (Miles and Huberman, 1994).

- Stage 2: Open Coding

This step aims to link the answers for questions in interviews, in order to make the navigation through interview data easy and effortless, as well as to show the existing differences within interviews. Therefore, in this stage interview transcripts were grouped as per the questions. It was then imported into NVivo software. This step generated section headings based on various questions, which led to collating data from various interviews that were related to specific questions. Additionally, data was carefully analysed to extract pertinent information which generated free nodes for five interviews. Hence, there were various free nodes depending on which question were directly answered by interviewees.

Following coding answers to questions, data was analysed line-by-line in order to extract every possible piece of information; this is the process of open coding. Subsequently, as shown in Figure 7.5, thirty-seven free nodes were extracted from the five interviews. Not all questions were directly answered by the interviewees, so there was an ample amount of data with variety of free nodes.

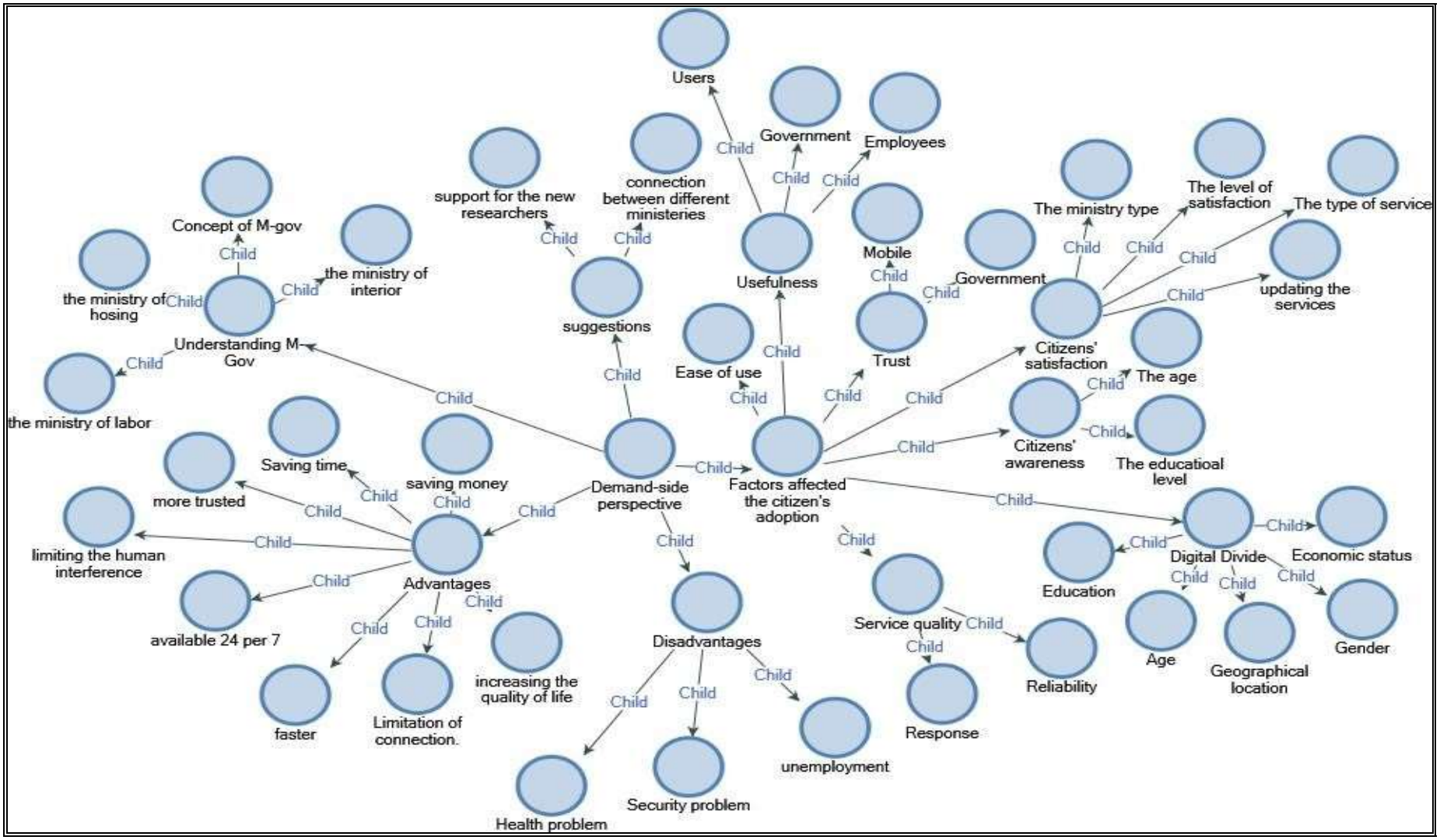
Users
Government
Employees
Child
support for the new researchers
connection between different ministeries
Concept of M-gov
the ministry of hosing
the ministry of interior
Understanding M-Gov
suggestions
Usefulness
Mobile
Government
The ministry type
The level of satisfaction
The type of service
updating the services
Citizens' satisfaction
The age
Ease of use
Trust
the ministry of labor
Saving time
saving money
more trusted
Demand-side perspective
Factors affected the citizen's adoption
Citizens' awareness
The educatioal level
limiting the human interference
Advantages
Digital Divide
Economic status
Education
Gender
Age
Geographical location
available 24 per 7
Disadvantages
Service quality
Reliability
Response
faster
Limitation of connection.
increasing the quality of life
unemployment
Health problem
Security problem

Figure 7.5. Open coding interpreted in free nodes, from supply-side perspective.

- Stage 3: Selective Coding

After running the data in an open way, this process aims in delimiting the coding process and making the focus on analysing a specific core variable within all its conditions and consequences. This selective coding should be performed within the total context developed during open coding stage (Glaser, 1978)

After running the selective coding process, five core categories describing the themes dominating the interviewee thoughts, were identified. This stage is shown in Figure 7.6. Within these five themes, free nodes obtained in the open coding stage were considered. Furthermore, relevant verbatim quotes of interviewees were considered in the free nodes and if necessary they were edited based on notes taken during the focus groups meetings. Additionally, the synthesis of the free nodes of generated categories is useful for interpreting the explanation given by senior managers about mgovernment in Saudi Arabia.

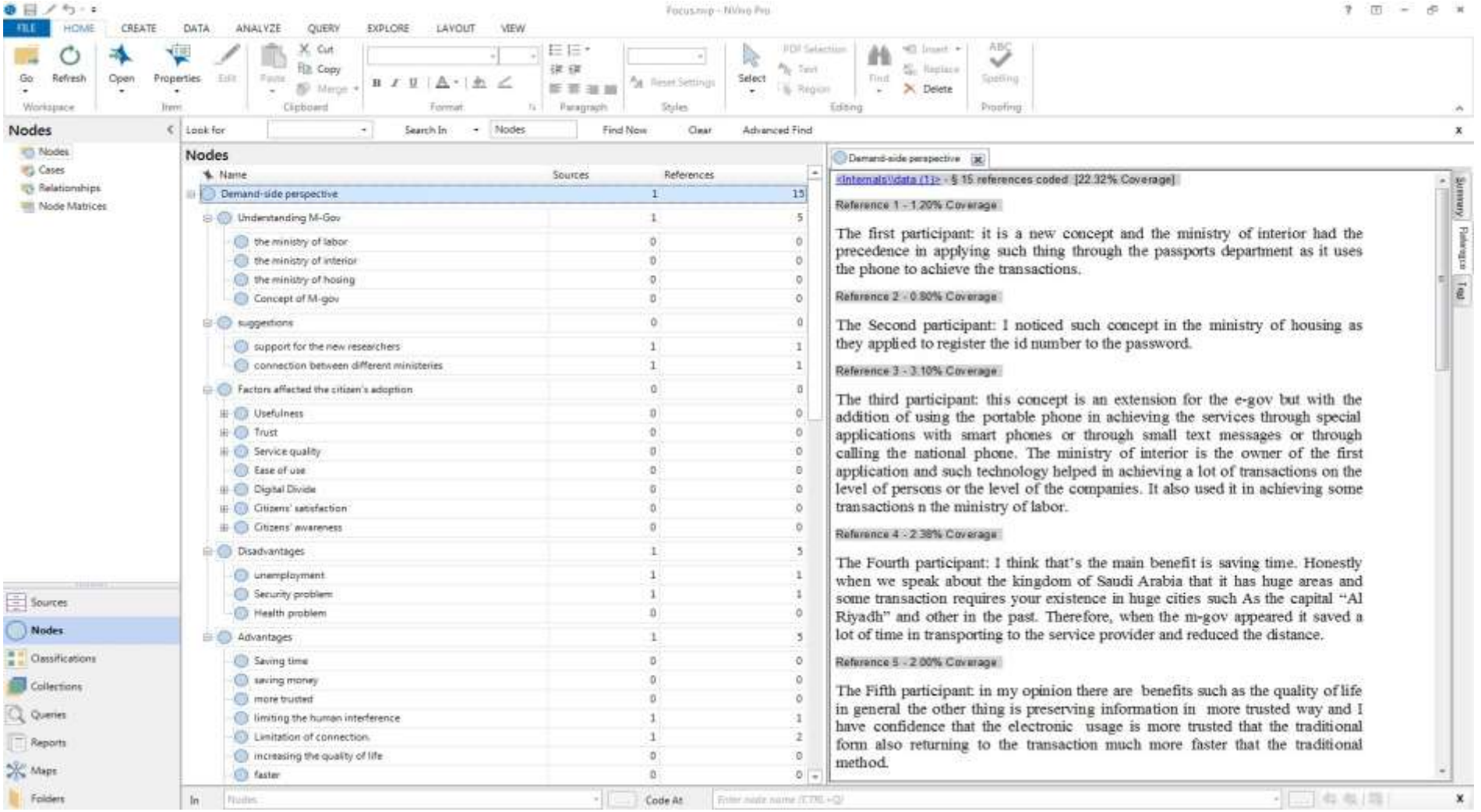
Nodes
Demand-side perspective
Understanding M-Gov
the ministry of labor
the ministry of interior
the ministry of hosing
Concept of M-gov
suggestions
support for the new researchers
connection between different ministeries
Factors affected the citizen's adoption
Usefulness
Trust
Service quality
Ease of use
Digital Divide
Citizens' satisfaction
Citizens' awareness
Disadvantages
unemployment
Security problem
Health problem
Advantages
Saving time
saving money
more trusted
limiting the human interference
Limitation of connection
increasing the quality of life
faster
The first participant: it is a new concept and the ministry of interior had the precedence in applying such thing through the passports department as it uses the phone to achieve the transactions.
The Second participant: I noticed such concept in the ministry of housing as they applied to register the id number to the password.
The third participant: this concept is an extension for the e-gov but with the addition of using the portable phone in achieving the services through special applications with smart phones or through small text messages or through calling the national phone. The ministry of interior is the owner of the first application and such technology helped in achieving a lot of transactions on the level of persons or the level of the companies. It also used it in achieving some transactions n the ministry of labor.
The Fourth participant: I think that's the main benefit is saving time. Honestly when we speak about the kingdom of Saudi Arabia that it has huge areas and some transaction requires your existence in huge cities such As the capital "Al Riyadh" and other in the past. Therefore, when the m-gov appeared it saved a lot of time in transporting to the service provider and reduced the distance.
The Fifth participant: in my opinion there are benefits such as the quality of life in general the other thing is preserving information in more trusted way and I have confidence that the electronic usage is more trusted that the traditional form also returning to the transaction much more faster that the traditional method.

Figure 7.6. Selective coding interpreted in tree nodes, from demand-side perspective.

Stage 4: Data Interpretation

This step aims to identify a list of key points and relevant findings obtained after data categorization and storing. Therefore, the five themes that were identified in focus groups are as follows:

- Understanding M-Gov,
- Factors affected the citizen's acceptance of mobile government,
- Advantages,
- Disadvantages,
- Suggestions.

These various themes are presented in the following section where each of them are discussed with focus groups quotations and interpretations.

7.3.2 Understanding M-government Services

Many respondents were asked about their understanding of m-government services, especially that these services represent a new concept for many people in Saudi Arabia. Therefore, there was variety of answers that were obtained. Some of the respondents said that they are used to m-government, whereas others confirmed that they have no idea about it at all. However, many group participants and questionnaire respondents confirmed their understanding of what "m-government service" means.
For instance, Participant 1 (focus group 1) said:

"It is the management of your governmental transactions by using your mobile phone. Personally, I have used my cell phone during the last year to accomplish my electronic services".

Talking differently, Participant 3 (focus group 1) said:

"this concept is an extension of e-government, with the addition of using portable phones to accomplish government services through special applications in smart phones, by sending short text messages, or through calling national centres. Such technology helped in achieving many transactions at personal level, as well as on company's level. The Ministry of Interior is the owner

of the first application. Today it is being used also in achieving many transactions in the Ministry of Labor".

However, few participants from focus group said that they were able to guess the meaning of m-government services. One participant mentioned that "m-government" can be anything electronic that is related to government organisations".

Furthermore, it was clear from a range of respondent's comments that m-government is something known for Saudi public. This confirmed the qualitative data in which many respondents confirmed their use of m-government services.

7.3.3 Factors that affect the citizens' acceptance of m-government

The interviewees reported several factors affecting the citizens' adoption of mgovernment services in Saudi Arabia. These factors can be classified as explained in the following subsections.

7.3.3.1 Usefulness of M-government

This aspect was discussed with focus group participants and questionnaire respondents. More specifically they were asked about the benefits they can get when they run their business with m-government. Hence, many benefits were heard from the participants. Those benefits highlighted the usefulness of m-government towards its distinct users, i.e. private citizens, business and government employees.

The usefulness of m-government for citizen was expressed by many respondents either from focus groups or from open-ended questionnaires. Therefore, it was mentioned by many of them that broadening the access to the population should rely mainly on using current communication technology while providing government services. Moreover, many respondents mentioned the importance of providing useful information about government services on websites. This should save citizen time and efforts, as it helps them to prepare the documents that are required for any procedure in advance.

If viewed from a different perspective, the majority of the respondents have agreed about the advantages of the provision of m-government services to citizens, which they also feel will save peoples' time, effort and money. They feel it will be an easy access as benefits from these services can be received anytime, during the day or at night, without a need to visit the government department in question. A typical answer of a respondent

would be that "the mobile government saves time and effort, as well as money". Other participants in focus groups and questionnaires responded that mgovernment will also contribute in reducing travel costs and efforts and waiting in queues. For instance, Participant 4 (focus group 1) mentioned that:

"I think the main benefit of m-government is saving time. Honestly, when we speak about a country like the Kingdom of Saudi Arabia that has large areas, we should know that many transactions required in the past need your presence in large cities such as the capital Al-Riyadh and other cities. Therefore, the appearance of mgovernment has saved time of transport to the service provider, and reduced the distance as well".

Additionally, it is clear for the citizens that m-government is more beneficial to them than any other services. It is mainly because there is a transparency regarding the requirements and rules of providing m-services, as well as being far from human biasness in taking decisions. For instance, participant 4 (focus group2) said:

"The clarity of laws and policies, as well as the clarity of requirements that you have to provide, in addition to being far from the bias of humans which might affect the acceptance or refusal process".

Furthermore, the usefulness of m-government was linked by many respondents and participants as a positive experience that they have faced. They felt content as they received a relevant response to their service enquiry. Thus, having a negative experience, for example by receiving incorrect response to their enquiry, will obstruct the citizen from using the services again. For instance, Participant 5 (focus group 1) said:

"I used the application and short text messaging service for the first time for experiment only, and I acquired my requirements, which is achieving my transaction. Therefore, I will use such services in the future. However, if the quality of such services will deteriorate, then I will go back to the original service provider again".

M-government services was seen by many respondents and participants as a solution that will significantly affect government employees' performance by reducing work

pressure on them, reducing their errors and improving their skills in computing and internet. Thus, Participant 1 (focus group 1) said:

"There is a benefit of m-government, which is limiting the human interference as it would be serious when applying the system".

Many of the focus group participants and questionnaire respondents highlighted the importance and necessity of extending m-government services throughout the country. They justified this vision by the fact that a full implementation of m-government will help the country in dealing with the rapid development. One of the respondents added that m-government services would help in improving government's performance, especially when delivering its services. For instance, Participant 5 (focus group 2) said:

"There are some benefits for the citizen as well as for the government. Thus, the citizen will save time and effort, whilst the government will provide speed in accomplishing the transactions. Some ministries do not have enough space to receive auditors, nor to allow access to such places".

Therefore, the benefits of a full implementation of m-government will reach all levels, citizen, employees as well as the country itself.

7.3.3.2 Ease of Use

The easiness of using m-government was confirmed by many questionnaire respondents, as well as by several focus group participants, as they were already familiar with using mobile and internet services. Participant 1 (focus group 2) said:

"I have already used many m-government services of different ministries, and it was very easy to use".

Also the use of m-government became easier when it was connected to other programs. For instance, participant 2 (focus group1) said:

"In the past, there was kind of a difficulty. But today it became very easy to use mgovernment services, especially when it is connected to other programs or through requesting automatic help. For example, now some services accept from you a scan of a photo or a document".

Furthermore, it will be much easier if the ministries will be connected to each other. For example, participant 3 (focus group 2) said:

"Yes, I found that m-government is very easy to use in achieving my governmental transactions. The easiness happens mainly when many ministries can connect with each other. And I think m-government will get easier in the future than what it is today".

Additionally, the existence of mobile phones has hugely affected the ease of using of m-government, in addition to the existence of internet. This was expressed by participant 4 (focus group 2) said:

"The existence of smart phones affected hugely the easy usage we have today, as well as in the process of adopting these services. Additionally, the existence of Internet has facilitates the usage of m-government".

However, some of the ministries are providing video recordings to help in understanding the use of m-government, especially for elderly people. For instance, participant 2 (focus group 1) said:

"For the current generation, I do not think that m-government services are difficult to use, because the majority of them have already smart phones. However, it will be difficult for the old generation to deal with these services. Therefore, I believe that having video recordings explaining the method of usage of such services will make things easy to them".

Therefore, the current generation will not face difficulties or problems in using mgovernment, as they already knows in and out in terms of using mobile devices. However, it is necessary to provide means to teach elderly people how to use such a technology. It can thus be done by taking help through video recordings and graphics that will in return facilitate the use of m-government.

7.3.3.3 Connections ("Wasta")

The concept "wasta" in Arabic culture refers to "a form of corruption that involves using one's connections and influence in places of power, to get things done outside normal procedures" (Epyon, 2005). Therefore, when asked about the effect of implementing m-government services on the widespread of "wasta" in Saudi Arabia, many participants

confirmed that they believe that m-government services will limit the usage of "wasta" and "any unusual procedures would be automatically rejected by the system".

Furthermore, it was confirmed by qualitative data that many respondents expect from m-government services to give equal chances to all citizen to conduct their business with the government which they considered as the main advantage of m-government. Hence, Participant 2 (focus group 1) said:

"This is considered as a great advantage of m-government, as it does not recognize the person who uploads the data (like his skin colour, description and height), but just his data. Therefore, there will be no human effect. Hence, if the transaction has fulfilled all its conditions then it will be accepted, otherwise it will be rejected. Also, the application will be available 24/7, and nothing could affect it as the employee might be passing through certain conditions or social conditions, and not being fully focused, which might cause a rejection of the application".

This was also confirmed by participant 5 (focus group 1) when he said:

"I think that m-government has hugely limited the human interference, as it is based on executing the system correctly and not according to specific interests. So I wish that m-government services will spread in order to limit the mediation of human".

As it can be seen, the majority of participants and respondents expressed their opinions and hopes that m-government services will be a mean for decreasing corruption ("wasta").

7.3.3.4 Digital Divide

The digital divide issue was a concern for few participants in the focus groups who believed that this would be a disadvantage for the m-government services. This includes mainly older people who do not have ICT and mobile skills, as well as many foreign workers on low income who can hardly afford smartphones. These factors will limit the usage of the m-government services. Many of the respondents believe that mgovernment services are better and easy for the new generation whereas they are difficult to use for the old people population. Furthermore, many questionnaire respondents and group participants confirmed the existence of a link between the ease of learning and using m-government services to the experience with the mobile phones. Other group participants mentioned also some problems related to using mgovernment services. One participant from a focus group mentioned the factor of computing/internet illiteracy in the country and how it should have been resolved by the government to eliminate such illiteracy.

For instance, Participant 2 (focus group 2) said:

"For the current generation, I do not think that m-government services are difficult to use, because the majority of them already have smartphones. However, it will be difficult for the old generation to deal with these services. Therefore, I believe that having video recording explaining the method of usage of such services will make things easy to them".

Contrarily with the last participant's response, other participants argued that the government was serious about eliminating computer and mobile illiteracy from the society by teaching those skills at schools. However, they last participants blamed people who already have necessary ICT skills but were not interested in improving their knowledge to be able to use it in their daily life. This point of view was also confirmed by many participants who admitted that there is failure for not learning how to use computers and mobiles. Regarding the ownership of resources required for using mgovernment services, such as computers, mobile and Internet access some respondents have linked them to the adoption of m-government services, especially for those with a low income in the country. However, other respondents considered the ownership of resources as not being an issue, as many people are still hesitant in adopting the mgovernment services. The hesitation is due to the fear of change in the way they deal with government about their business and for various other matters. These are fears related to age, resistance to ICT, lack of skills, etc. In addition, some regions in Saudi Arabia have low internet access or no access at all, which will affect the use of mgovernment. For instance, participant 2 (focus group 1) said:

"I do not agree about these opinions, as there are some regions in the Kingdom that do not have Internet access at all, whilst some others have Internet but it does not allow you to upload files or photos for your transaction because the connection is weak, such as in southern regions of the country".

If all the answers are concluded that are given by the respondents and participants, the technical aspect of m-government services constitutes an important obstacle that should be resolved to make the implementation of m-government easy and smooth.

7.3.3.5 Trust in the Mobile

Participants and respondents have presented various responses to the question about trusting mobile devices for conducting business with the government. Thus many of the focus group participants believe that using m-government service is safe and provides

security with its well-equipped software and supporting technology. For instance, Participant 1 (focus group 1) said:

"I am willing to use my cell phone to accomplish my government transactions because of the great technology in such services".

Also, there are some citizens who have trust in mobile devices but do not trust the private companies who subordinate to the ministries. For instance, participant 2 (focus group 2) said:

"Yes, I see that trust can highly affect the usage of services of m-government as I trust the ministries in general, but I do not trust applications of private companies that subordinate to these ministries".

Other participants expressed their concern about their personal data to be played by hackers, especially that there are no laws yet in Saudi Arabia that protects users' privacy. For example, participant 3 (focus group2) said:

"Yes, there might be some hacking and weakness in the level of security and privacy, unlike the traditional way".

Variety of answers obtained from participants and respondents reflected their positive and negative perception of m-government application. Furthermore, it was shown in the answers, the link that exists between trust and ICT skills of government employees.

7.3.3.6 Trust in Government

When being asked about the trust in the government that enabled them to use mgovernment services, the focus group participants replied that they were ready to use these services and confirmed their trust in the government. For instance, participant 6 (focus group 1) said:

"Yes, I think so. For example, I really trust the services provided by the ministry of Interior, therefore I am using their m-government on a weekly basis to achieve my electronic transactions".

Also, there are some citizens who trust the government more as it is the supervisor of these services but do not trust the private companies. For instance, participant 3 (focus group 2) said:

"Sometimes it is easy to hack smart phones, however I have a full trust that governmental services that are spread through the Internet or through m-

government program are of a very high quality, because the government is the one who supervises such services and not the company".

There is an agreement between the answers of focus group participants about trusting the government. Therefore, they confirmed their trust in the government as it is directly in charge of m-government services and that there are no intermediate companies between them.

7.3.3.7 Citizen Satisfaction

Focus group participants and questionnaire respondents were asked many questions to assess their satisfaction about experienced m-government services especially when compared to their expectations. Participants and respondents were also asked whether their satisfaction differs according to the used services. Below are few examples of their answers.

For instance, some participants have different degrees of satisfaction from a ministry to another, such as participant 5 (focus group2) who said:

"in general I am satisfied with the level of m-government in Saudi Arabia, but I would like to clarify that the degree of my satisfaction is different from one ministry to another".

Other participants expressed that they might have a different degree of satisfaction from a service to another participant 1 (focus group 1) said:

"I think that the level of satisfaction related to the types of service, if a ministry guides the citizen to some new services and how to use them. This will affect the knowledge of citizen about provided services, which will consequently affect the levels of satisfaction of the citizen".

Also, some other participants linked the measurement of satisfaction to the first experience with the service, such as participant 2 (focus group 1) who said:

"The level of satisfaction depends hugely on the success of the first trial using mgovernment. For safety, I have used m-government services many times, and until now I am satisfied with the level of m-government in the Kingdom".

This point of view was also confirmed by participant 3 (focus group 2) who said:
"Normally my satisfaction affects the use of m-Government. Hence, if I am not

satisfied with the application nor the service through text messages, then I will not use it again".

From another side, the level of satisfaction may differ from one day to another day as there is a continuous update of m-government services, as mentioned by participant 4 (focus group 1) who said:

"If the application subordinates to the ministry, and this ministry is updating it continuously, this will increase the level of satisfaction to me".

After obtaining several answers from participants and respondents, it seems that there is a general satisfaction about m-government level in Saudi Arabia. However, the degree of this satisfaction differs from one ministry to another which is according to the type and quality of service that is provided.

7.3.3.8 Service Quality

This is related to the citizen's point of view. It is regarding the quality of delivered mgovernment services. This includes the meaning of concept of "Service quality" to them and how important it is to them. Hence the service quality element is very important in the spread of m-government. For instance participant 5 (focus group 1) said:

"Yes, in my opinion I think that the quality is more important than the quantity. If each ministry provides a product with high quality, this will be better than providing 10 products of low quality or even with no quality at all".

From the other hand, some ministries do not perform the complete transaction, so that it might get interrupted in the middle of the processing which will affect the quality of the service. For example, participant 5 (focus group 2) said:

"Before, there was a weakness in provided m-government services, as you could stop in the middle of a transaction without being able to accomplish it because of the weak service quality. This means that the element of evaluation of time and production of mgovernment services was completely absent, as the aim of m-government providers was to increase the number of services against their quality".

As it can be seen from the above quotations, many participants linked the service quality to the accomplishment of the transaction without being interrupted. Other participants saw that the quantity of services was privileged compared to the quality,

7.3.4 Advantages

Under this point, respondents and participants were asked about the positive effects that m-government had on their life in general. They were also asked about other benefits regarding the achievement of their transactions with the government using this process. For instance, Participant 5 (focus group 2) said:

"In my opinion there are many benefits of m-government such as the quality of life in general. The other thing is preserving information in more trusted way, and I have confidence that the electronic usage is more trusted than the traditional form. Also returning to the transaction is much faster than the traditional method".

Also there are some advantages, such as what was mentioned by participant 3 (focus group 1) who said:

"There is a huge benefit, which is that you will be able to receive the service anytime 24/7, whether it is work time or not".

Finally, the advantages consist in saving the citizen time, money as well as effort, as it was expressed by participant 3 (focus group 2):

"Saving time, effort and money, for both citizen and government".

7.3.5 Disadvantages

Regarding the disadvantages that may occur following the implementation of mgovernment program, many questionnaire respondents expressed their concern about the increase in the rate of unemployment in Saudi Arabia. They believed that the transactions that are currently made by government employees that will be executed in a mobile way and which will make these employees redundant. Other respondents felt that many government jobs such as filling and archiving would be affected by the implemented m-government services. For instance, Participant 2 (focus group 2) said:

"One of the harms that will result from using m-government services will be increasing unemployment rate in the society, because the technology will replace humans".

This was confirmed by participant 6 (focus group 2) when he said:

"Yes, there will be a kind of unemployment, because we will be looking for a machine that can receive thousands of accurate transactions per minutes, unlike employees who can't do that".

CHAPTER SEVEN: QUALITATIVE DATA ANALYSIS

From what is said above, it can be concluded that the unemployment aspect is a real concern for many potential users, which will obstruct them from using m-government services.

Contrarily to the previous point, respondents and participants were asked here about the negative effects that m-government services had generated in their life. The obtained answers covered various areas. In addition to the technical, privacy and security sides, some participants expressed their concern about the health aspect that might be negatively affected when m-government services were used by citizens to accomplish their transactions, instead of the traditional way.

For example, participant 3 (focus group 2) said:

"I think that there are things such as fears and not harms, as some people use the same user name and the same password for all their electronic transactions or bank transactions. That is why the person might not desire to use m-government".

Furthermore, there are some problems that might affect the citizens' health. For instance participant 4 (focus group 1) said:

"Here is another digression because of a specialization. As we can see, such an application affects the lifestyles as the citizens do not do any physical activites.In the traditional way, such a person does not travel to the service provider. This is more problematic for persons who are not working, as this could increase the percentage of obesity because of the lack of physical activity".

From another side, there are some problems that are related to the security and protection issue. Hence, participant 1 (focus group 2) said:

"yes, there might be some hacking and weakness in the level of security and privacy, unlike the traditional way".

From what was said above, it is clear that m-government has not only provided advantages for its citizens, it may also potential carry some risks. The main one is the security aspect that was mentioned by some respondents, as there is a risk of hacking personal data, especially if the user name and passwords.

7.3.6 Suggestions

In order to enable m-government services to be used by a larger category of people in the country, many participants and respondents suggested improvements, including:

1) A full implementation of the technical infrastructure of m-government in order to link organisations with each other.
2) Adopting and learning from other countries success in the m-government experience.
3) Awareness of public about the importance and usefulness of m-government services.
4) Encouraging the public to use m-government services via incentives.
5) Educating the public to improve ICT skills, mainly via Computer and Internet courses.
6) A continuous support for the public regarding the use of m-government services (technical, educational and informative).
7) Developing laws for privacy and security protection.
8) Design of m-government application that takes into consideration the cultural differences in society.
9) Ensuring the quality of provided services via cooperation with private sector in the management of m-government application.
10) Hence the important suggestions made by participants reflect the needs in the provision of m-government services which should be seriously addressed, especially those related to technical infrastructure and awareness.

7.4 Summary

This chapter discussed and analyzed the data collected by qualitative methods. Even though the "supply-side" of m-government services is not the main concern of this research, interviewees accounted numerous difficulties confronting m-government implementation in Saudi Arabia. In accordance with m-government officials within Saudi Arabia, the key challenges include change management, legal issues and technical issues. Other issues are like lack of support, collaboration issues and lack of

practical step to implement m-government projects. On the other hand, the participants in focus group and open ended question identified several factors influencing citizen's acceptance of m-governments services within Saudi Arabia. These factors are trust, ease of use, usefulness, citizens' satisfaction, citizens' awareness, digital divide and service quality.

8 Chapter Eight: QUANTITATIVE DATA ANALYSIS

8.1 Introduction

This chapter describes the first stage of my data analysis and presents my structural equation modeling. The aim of this analysis is to provide a description of the basic features of the sample data. This research has used 695 survey responses, each with 51 measurements. A statistical analysis organises and summarises large data sets in a smaller number of meaningful statistical indicators (Janssens et al., 2008). This is achieved here by describing and discussing the following: (1) the demographic profile of the participants' gender; (2) the demographic profile of the participants' age; (3) the demographic profile of the participants' major; (4) The demographic profile of the participants' educational level; (5) their mobile usage time. The first 8 questions were about socio-demographic characteristics such as age, gender, educational level and occupation status. This chapter also examines the outlier cases and normality on the data prior to progressing to Structural Equation Modeling (SEM). The main goal of it is to provide validity to the hypothesized models and put forward the results of various theories. Its higher level goal is to decipher the most important points related to the acceptance of m-government services by the general public. The AMOS 23 software has been used for verification of measurement and structural models. The validation process has been performed by confirmatory factor analysis, in which the total fit of the measurement model is evaluated and finally the discriminant and convergent validity of the model constructs are stated. The causal association between hypothetic constructs is analysed and the facts related to the proposed premise are put forward.

8.2 Descriptive Statistics

In the first section of the questionnaire, respondents were asked to provide their demographic information. The description of the results is provided in the following subsection:

8.2.1 Gender

The sample consists of 62.9% males and 37.1 % females as shown in the Table 8.1.

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Gender				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Male	437	62.9	62.9	62.9
Female	258	37.1	37.1	100.0
Total	695	100.0	100.0	

Table 8.1: Gender Distribution of the sample.

8.2.2 Age

The age distribution is shown in Table 8.2. Figure 8.1 illustrates each age group within both genders.

Age	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
18-20	302	43.5	43.5	43.5
21-23	206	29.6	29.6	73.1
24-26	95	13.7	13.7	86.8
27-30	22	3.2	3.2	89.9
31-35	24	3.5	3.5	93.4
From 36 and above	46	6.6	6.6	100.0
Total	695	100.0	100.0	

Table 8.2: Age Distribution of the sample

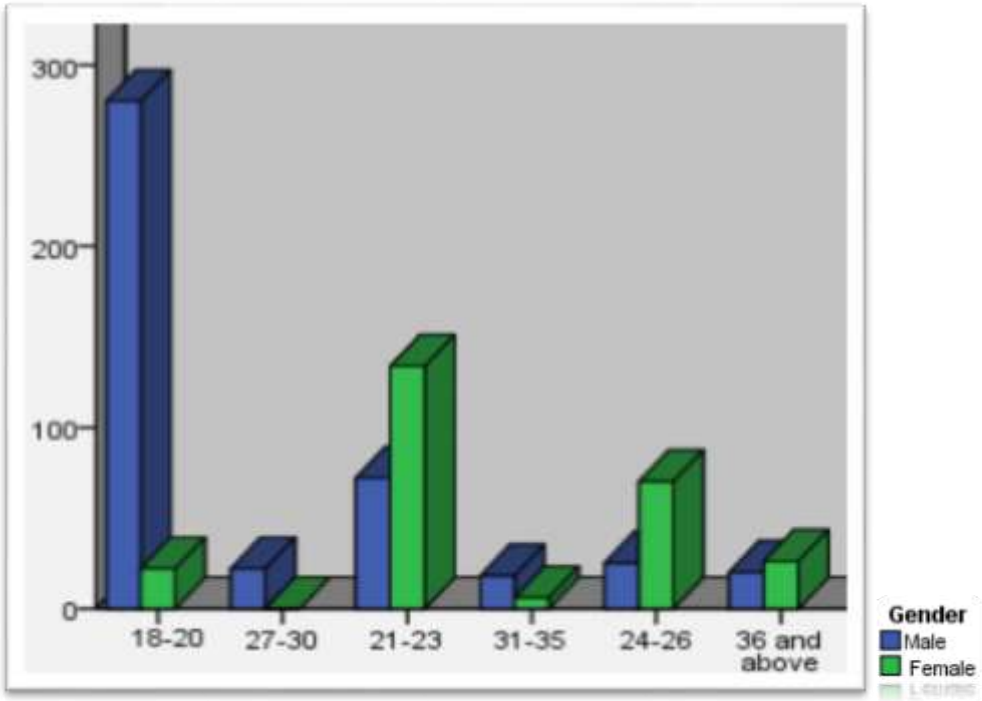

Figure 8.1: The gender and age distribution

8.2.3 Major/Specialty

The distribution by major/specialty is provided in Table 8.3. Figure 8.2 illustrates each age group within both genders.

The college	Frequency	Percent	Valid Percent	Cumulative Percent
College of Education	46	6.6	6.6	89.8
College of Pharmacy	50	7.2	7.2	33.8
College of Engineering	64	9.2	9.2	43
College of Applied Health Sciences	69	9.9	9.9	83.2
College of Business Administration	71	10.2	10.2	100
College of Dentistry	72	10.4	10.4	53.4
College of Medicines	92	13.2	13.2	66.6
College of Science	139	20	20	20
Total	695	100	100	

Table 8.3: Distribution of Type of the College

Chapter Eight: QUANTITATIVE DATA ANALYSIS

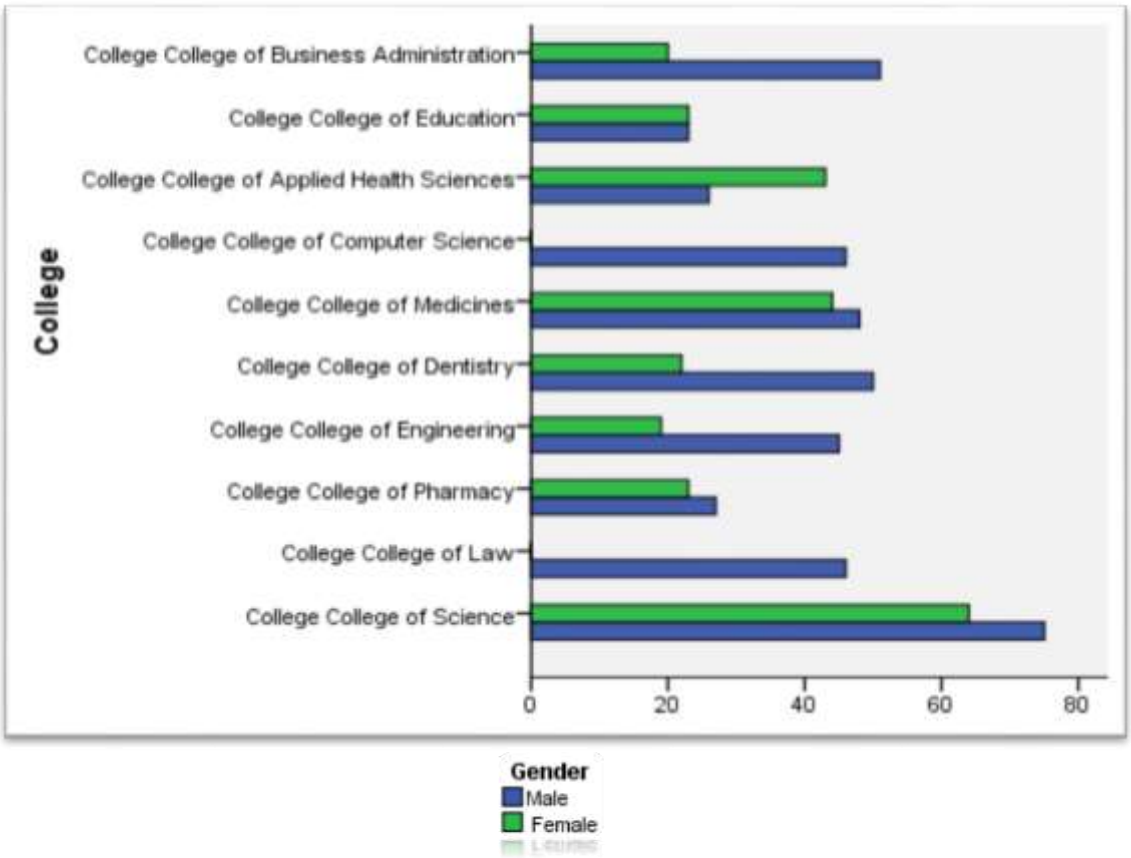

Figure 8.2: the gender and College distribution

8.2.4 Educational level

In addition, the distribution of the different level of education is provided in Table 8.4. Figure 8.3 illustrates each age group within both genders

Educational level				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Secondary	22	3.2	3.2	3.2
Undergraduate degree	160	23.0	23.0	26.2
High school	416	59.9	59.9	86.0
Postgraduate degree	97	14.0	14.0	100.0
Total	695	100.0	100.0	

Table 8.4: Distribution of Level of education

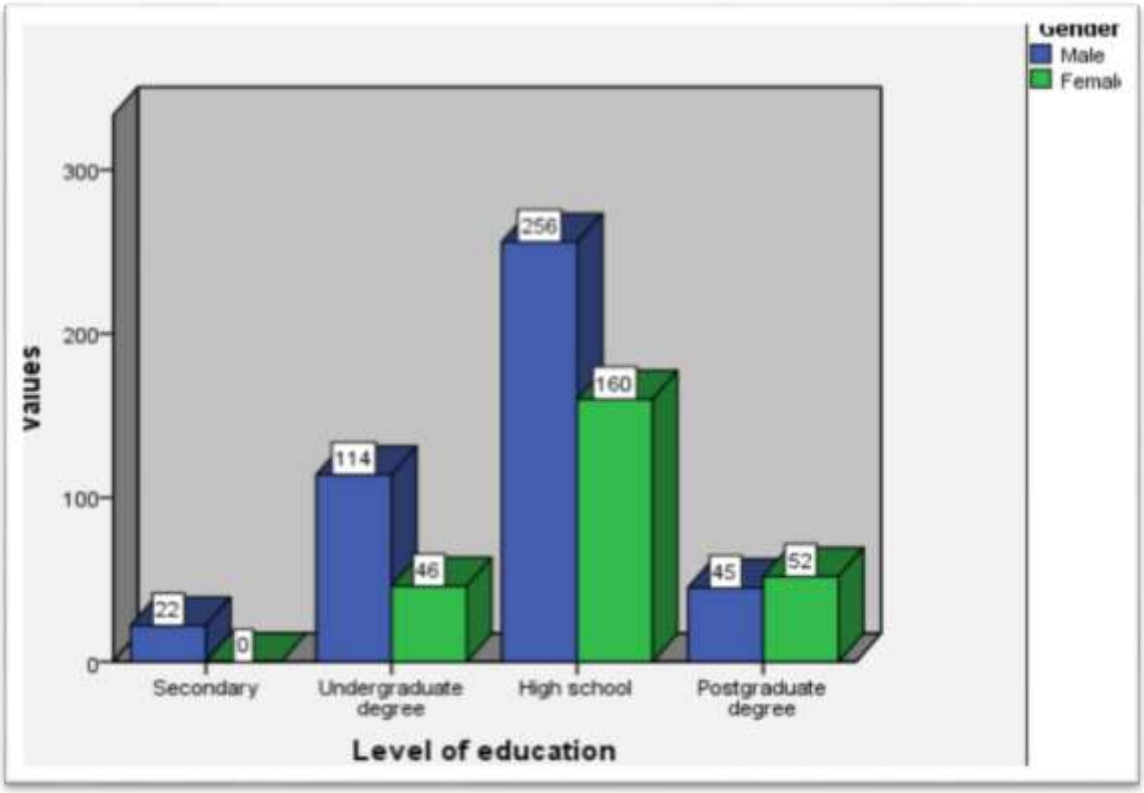

Figure 8.3: the gender and Level of education

8.2.5 The usage of mobile

In addition, the following Table 8.5 captures the frequency distribution of mobile phone usage in the sample.

How often do you use mobile				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Daily	674	97	97	97
Two or three times a week	14	2	2	99
Two or three times a month	7	1	1	100
Total	695	100	100	

Table 8.5: Frequency of Mobile usage

Also, the sample respondents use mobile phones for different purposes, as can be seen from Figure 8.4.

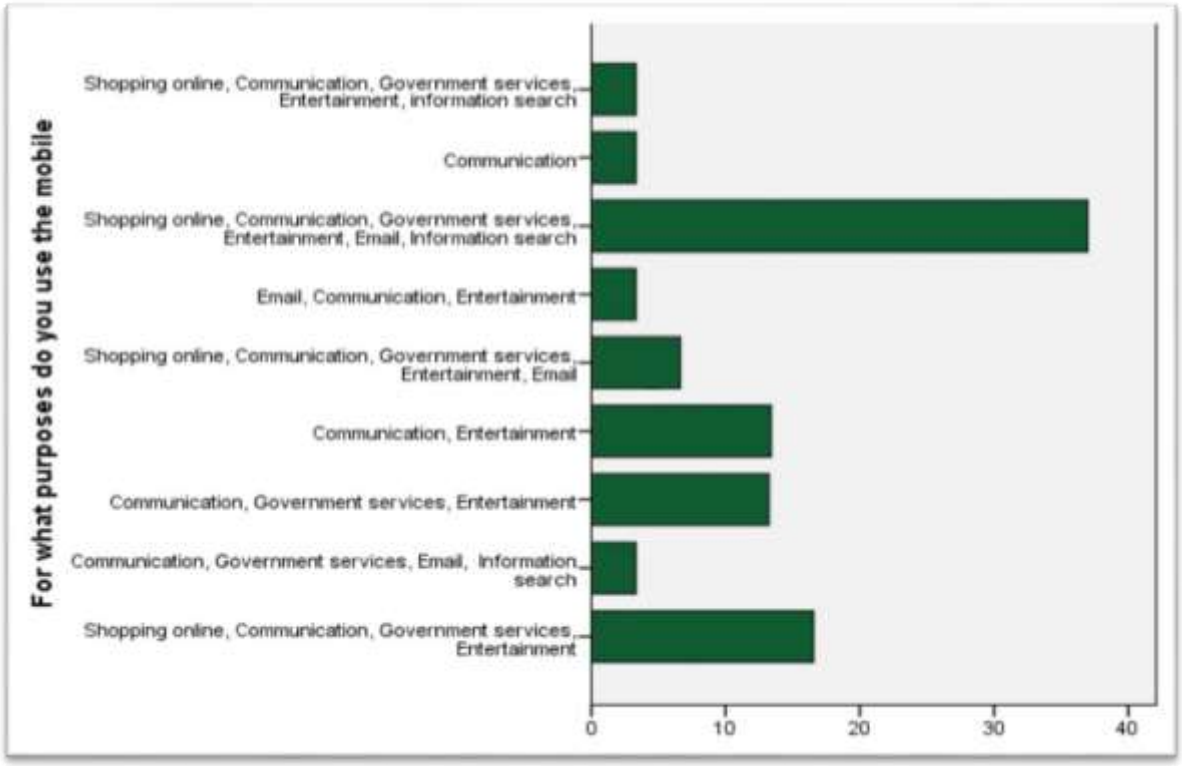

Figure 8.4: the purpose of using mobile

8.3 Examination of Data

8.3.1 Handling process of the missing data

In the examination of the responses received, 695 responses were found to be useful (86.8% of total questionnaire), and 105 were discarded because of incomplete questionnaires. This proportion is considered acceptable in the current practice (Mangione, 1995).

8.3.2 Outlier Detection

Before conducting data analysis it is very important to use outlier detection. Outliers are cases representing values that are substantially different (lower or higher) from all others in a particular data -set (Kline, 2011). It is a critical step which is used in order to validate the measurement model and present the structural equation modelling by eliminating the influence of outlier cases. Kline (2005) states that outliers are observations with values that is distinctly different from other responses in a collected

data. Cases that are identified as outliers have an impact on data analysis, which may affect statistical tests and hence alter the outcome of the results. A widely used technique to detect such data is by calculating the scores of standard deviation, which is a measure of the value around the mean. Cases with more than three standard deviations are considered as outliers (Field, 2005). The data analysis proved that there were no such defined outliers in my data set, as show in Table 8.6.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Usefulness	695	1.00	5.00	3.8072	.91274
Ease Of Use	695	1.00	5.00	3.9101	.97935
Mobility	695	1.00	5.00	4.2773	.65526
Responsiveness	695	1.00	5.00	3.7180	.92917
Reliability	695	1.00	5.00	3.8137	1.11343
Empathy	695	1.00	5.00	4.2090	.87066
Satisfaction	695	1.00	5.00	4.1000	.85075
Trust	695	1.00	5.00	3.8802	.98692
Attitude	695	1.00	5.00	3.9914	1.00077
Intention	695	1.00	5.00	4.2126	.81017
Actual use	695	1.00	5.00	4.1004	.95036

Table 8.6: Descriptive Statistics measuring variation of the factor average scores

8.3.3 The Normality

Normality is a vital and an essential assumption that requires prompt assessment and evaluation. The concept of normality implies that each single metric variable has a normal shaped data distribution.

The testing of the assumption for normality ideally includes certain statistics. Examples are the kurtosis as well as skewness along with visual inspection of histograms or normal

probability plots. The tests for skewness as well as kurtosis are employed appropriately for the univariate evaluation. The inapplicable testing of the normality in multivariate form was highlighted not just by Kline (2005) but also by Hair et al. (2006). Moreover, it is also observed that the size of a sample exhibits serious role for the normality promotion due to the presence and facts of a larger size of sample (Raykov and Marcoulides, 2006; Hair et al, 2006). Furthermore, certain issues of prompt and appropriate sample sizes have been discoursed in the methodology chapter and there has been adequate sample size of the study. In turn, the generation of strong analysis in statistics will be executed well according to its standard formation. Also, the skewness will result in the distribution shifts as positive skewness will ideally shift the distribution into the right base and that undesirable values will have reverse impact and influence. The test on kurtosis will determine the height of distribution in comparison to a normal distribution. According to Hair et al., (2006), the most commonly-used critical value of kurtosis and skewness test is [± 2.58]. Table 8.7 presents the results of the normality tests and assessment revealing that distributions of the variables are within standards both for the kurtosis and skewness prior to the recommended content and scope.

The Item	Skewness	Kurtosis	The Item	Skewness	Kurtosis	The Item	Skewness	Kurtosis
PU1	-0.751	0.287	**RL1**	-0.966	0.367	**EP4**	-1.000	0.647
PU2	-0.396	-0.528	**RL2**	-1.024	0.433	**AT1**	-1.102	0.645
PU3	-0.503	-0.709	**RL3**	-0.902	0.022	**AT2**	-0.928	0.308
PU4	-0.473	-0.910	**RL4**	-0.897	-0.016	**AT3**	-1.666	2.420
PEOU1	-1.021	0.583	**PM1**	-1.336	2.339	**AT4**	-0.842	0.568
PEOU2	-1.032	0.596	**PM2**	-0.990	1.184	**IN1**	-0.934	0.568
PEOU3	-0.774	-0.028	**PM3**	-1.073	1.956	**IN2**	-0.932	1.009
PEOU4	-0.848	0.104	**PM4**	-0.952	1.234	**IN3**	-1.014	0.629
TR1	-0.784	-0.231	**ST1**	-0.895	0.131	**IN4**	-0.980	0.368
TR2	-0.524	-0.757	**ST2**	-0.993	1.096	**AL1**	-1.283	1.250
TR3	-0.556	-0.621	**ST3**	-0.942	0.218	**AL2**	-1.360	1.603
TR4	-0.734	-0.523	**ST4**	-0.877	0.448	**AL3**	-1.684	2.500
RS1	-0.529	-0.567	**EP1**	-1.030	0.512	**AL4**	-1.281	1.144
RS2	-0.446	-0.172	**EP2**	-1.476	2.459			
RS3	-0.392	-2.49	**EP3**	-1.056	0.514			

Table 8.7 Normality Assessment

8.4 Data Analysis Technique

Data analysis involves several stages of validation from factor analysis to hypothesis testing. The purpose of establishing validation in research is to develop a rigorous instrument that is capable of presenting consistent and meaningful data. There is a need to build unity among concepts to eliminate confusion among the participants. Straub (1989) holds the view that more validation should be carried out by scholars in context of adopted instruments. The properties related to the measurement must be dealt with due care. Segars (1997) holds similar view and urges to build strong properties related to the measurement as the presumed interrelationship between the variables is impacted greatly by the results and consequently leads to an unsatisfactory research model. Reliability and construct validity are the two properties related to the measurement which must undergo analysis.

Factor analysis has to be taken up in the first stage by scholars (Boudreau *et al*., 2001). It is a technique used for analysing the interrelationship between the hypothetical constructs. The term *exploratory factor analysis* (EFA) is used when the aim of the research is to detect the interrelationship. The term *confirmatory factor analysis* (CFA) is used if the aim of the study is to provide confirmation of the prior structure of a given hypothesis (Boudreau *et al*., 2001). Thus, I am applying the process of confirmatory factor analysis (Boudreau *et al*., 2001) to my research because this research aims to confirm a pre-existing factor structure of a theory.

There are two approaches related to factor analysis which can be used to evaluate discriminant and convergent validity (Straub *et al.,* 2004; Hair *et al.*, 2006). The convergent validity refers to what extent two measures within a factor are correlated. Discriminant validity refers to what extent two similar factors are unique (Hair et al., 2006). Thus, I am also estimating the discriminant convergent validity (Hair *et al.*, 2006) to discard the items that do not converge properly from the further analysis (Gefen and Straub, 2005).

Reliability is another important concept that must be considered. According to Straub (1989), reliability deals with the stability of construct measures whenever the same sample of respondents is tapped for data collection. The distinguishing features between

validity and reliability are put forward by Hair *et al.* (2006). According to them, reliability lays stress on the consistency of measures and it does not give too much stress on the manner in which measures are used to define constructs. Straub *et al.* (2004) noted that the method of internal consistency is frequently used to evaluate the reliability of constructs. Thus, this research used internal consistency or Cronbach's alpha to evaluate instrument reliability (Boudreau *et al*. 2001).

The hypothesis put forward is tested in the second stage. In this stage, the relationships between constructs are evaluated by using various methods like regression techniques. Research conducted by Field (2000) has demonstrated that the interrelationship between the outcome (dependent variables) and predicator (independent variable) is analyzed and simulated by simple linear regression. If the impact of various independent variables on the dependent variable is to be analysed then multiple regressions is the most suitable method (Field, 2000). Multiple regression analysis has been used in various research studies to provide support to the significant impact of the theory (Belanger and Carter, 2005; Schaupp and Carter, 2005; Wu and Chen, 2005; Yang, 2005).

The regression methods have the ability to demonstrate the total effect exerted on the dependent variable. By determining the value of R^2 it can depict the percentage of variance in dependent variable and can also provide description of the impact of the result. According to Field (2000), R- square is the amount derived after adding squares of all correlations between dependent and independent variables. The ability of the independent variables to correctly represent what they are supposed to represent is denoted by this value. If the value of R-square is high then it can explain the larger predictions of variance in dependent variable. A value of 0.80 implies that the model has the ability to provide an explanation for 80% of the results; the remaining 20% can be attributed to variables which are not a part of the research (Field, 2000).

The study model has put forward a deal with a member of causal relationships for greater than one structured layer. For this variety of arrangement, a number of regression analyses have to be carried out encompassing multiple tests. The techniques commonly used include ANOVA, MANOVA and LOGIT. The term first generation statistical method is used for these tests (Boudreau *et al.,* 2001). Such methods do not have the capability of conducting factor analysis in a given test. The Structural Equation Model (SEM) comes under second generation statistical methods.

According to Boudreau *et al.,* (2001), the SEM has the ability to combine structural and measurement models within a single analysis. This is not possible in first generation methods. In the measurement model evaluation of item loading, it is anticipated that it

will come together on the suggested constructs. In a structural model, the hypothesis put forward is analyzed in context of a number of dependent and independent constructs and then it is determined to find the total fit of the model. According to Gefen *et al.* (2000), by virtue of this distinctive feature, the researchers can detect inaccuracies in measurements and also allows for factor analysis within a given exercise leading to more in- depth evaluation. Also, SEM can predict item loading as per prior explicit determination (Gefen & Straub, 2005)

Boudreau *et al.* (2001) has stated that the most frequent use of SEM is in the empirical research. Several software packages can be used to conduct SEM, including AMOS, LISREL, EQS and PLS- graph. AMOS 23 is a software that is used in combination with SPSS in this research.

8.4.1 Fit Indices Used in the Study

I used the following indices: RMSEA, SRMR, CMIN/DF, IFI, TLI and CFI, As show in In Table 9.1 they are acceptable according to current standards (Hair *et al.*, 2006).

Number	Fit Measure	Recommended Cut-off Value
1	**CMIN/DF**	greater than or equal to 1.0 and less than or equal to 5.0
2	**CFI**	Greater than or equal to 0.90
3	**RMSEA**	Greater than 0.05 for good fit or .05-.08 for adequate fit
4	**SRMR**	Greater than 0.10
5	**TLI**	Greater than or equal to 0.90
6	**IFI**	Greater than or equal to 0.90

Table 9.1: Goodness-of-fit measures

8.5 Measurement Model (with all constructs)

I used AMOS 23 to carry out CFA to conduct evaluation of the measurement model. Hair *et al.* (2006) recommendations were adopted to achieve this objective. In the initial stage, the total fit of the measurement model was evaluated. Thus, the fit of the model was deemed to be good and acceptable because the SRMR was found to be 0.0367, which is normally acceptable, so are the TLI (0.948) and CFI (0.948). The value of RMSEA was 0.053 indicating that the model had a good fit. The value of CMIN/DF was acceptable (2.940) (Hair *et al.* 2006). Similarly, all latent variables were subjected to the measurement model leading to determination of values of discriminant and convergent validity. The total fit indices for measurement models in the context of all the constructs can be viewed from Table 9.2. The measurement model demonstrated a

good fit for all the indices with regards to all the constructs. Values of critical ratios (C.R.), path loadings and R square values for measurement model can be seen in table 9.25. All the values of critical ratios (C.R.) were greater than 1.96 in all cases and the standardized regression weight values were greater than 0.5, which is normally considered acceptable (Janssens *et al.*, 2008).

Model	RMSEA	CMIN/DF	SRMR	CFI	TLI	IFI
Default model	0.053	2.940	0.0367	0.954	0.948	0.954
Saturated model				1.000		1.000
Independence model	0.232	38.434	0.000	0.000	0.000	0.000

Table 9.2: Overall fit indices of measurement model.

Structural Relation	Regression Weights	Standard Error (S.E.)	Critical Ratio (C.R.)	Standardized Regression Weights	Squared Multiple Correlation (SMC)
RL2 ← RL	1.000			0.989	0.977
RL3 ← RL	0.950	0.018	53.098	0.917	0.840
RL1 ← RL	0.903	0.017	53.959	0.919	0.845
RL4 ← RL	0.951	0.021	44.273	0.879	0.772
PM3 ← PM	1.000			0.925	0.856
PM4 ← PM	0.731	0.037	19.589	0.659	0.434
PM1 ← PM	0.898	0.031	28.821	0.869	0.755
PM2 ← PM	0.797	0.036	22.308	0.720	0.518
PEOU2 ← PEOU	1.000			0.947	0.898
PEOU1 ← PEOU	0.968	0.025	38.228	0.881	0.777
PEOU4 ← PEOU	0.978	0.024	41.436	0.904	0.817
PEOU3 ← PEOU	0.909	0.027	33.704	0.841	0.707
IN4 ← IN	1.000			0.958	0.918
IN2 ← IN	0.893	0.024	37.487	0.916	0.840
IN3 ← IN	0.948	0.018	53.248	0.942	0.887
IN1 ← IN	0.928	0.019	48.452	0.921	0.848
AL2 ← AL	1.000			0.974	0.948
AL1 ← AL	0.900	0.025	36.558	0.849	0.720
AL4 ← AL	0.978	0.021	45.501	0.913	0.833
AL3 ← AL	0.730	0.029	25.309	0.720	0.518
AT2 ← AT	1.000			0.978	0.957
AT4 ← AT	0.962	0.017	57.046	0.950	0.902
AT3 ← AT	0.753	0.023	33.218	0.808	0.653
AT1 ← AT	0.857	0.024	36.464	0.837	0.700
EP3 ← EP	1.000			0.998	0.995

EP4 ←	**EP**	0.889	0.016	55.487	0.914	0.836
Structural Relation		**Regression Weights**	**Standard Error (S.E.)**	**Critical Ratio (C.R.)**	**Standardized Regression Weights**	**Squared Multiple Correlation (SMC)**
EP1 ←	**EP**	0.889	0.018	49.245	0.892	0.796
EP2 ←	**EP**	0.838	0.014	60.255	0.928	0.860
PU4 ←	**PU**	1.000			0.884	0.782
PU1 ←	**PU**	0.922	0.029	32.115	0.858	0.737
PU3 ←	**PU**	0.988	0.028	35.126	0.922	0.851
PU2 ←	**PU**	0.864	0.027	31.973	0.885	0.783
TR4 ←	**TR**	1.000			0.960	0.921
TR3 ←	**TR**	0.904	0.023	39.348	0.882	0.777
TR2 ←	**TR**	0.802	0.029	27.750	0.764	0.584
TR1 ←	**TR**	0.972	0.023	42.289	0.904	0.817
ST3 ←	**ST**	1.000			0.982	0.965
ST2 ←	**ST**	0.827	0.017	50.049	0.905	0.819
ST4 ←	**ST**	0.910	0.014	63.093	0.945	0.892
ST1 ←	**ST**	0.959	0.015	62.722	0.943	0.890
RS1 ←	**RS**	1.000			0.874	0.765
RS3 ←	**RS**	0.918	0.022	41.371	0.935	0.875
RS2 ←	**RS**	0.851	0.023	36.952	0.889	0.791

Table 9.3: Estimated values of the measurement model items.

8.5.1 Reliability Analysis

Hair et al., (2006) introduced reliability as "An assessment of the degree of consistency between multiple measurements of a variable". Similarly, Hair *et al*; (2006) has also said that any survey tool can be said to be reliable if precise results are produced when that tool is used more than once.

In this research, I used the composite reliability method in Table 9.4 and Cronbach's alpha in Table 9.5 to evaluate the scale's reliability. The minimum value of composite reliability should be more than 0.70 for every single factor or construct in the research model (Bagozzi and Yi, 1988). The equation which was put forward by Fornell and Lorcker (1981) can be used to determine this. The minimum value of Cronbach's alpha is 0.70 (Hair *et al*., 2006).

Construct	Standardized Regression Weights	Squared Multiple Correlation	1 - Squared Multiple Correlation	Construct Reliability
RL2 ← RL	0.989	0.977	0.023	13.720 / (13.720 + 0.566) =
RL3 ← RL	0.917	0.84	0.160	**0.960**
RL1 ← RL	0.919	0.845	0.155	
RL4 ← RL	0.879	0.772	0.228	
SUM Square	**3.704**	**SUM**	**0.566**	
SUM Square	**13.720**			
PM3 ← PM	0.925	0.856	0.144	10.068 / (10.068 + 1.437) =
PM4 ← PM	0.659	0.434	0.566	**0.875**
PM1 ← PM	0.869	0.755	0.245	
PM2 ← PM	0.72	0.518	0.482	
SUM Square	**3.173**	**SUM**	**1.437**	
SUM Square	**10.068**			
PEOU2 ← PEOU	0.947	0.898	0.102	12.766 / (12.766 + 0.801) =
PEOU1 ← PEOU	0.881	0.777	0.223	**0.941**

PEOU4 ← PEOU		0.904	0.817	0.183	
PEOU3 ← PEOU		0.841	0.707	0.293	
SUM Square		**3.573**	**SUM**	**0.801**	
SUM Square		**12.766**			
IN4 ← IN		0.958	0.918	0.082	13.965 / (13.965 + 0.507) =

IN2 ← IN		0.916	0.84	0.16	**0.965**
IN3 ← IN		0.942	0.887	0.113	
IN1 ← IN		0.921	0.848	0.152	
SUM Square		**3.737**	**SUM**	**0.507**	
SUM Square		**13.965**			
AL2 ← AL		0.974	0.948	0.052	11.944 / (11.944 + 0.981) =
AL1 ← AL		0.849	0.72	0.280	**0.924**
AL4 ← AL		0.913	0.833	0.167	
AL3 ← AL		0.72	0.518	0.482	
SUM Square		**3.456**	**SUM**	**0.981**	
SUM Square		**11.944**			
AT2 ← AT		0.978	0.957	0.043	12.766 / (12.766 + 0.788) =
AT4 ← AT		0.95	0.902	0.098	**0.942**

AT3 ←	AT	0.808	0.653	0.347	
AT1 ←	AT	0.837	0.7	0.3	
SUM Square		**3.573**	**SUM**	**0.788**	
SUM Square		**12.766**			
EP3 ←	EP	0.998	0.995	0.005	13.928 / (13.928 + 0.513) =
EP4 ←	EP	0.914	0.836	0.164	**0.964**
EP1 ←	EP	0.892	0.796	0.204	
EP2 ←	EP	0.928	0.86	0.14	
SUM Square		**3.732**	**SUM**	**0.513**	
SUM Square		**13.928**			
PU4 ←	PU	0.884	0.782	0.218	12.595 / (12.595 + 0.847) =
PU1 ←	PU	0.858	0.737	0.263	**0.937**

PU3 ←	PU	0.922	0.851	0.149	
PU2 ←	PU	0.885	0.783	0.217	
SUM Square		**3.549**	**SUM**	**0.847**	
SUM Square		**12.595**			
TR4 ←	TR	0.96	0.921	0.079	12.320 / (12.320 + 0.901) =
TR3 ←	TR	0.882	0.777	0.223	**0.932**

TR2 ←	TR	0.764	0.584	0.416	
TR1 ←	TR	0.904	0.817	0.183	
SUM Square		**3.51**	**SUM**	**0.901**	
SUM Square		**12.320**			
ST3 ←	ST	0.982	0.965	0.035	14.251 / (14.251 + 0.434) =
ST2 ←	ST	0.905	0.819	0.181	**0.970**
ST4 ←	ST	0.945	0.892	0.108	
ST1 ←	ST	0.943	0.89	0.11	
SUM Square		**3.775**	**SUM**	**0.434**	
SUM Square		**14.251**			
RS1 ←	RS	0.874	0.765	0.235	7.279 / (7.279 + 0.569) =
RS3 ←	RS	0.935	0.875	0.125	**0.927**
RS2 ←	RS	0.889	0.791	0.209	
SUM Square		**2.698**	**SUM**	**0.569**	
SUM Square		**7.279**			

Table 9.4: Construct Reliability

Constructs	Number of items	Cronbach's Alpha (α)
Perceived usefulness	4	0.930
Perceived ease of use	4	0.943
Perceived mobility	4	0.890
Perceived responsiveness	3	0.918
Perceived reliability	4	0.963
Perceived empathy	4	0.967
Satisfaction	4	0.972
Perceived trustworthiness	4	0.938
Attitude towards use of mobile government services	4	0.951
Intention to use mobile government services	4	0.960
Actual use of mobile government services	4	0.928
The overall of reliability coefficient	43	0.902

Table 9.5: The reliability of the study

8.5.2 Validity analysis

According to Maitland and Hannah (2008), the degree to which a tool actually represents or correctly estimates what it is expected to be estimated or determined, is called *validity*. The subsections below discusses content and construct (discriminant and convergent) validity

8.5.2.1 Content validity

Maitland and Hannah (2008) introduce validity as "a measure of the extent to which the content of the test measures all of the knowledge or skills that are supposed to be included within the domain being tested, according to expert judges".

Given that most of the Saudi Arabian are conveying in Arabic Language, questionnaire items of the main study has been translated into Arabic Language. After that, the instrument was pre-tried with three scholar (lecturers) in the field of Information Systems (IS) at King Saud University and three students who were in the field of IS at Strathclyde University. All those people were asked to finish the questionnaire. When they completed it, they were asked if they found any issues while comprehending the study questions. Based on their feedback, the wording of questions was revised and all the changes were done in Arabic version

8.5.2.2 Construct Validity

Construct validity is defined as the real measure of precision. This is a reflection of the degree to which a test is actually able to determine the value of the hypothetical factor that it is supposed to measure (Maitland & Hannah, 2008).

In this research every measurement scale was subjected to test the discriminant and convergent validity, so that the construct validity of the scales could be laid down. ✞

Convergent validity

As per Hair *et al*., (2006: p.771), convergent validity is the degree to which indicators pertaining to a fixed construct demonstrate convergence or displays large amount of variance.

In this research, the following method was used to evaluate convergent validity: standardized regression coefficient's value should exceed 0.50 and the average variance is extracted (AVE) which indicates the total variance present in the indicators, as shown by latent construct. So, the higher the value of AVE, the higher is the possibility that items are actually representing latent construct. The value of average variance extracted (AVE) should be a minimum of 0.50 to enable it to support convergent validity.

Construct	**Squared Multiple Correlation (SMC)**	**ΣR^2**	**Average variance extracted (AVE)**
Reliability (RL)			
RL2	0.977		
RL3	0.840		
RL1	0.845		
RL4	0.772	**3.434**	**0.859**

Perceived Mobility (PM)			
PM3	0.856	**2.563**	**0.641**
PM4	0.550		
PM1	0.755		
PM2	0.518		
Perceived Ease of Use (PEOU)			
PEOU2	0.898	**3.199**	**0.800**
PEOU1	0.777		
PEOU4	0.817		
PEOU3	0.707		
Behavioral Intention to Use (IN)			
IN4	0.918	**3.493**	**0.873**
IN2	0.840		
IN3	0.887		
IN1	0.848		
Actual Use (AL)			
AL2	0.948	**3.019**	**0.755**
AL1	0.720		
AL4	0.833		
AL3	0.518		
Attitude towards Using (AT)			
AT2	0.957	**3.212**	**0.803**
AT4	0.902		
AT3	0.653		
AT1	0.700		
Empathy (EP)			
EP3	0.995	**3.487**	**0.872**
EP4	0.836		
EP1	0.796		

EP2	0.860		
Perceived Usefulness (PU)			
PU4	0.782	**3.153**	**0.788**
PU1	0.737		
PU3	0.851		
PU2	0.783		
Perceived Trustworthiness (TR)			
TR4	0.921	**3.099**	**0.775**
TR3	0.777		
TR2	0.584		
TR1	0.817		
Citizen Satisfaction (ST)			
ST3	0.965	**3.566**	**0.892**
ST2	0.819		
ST4	0.892		
ST1	0.890		
Responsiveness (RS)			
RS1	0.765	**2.431**	**0.810**
RS3	0.875		
RS2	0.791		

Table 9.6: Average variance extracted (AVE) for all constructs

✞ **Discriminant validity**

As per Hair *et al*., (2006:p.71), discriminant validity measures the degree of differentiation which makes a construct stand out from the other constructs.

In this research, the squared correlation and the values of average variance extracted (AVE) of 2 constructs were compared to evaluate the discriminant validity. The value of average variance extracted (AVE) from both the constructs should be higher than the squared correlation between the two constructs.

Construct	ST	RL	PM	PEOU	IN	AL	AT	EP	PU	TR	RS
ST	**0.944**										
RL	0.176	**0.927**									
PM	0.199	0.092	**0.801**								
PEOU	0.060	0.100	0.135	**0.894**							
IN	0.262	0.189	0.352	0.244	**0.934**						
AL	0.285	0.142	0.264	0.000	0.286	**0.869**					
AT	-0.012	0.027	0.056	0.110	0.134	-0.080	**0.896**				
EP	0.090	0.053	0.116	0.062	0.043	0.025	-0.065	**0.934**			
PU	0.287	0.329	0.276	0.438	0.435	0.187	0.071	0.115	**0.888**		
TR	0.164	0.292	0.167	0.117	0.372	0.203	-0.002	0.006	0.338	**0.880**	
RS	0.159	0.196	0.210	0.141	0.400	0.175	0.065	0.081	0.211	0.193	**0.900**

Table 9.7: Discriminant validity of all constructs in the research model.

8.6 The structural model

Once the validation of the measurement model is established, one can proceed to test and validate the structural model. The fit of model was deemed to be acceptable because the SRMR was found to be 0.0893, so are the TLI (0.941) and CFI (0.946). The value of RMSEA was 0.056 indicating that the model had a good fit. The value of CMIN/DF was acceptable (3.203) (Hair *et al.* 2006). The total fit indices for structural model in context of all constructs can be seen in Table 9.8.

The structural model demonstrated a good fit for all indices with regards to all constructs. Values of critical ratios (C.R.), path loadings and R square values for measurement model can be seen in table 9.31.

All the values of critical ratios (C.R.) were greater than 1.96 in all cases and the standardized regression weight values were greater than 0.5, which is normally considered acceptable (Janssens *et al.*, 2008). In summary, of the sixteen designed casual relationships in the structural model, ten path relationships (R→ST, ER→ST, ST→AL, IN→AL, PM→IN, TR→IN, TR→IN, PEOU→AT, PEOU→IN and PEOU→PU) were revealed to be significant. The other two paths (EP→ST and PU→AT) are found to be unsupported.

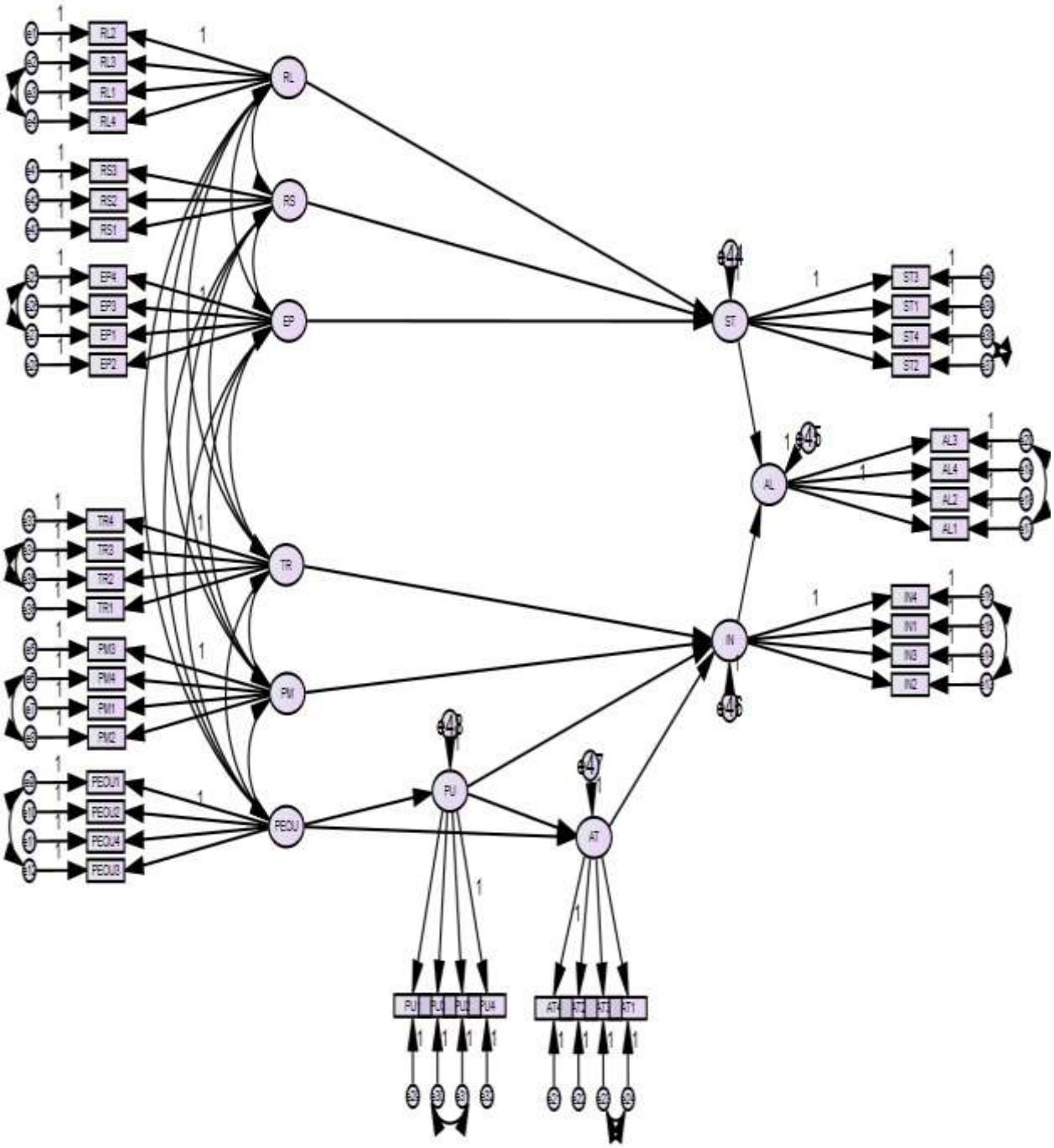

Figure 9.1: SEM of all the factors

Model	RMSEA	CMIN/DF	SRMR	CFI	TLI	IFI
Default model	0.056	3.203	0.0893	0.946	0.941	0.946
Saturated model				1.000		1.000
Independence model	0.232	38.434	0.000	0.000	0.000	0.000

Table 9.8: Overall fit indices of structural model

Structural Relation	Regression Weights	Standard Error (S.E.)	Critical Ratio (C.R.)	Standardized Regression Weights	Squared Multiple Correlation (R^2)
RL2 ← RL	1			0.989	0.979
RL3 ← RL	0.948	0.018	52.939	0.916	0.839
RL1 ← RL	0.902	0.017	53.843	0.919	0.844
RL4 ← RL	0.950	0.022	44.154	0.878	0.770
PM3 ← PM	1.000			0.924	0.854
PM4 ← PM	0.731	0.038	19.481	0.658	0.433
PM1 ← PM	0.899	0.032	28.498	0.870	0.756
PM2 ← PM	0.796	0.036	22.121	0.718	0.515
PEOU2 ← PEOU	1.000			0.947	0.898
PEOU1 ← PEOU	0.970	0.025	38.305	0.882	0.778
PEOU4 ← PEOU	0.976	0.024	41.140	0.902	0.813
PEOU3 ← PEOU	0.911	0.027	33.830	0.843	0.710
IN4 ← IN	1.000			0.955	0.913
IN2 ← IN	0.892	0.025	36.032	0.910	0.828
IN3 ← IN	0.948	0.019	51.095	0.938	0.880
IN1 ← IN	0.928	0.020	46.562	0.916	0.839
AL2 ← AL	1.000			0.972	0.946
AL1 ← AL	0.901	0.025	35.986	0.846	0.716
AL4 ← AL	0.978	0.022	44.477	0.911	0.830
AL3 ← AL	0.731	0.029	24.893	0.715	0.512
AT2 ← AT	1.000			0.977	0.954
AT4 ← AT	0.964	0.017	56.987	0.951	0.904
AT3 ← AT	0.754	0.023	33.206	0.808	0.653
AT1 ← AT	0.859	0.024	36.476	0.837	0.701
EP3 ← EP	1.000			0.998	0.996
EP4 ← EP	0.888	0.016	55.451	0.914	0.835
EP1 ← EP	0.888	0.018	49.201	0.892	0.795
EP2 ← EP	0.837	0.014	60.205	0.927	0.860
PU4 ← PU	1.000			0.881	0.776
PU1 ← PU	0.922	0.029	31.714	0.855	0.731
PU3 ← PU	0.995	0.029	34.510	0.925	0.856

PU2	← **PU**	0.873	0.028	31.718	0.890	0.793
TR4	← **TR**	1.000			0.961	0.923
TR3	← **TR**	0.902	0.023	39.228	0.881	0.775
TR2	← **TR**	0.800	0.029	27.657	0.762	0.581
TR1	← **TR**	0.970	0.023	42.146	0.903	0.816
ST3	← **ST**	1.000			0.982	0.965
ST2	← **ST**	0.827	0.017	50.092	0.905	0.819
ST4	← **ST**	0.910	0.014	63.098	0.945	0.892
ST1	← **ST**	0.958	0.015	62.532	0.943	0.888
RS1	← **RS**	1.000			0.861	0.741
RS3	← **RS**	0.943	0.028	33.340	0.936	0.877
RS2	← **RS**	0.867	0.028	30.977	0.882	0.777

Table 9.9: Estimated values of measurement model item

Structural Relation		**Regression Weights**	**Standard Error (S.E.)**	**Critical Ratio (C.R.)**	**P value**
Perceived Usefulness ←	Perceived Ease of Use	0.421	0.036	11.696	***
Attitude towards using ←	Perceived Usefulness	0.031	0.050	0.614	0.539
Attitude towards using ←	Perceived Ease of Use	0.107	0.048	2.217	0.027
Citizen Satisfaction ←	Reliability	0.118	0.031	3.841	***
Citizen Satisfaction ←	Responsiveness	0.118	0.038	3.112	0.002
Intention to use ←	Attitude towards using	0.081	0.026	3.125	0.002
Intention to use ←	Perceived Trustworthiness	0.200	0.028	7.146	***
Intention to use ←	Perceived Usefulness	0.260	0.030	8.524	***
Intention to use ←	Perceived Mobility	0.285	0.042	6.719	***
Citizen Satisfaction ←	Empathy	0.069	0.036	1.902	0.057
Actual use ←	Citizen Satisfaction	0.250	0.041	6.137	***
Actual use ←	Intention to use	0.268	0.045	5.996	***

Table 9.10: Path loadings and critical ratios within constructs in the structural model

(***=significanceat the 0.001 level, **=significance at the 0.01 level and *=significance at the 0.05 level)

8.7 Key findings of Demographic Variables

This subsection discusses the influence of demographic variables (gender, age and the level of education) on perceived ease of use, perceived usefulness, attitude, trustworthiness, perceived mobility, reliability, responsiveness, empathy, satisfaction, intention and actual use. In this research, there were 695 participants with 258 females (37 per cent) and 437 males (63 per cent). In the sample, there were six age groups. These groups were as follows: 1) 18-20 years comprising 43 per cent of the sample; 2) 21-23 years comprising 30 per cent of the sample; 3) 24-26 years comprising 14 per cent of the sample; 4) 27-30 years comprising 3 per cent of the sample; 5) 31-35 years comprising 4 per cent of the sample; and 6) from 36 years and above comprising 7 per cent of the sample . For easier analysis and readability, the sample was categorized into three age groups, lower age group (18-20), middle age group (21-25) and higher age group (26 and above). This categorization can assist in seeing how the relationships between different variables behave within each of these age groups.

There were four main levels of education groups. These groups were secondary (3 per cent), high school (60 per cent) (the highest percentage of the sample), undergraduate (23 per cent); and postgraduate (14 per cent). Again, for easier analysis and readability, these groups were categorized further into two groups; low level education group (high school or below) and high level education group (undergraduate level or high). The results and a discussion of the different variables and their influence on the actual use of mobile government services in terms of demographics for example, gender, age, and education are discussed below:

8.7.1 The Impact of Demographic Variables on proposed relation of Perceived Ease of Use (PEOU) and Perceived Usefulness (PU)

Data analysis results exposed that, in the case of male group, PEOU has significant positive impact on PU (Unstandardized β=0.406, Standardized β=0.425, P<0.001). Similarly, in the case of female group, PEOU has also significant positive impact on PU (Unstandardized β=0.448, Standardized β=0.470, P<0.001). The effect of PEOU on PU is slightly greater in the case of female as compare to male. In addition to it, in the case of lower age group, PEOU has significant positive impact on PU (Unstandardized

=0.333, Standardized =0.360, P<0.001). Similarly, in the case of middle age group, PEOU has also significant positive impact on PU (Unstandardized =0.611, Standardized =0.588, P<0.001). Correspondingly, in the case of higher age group, PEOU has significant positive impact on PU (Unstandardized =0.396, Standardized =0.450, P<0.001). The effect of PEOU on PU is very strong in the case of middle age group as compare to lower and higher age group. Moreover, in the case of low level education group, PEOU has significant positive impact on PU (Unstandardized =0.386, Standardized =0.408, P<0.001). Similarly, in the case of high level education group, PEOU has also significant positive impact on PU (Unstandardized =0.491, Standardized =0.500, P<0.001) as mentioned in Table 9.11. The effect of PEOU on PU is moderately greater in the case of high level education group as compare to low level education group.

Group	Unstandardized	Standardized	S.E.	P
Male	.406	.425	.045	***
Female	.448	.470	.060	ns
Lower Age	.333	.360	.053	***
Middle Age	.611	.588	.070	***
Higher Age	.396	.450	.063	***
Lower level Education	.386	.408	.045	***
Higher level Education	.491	.500	.059	***

Table 9.11: The impact of demographic variables on PEOU→PU.

Note: ns=not significant, *=p<0.05, ***=p<0.001.

8.7.2 The Impact of Demographic Variables on proposed relation of Perceived Usefulness (PU) and Attitude (AT)

Data analysis results exposed that, in the case of male group, PU has insignificant positive impact on AT (Unstandardized =0.065, Standardized =0.059, P>0.05). But, in the case of female group, PU has insignificant negative impact on AT (Unstandardized =-0.062, Standardized =-0.049, P>0.05). In addition to it, in the case of lower age group, PU has insignificant positive impact on AT (Unstandardized =0.063, Standardized =0.054, P>0.05). But, in the case of middle age group, PU has insignificant negative impact on AT (Unstandardized =-0.005, Standardized =-0.004, P>0.05). Correspondingly, in the case of higher age group, PU has also insignificant negative impact on AT (Unstandardized =-0.050, Standardized =-0.046, P>0.05).

Moreover, in the case of low level education group, PU has insignificant positive impact on AT

(Unstandardized β=0.033, Standardized β=0.029, P>0.05). Similarly, in the case of high level education group, PU has also insignificant positive impact on AT (Unstandardized β=0.031, Standardized β=0.027, P>0.05) as shown in Table 9.12.

The Group	Unstandardized β	Standardized β	S.E.	P
Male	.065	.059	.060	ns
Female	-.062	-.049	.093	ns
Lower Age	.063	.054	.072	ns
Middle Age	-.005	-.004	.120	ns
High Age	-.050	-.046	.092	ns
Low level Education	.033	.029	.062	ns
High level Education	.031	.027	.084	ns

Table 9.12: The impact of demographic variables on PU→AT

Note: ns=not significant, *=p<0.05, ***=p<0.001.

8.7.3 The Impact of Demographic Variables on proposed relation of Perceived Ease of Use (PEOU) and Attitude (AT)

Data analysis results exposed that, in the case of male group, PEOU has insignificant positive impact on AT (Unstandardized β=0.051, Standardized β=0.048, P>0.05). But shockingly, in the case of female group, PEOU has significant positive impact on AT (Unstandardized β=0.226, Standardized β=0.188, P<0.05). In addition to it, in the case of lower age group, PEOU has insignificant positive impact on AT (Unstandardized β=0.080, Standardized β=0.075, P>0.05). But, in the case of middle age group, PEOU has insignificant positive impact on AT (Unstandardized β=0.121, Standardized β=0.091, P>0.05). Surprisingly, in the case of higher age group, PEOU has significant positive impact on AT (Unstandardized β=0.172, Standardized β=0.178, P<0.05). Moreover, in the case of low level education group, PEOU has insignificant positive impact on AT (Unstandardized β=0.078, Standardized β=0.073, P>0.05). Similarly, in the case of high level education group, PEOU has also insignificant positive impact on AT (Unstandardized β=0.164, Standardized β=0.145, P>0.05) as mentioned in Table

9.13.

Group	Unstandardized □	Standardized □	S.E.	P
Male	.051	.048	.058	ns
Female	.226	.188	.089	*
Lower Age	.080	.075	.068	ns
Middle Age	.121	.091	.123	ns
High Age	.172	.178	.082	*
Low level Education	.078	.073	.059	ns
High level Education	.164	.145	.085	ns

Table 9.13: The impact of demographic variables on PEOU→AT

Note: ns=not significant, *=p<0.05, ***=p<0.001.

8.7.4 The Impact of Demographic Variables on proposed relation of Reliability (RL) and Satisfaction (ST)

Data analysis results exposed that, in the case of male group, RL has insignificant positive impact on ST (Unstandardized □=0.069, Standardized □=0.090, P>0.05). But again shockingly, in the case of female group, RL has significant positive impact on ST (Unstandardized □=0.220, Standardized □=0.260, P<0.001). In addition to it, in the case of lower age group, RL has insignificant positive impact on ST (Unstandardized □=0.018, Standardized □=0.024, P>0.05). But, in the case of middle age group, RL has significant positive impact on ST (Unstandardized □=0.134, Standardized □=0.182, P<0.01). Likewise, in the case of higher age group, RL has significant positive impact on ST (Unstandardized □=0.332, Standardized □=0.327, P<0.001). Moreover, in the case of low level education group, RL has significant positive impact on ST (Unstandardized □=0.115, Standardized □=0.149, P<0.01). Similarly, in the case of high level education group, RL has also significant positive impact on ST (Unstandardized □=0.126, Standardized □=0.152, P<0.05).

Group	Unstandardized β	Standardized β	S.E.	P
Male	.069	.090	.037	ns
Female	.082	.088	.060	ns
Lower Age	.018	.024	.045	ns
Middle Age	.134	.182	.050	**
High Age	.332	.327	.073	***
Low level Education	.115	.149	.038	ns
High level Education	.164	.145	.085	**

Table 9.14: The impact of demographic variables on RL→ST

Note: ns=not significant, *=p<0.05, ***=p<0.001.

8.7.5 The Impact of Demographic Variables on proposed relation of Responsiveness (RS) and Satisfaction (ST)

Data analysis results exposed that, in the case of male group, RS has significant positive impact on ST (Unstandardized β=0.138, Standardized β=0.143, P<0.01). But shockingly, in the case of female group, RS has insignificant positive impact on ST (Unstandardized β=0.082, Standardized β=0.088, P>0.05). In addition to it, in the case of lower age group, RS has significant positive impact on ST (Unstandardized β=0.141, Standardized β=0.154, P>0.05). But, in the case of middle age group, RS has insignificant positive impact on ST (Unstandardized β=0.144, Standardized β=-0.139, P>0.05). Likewise, in the case of higher age group, RS has insignificant positive impact on ST (Unstandardized β=0.047, Standardized β=0.050, P>0.05). Moreover, in the case of low level education group, RS has significant positive impact on ST (Unstandardized β=0.124, Standardized β=0.131, P<0.05). Conversely, in the case of high level education group, RS has also insignificant positive impact on ST (Unstandardized β=0.106, Standardized β=0.111, P>0.05) as mentioned in Table 9.15.

Group	Unstandardized β	Standardized β	S.E.	P
Male	.138	.143	.048	**
Female	.082	.088	.060	ns
Lower Age	.141	.154	.056	*
Middle Age	.144	.139	.074	ns
High Age	.047	.050	.071	ns
Low level Education	.124	.131	.048	*

High level Education	.106	.111	.062	ns

Table 9.15: The impact of demographic variables on RS→ST.

8.7.6 The Impact of Demographic Variables on proposed relation of Attitude (AT) and Intention (IN)

Data analysis results exposed that, in the case of male group, AT has insignificant positive impact on IN (Unstandardized =0.046, Standardized =0.060, P>0.05). But shockingly, in the case of female group, AT has significant positive impact on IN (Unstandardized =0.148, Standardized =0.192, P<0.001). In addition to it, in the case of lower age group, AT has insignificant positive impact on IN (Unstandardized =0.043, Standardized =0.052, P>0.05). Similarly, in the case of middle age group, AT has insignificant positive impact on IN (Unstandardized =0.053, Standardized =0.086, P>0.05). Likewise, in the case of higher age group, AT has significant positive impact on IN (Unstandardized =0.171, Standardized =0.201, P<0.001). Moreover, in the case of low level education group, AT has significant positive impact on IN (Unstandardized =0.074, Standardized =0.097, P<0.05). Contrarily, in the case of high level education group, AT has insignificant positive impact on IN (Unstandardized =0.080, Standardized =0.104, P>0.05) as shown in Table 9.16.

Group	Unstandardized	Standardized	S.E.	P
Male	.046	.060	.034	ns
Female	.148	.192	.039	***
Lower Age	.043	.052	.044	ns
Middle Age	.053	.086	.036	ns
High Age	.171	.201	.052	***
Low level Education	.074	.097	.032	*
High level Education	.080	.104	.044	ns

Table 9.16: The impact of demographic variables on AT→IN

Note: ns=not significant, *=p<0.05, ***=p<0.001.

8.7.7 The Impact of Demographic Variables on proposed relation of Trustworthiness (TR) and Intention (IN)

Data analysis results exposed that, in the case of male group, TR has significant positive impact on IN (Unstandardized =0.172, Standardized =0.211, P<0.001). Similarly, in the case of female group, TR has significant positive impact on IN (Unstandardized =0.247, Standardized =0.316, P<0.001). In addition to it, in the case of lower age

group, TR has significant positive impact on IN (Unstandardized β=0.132, Standardized β=0.158, P<0.01). Similarly, in the case of middle age group, TR has significant positive impact on IN (Unstandardized β=0.223, Standardized β=0.336, P<0.001). Likewise, in the case of higher age group, TR has significant positive impact on IN (Unstandardized β=0.286, Standardized β=0.317, P<0.001). Moreover, in the case of low level education group, TR has significant positive impact on IN (Unstandardized β=0.180, Standardized β=0.236, P<0.001). Correspondingly, in the case of high level education group, TR has significant positive impact on IN (Unstandardized β=0.239, Standardized β=0.271, P<0.001) as shown in Table 9.17.

Group	Unstandardized β	Standardized β	S.E.	P
Male	.172	.211	.036	***
Female	.247	.316	.042	***
Lower Age	.132	.158	.046	**
Middle Age	.223	.336	.039	***
High Age	.286	.317	.058	***
Low level Education	.180	.236	.033	***
High level Education	.239	.271	.052	***

Table 9.17: The impact of demographic variables on TR→IN

Note: ns=not significant, *=p<0.05, ***=p<0.001.

The Impact of Demographic Variables on proposed relation of Perceived Mobility (PM) and Intention (IN):

Data analysis results exposed that, in the case of male group, PM has significant positive impact on IN (Unstandardized β=0.230, Standardized β=0.187, P<0.001). Similarly, in the case of female group, PM has significant positive impact on IN (Unstandardized β=0.358, Standardized β=0.320, P<0.001). In addition to it, in the case of lower age group, PM has significant positive impact on IN (Unstandardized β=0.337, Standardized β=0.254, P<0.001). Similarly, in the case of middle age group, PM has significant positive impact on IN (Unstandardized β=0.225, Standardized β=0.190, P<0.01). Likewise, in the case of higher age group, PM has significant positive impact on IN (Unstandardized β=0.230, Standardized β=0.227, P<0.001). Moreover, in the case of low level education group, PM has significant positive impact on IN

(Unstandardized □=0.319, Standardized □=0.267, P<0.001). Correspondingly, in the case of

high level education group, PM has significant positive impact on IN (Unstandardized =0.246, Standardized =0.212, P>0.001) as mentioned in Table 9.18.

Group	Unstandardized	Standardized	S.E.	P
Male	.230	.187	.057	***
Female	.358	.320	.061	***
Lower Age	.337	.254	.076	***
Middle Age	.225	.190	.076	**
High Age	.230	.227	.064	***
Low level Education	.319	.267	.053	***
High level Education	.246	.212	.069	***

Table 9.18: The impact of demographic variables on PM → IN

Note: ns=not significant, *=p<0.05, ***=p<0.001.

8.7.8 The Impact of Demographic Variables on proposed relation of Empathy (EM) and Satisfaction (ST)

Data analysis results exposed that, in the case of male group, EP has significant positive impact on ST (Unstandardized =0.112, Standardized =0.115, P<0.05). Conversely, in the case of female group, EP has insignificant negative impact on ST (Unstandardized =-0.001, Standardized =-0.001, P>0.05). In addition to it, in the case of lower age group, EP has insignificant positive impact on ST (Unstandardized =0.023, Standardized =0.023, P>0.05). Contrarily, in the case of middle age group, EP has significant positive impact on ST (Unstandardized =0.171, Standardized =0.189, P<0.01). Contrariwise, in the case of higher age group, EP has insignificant positive impact on ST (Unstandardized =0.041, Standardized =0.042, P>0.05). Moreover, in the case of low level education group, EP has insignificant positive impact on ST (Unstandardized =0.061, Standardized =0.065, P>0.05). Correspondingly, in the case of high level education group, EP has also insignificant positive impact on ST (Unstandardized =0.084, Standardized =0.085, P>0.05) as mentioned in Table 9.19.

Group	Unstandardized β	Standardized β	S.E.	P
Male	.112	.115	.046	*
Female	-.001	-.001	.058	ns
Lower Age	.023	.023	.057	ns
Middle Age	.171	.189	.062	**
High Age	.041	.042	.069	ns
Low level Education	.061	.065	.045	ns
High level Education	.084	.085	.061	ns

Table 9.19: The impact of demographic variables on EP → ST

Note: ns=not significant, *=p<0.05, ***=p<0.001.

8.7.9 The Impact of Demographic Variables on proposed relation of Satisfaction (ST) and Actual Use (AL)

Data analysis results exposed that, in the case of male group, ST has significant positive impact on AL (Unstandardized β=0.291, Standardized β=0.266, P<0.001). Similarly, in the case of female group, ST has significant positive impact on AL (Unstandardized β=0.172, Standardized β=0.158, P<0.05). In addition to it, in the case of lower age group, ST has significant positive impact on AL (Unstandardized β=0.278, Standardized β=0.249, P<0.001). Similarly, in the case of middle age group, ST has significant positive impact on AL (Unstandardized β=0.271, Standardized β=0.277, P<0.001). Likewise, in the case of higher age group, ST has significant positive impact on AL (Unstandardized β=0.175, Standardized β=0.152, P<0.05). Moreover, in the case of low level education group, ST has significant positive impact on AL (Unstandardized β=0.263, Standardized β=0.238, P<0.001). Correspondingly, in the case of high level education group, ST has significant positive impact on AL (Unstandardized β=0.227, Standardized β=0.212, P<0.001) as shown in Table 9.20.

Group	Unstandardized β	Standardized β	S.E.	P
Male	.291	.266	.051	***
Female	.172	.158	.067	*

Lower Age	.278	.249	.063	***
Middle Age	.271	.277	.068	***
High Age	.175	.152	.082	*
Low level Education	.263	.238	.051	***
High level Education	.227	.212	.067	***

Table 9.20: The impact of demographic variables on ST→AL

Note: ns=not significant, *=p<0.05, ***=p<0.001.

8.7.10 The Impact of Demographic Variables on proposed relation of Intention (IN) and Actual Use (AL)

Data analysis results exposed that, in the case of male group, IN has significant positive impact on AL (Unstandardized □=0.244, Standardized □=0.205, P<0.001). Similarly, in the case of female group, IN has significant positive impact on AL (Unstandardized □=0.311, Standardized □=0.256, P<0.001). In addition to it, in the case of lower age group, IN has significant positive impact on AL (Unstandardized □=0.220, Standardized □=0.195, P<0.001). Similarly, in the case of middle age group, IN has significant positive impact on AL (Unstandardized □=0.257, Standardized □=0.220, P<0.01). Likewise, in the case of higher age group, IN has significant positive impact on AL (Unstandardized □=0.370, Standardized □=0.275, P<0.001). Moreover, in the case of low level education group, IN has significant positive impact on AL (Unstandardized □=0.321, Standardized □=0.268, P<0.001). Correspondingly, in the case of high level education group, IN has significant positive impact on AL (Unstandardized □=0.187, Standardized □=0.154, P<0.05) as mentioned in Table 9.21.

Group	Unstandardized □	Standardized □	S.E.	P
Male	.244	.205	.055	***
Female	.311	.256	.075	***
Lower Age	.220	.195	.063	***
Middle Age	.257	.220	.081	**
High Age	.370	.275	.095	***
Low level Education	.321	.268	.055	***
High level Education	.187	.154	.076	*

Table 9.21: The impact of demographic variables on IN→AL

Note: ns=not significant, *=p<0.05, ***=p<0.001.

8.8 Summary

I used SPSS 23 software to produce several tables and charts about the demographic profile of the participants such as gender, age, educational level and which college they were from. Also, this chapter has looked at their mobile usage time and reasons for using mobiles. The results of testing outlier cases and normality showed that there were no outliers amongst the data and that the data distribution can be considered normal. Also, the aim of this chapter was to assess the research model by using structural equation modeling (AMOS 16 software). Thus, I assessed the measurement model and its construct reliability and validity. The measurement model demonstrated a good fit for all the indices suggested by the literature. The findings also presented that all the factors satisfied the criteria of reliability, convergent and discriminant validity.

In the context of the structural model, the fit indices satisfied the recommended threshold values providing a well-fit model to the data. This was followed by hypotheses testing which was the second step to validate the model. There were twelve designed casual relationships, out of which there were ten path relationships that were found to be significant while the other two paths were not significant. The following chapter has discussed the key findings of this chapter.

9 CHAPTER NINE: DISCUSSION

9.1 Introduction

Based on the results obtained from the previous two chapters (qualitative data analysis and advance data analysis chapter), this chapter provides the discussion and comparisons between the results obtained and those reported in the literature review chapter. This chapter discusses the key factors that affect citizens' acceptance of m-government services from the point of view of citizens. The investigation of these factors provides a better understanding of the antecedents of m-government acceptance. This chapter also discusses the key challenges facing the implementation of m-government services in Saudi Arabia from the point of view of the government. Lastly, it incorporates the findings of the focus group and survey to obtain a list of the key factors that influence the citizens' acceptance of m-government services.

9.2 Discussions on the factors that affect citizens' acceptance of using mobile government services

This subsection discusses the factors that affect the acceptance of m-government services from the point of view of citizens in Saudi Arabia. The following subsections provide a discussion of the findings of the survey and the focus groups.

9.2.1 Survey result

The developed model, on the base of in-depth literature review, was empirically tested in order to identify the constructs that affect citizens' acceptance of m-government services. The twelve path relationships in that model were tested and the result attested that reliability has significant impact on citizen satisfaction. Similarly, the responsiveness also has an impact on citizen satisfaction. Correspondingly, citizens' satisfaction affected the actual use of m-government. In the same way, actual use of mgovernment was affected the intention to use of m-government. Additionally, the intention to use m-government was affected the perceived mobility. Consistently, perceived trustworthiness has showed significant impact on intention to use mgovernment. Moreover, attitude towards using m-government also showed significant influence on intention to use m-government in the mainstream of administration.

Likewise, perceived ease of use of m-government has showed an impact on attitudes towards using m-government. Similarly, perceived ease of use also showed an impact on intention to use m-government. In the case of perceived usefulness, perceived ease of use showed significant impact. All these survey results have supported the postulated hypotheses of this study. Contrarily, empathy has not showed any significant impact on citizen satisfaction. Equally, perceived usefulness has not showed any significant impact on attitude towards using m-government.

9.2.1.1 The impact of perceived usefulness of mobile government services on citizens' attitude towards using mobile government services

The results from the quantitative analysis did not find a relationship between perceived usefulness and the user's attitude towards using mobile government services (β=0.031, S.E.=0.050, C.R.=0.614, P>0.05), which do not support the postulated hypothesis (H1) of this study that perceived usefulness has an impact on attitude towards using mgovernment. Findings of this study are consistent with the findings from some previous researches Horst et al. (2007) and Ja'afer & Mohammed (2014) who revealed the same results with the user's attitude towards using e-government services. Correspondingly, similar finds were revealed by Kanokwan and Anu (2014) and Sothaya (2015) on other research contexts. For an instance, Kanokwan and Anu (2014) study found that there is no relationship between perceived usefulness and the user's attitude towards e-marketing services. Similarly, the study by Sothaya (2015) also claimed that there was no relationship between perceived usefulness and the user's attitude towards using mobile Internet television services. Data analysis results exposed that, in the case of male group, perceived usefulness has insignificant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.065, Standardized β=0.059, P>0.05). But, in the case of female group, perceived usefulness has insignificant negative impact on citizens' attitude to use m-government services (Unstandardized β=-0.062, Standardized β=-0.049, P>0.05). In addition to it, in the case of lower age group, perceived usefulness has insignificant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.063, Standardized β=0.054, P>0.05). But, in the case of middle aged group, perceived usefulness has

insignificant negative impact on citizens' attitude to use m-government services (Unstandardized β=-0.005, Standardized β=-0.004, P>0.05). Correspondingly, in the case of higher age group, perceived usefulness has also insignificant negative impact on citizens' attitude to use m-government services (Unstandardized β=-0.050, Standardized β=-0.046, P>0.05). Moreover, in the case of low level education group, perceived usefulness has insignificant positive impact on citizens' attitude to use mgovernment services (Unstandardized β=0.033, Standardized β=0.029, P>0.05). Similarly, in the case of high level education group, perceived usefulness has also insignificant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.031, Standardized β=0.027, P>0.05). Furthermore, in the case of students group, perceived usefulness has insignificant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.015, Standardized β=0.014, P>0.05). Similarly, in the case of professional group, perceived usefulness has also insignificant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.139, Standardized β=0.078, P>0.05). To be concluded, results revealed that there is no impact of demographic variables on proposed relation of perceived usefulness and citizens' attitude to use m-government services., This study also concludes, on the basis of data analysis and findings, that with the increase in the perception of citizens about the usefulness of m-government services no corresponding effect gets to be imparted on citizens' attitude toward using m-government services. There is no effect of demographic variables on the relation of perceived usefulness and citizens' attitude towards using m-government services.

9.2.1.2 The impact of perceived usefulness of mobile government services on intention to use mobile government services

On the other hand, the results from the quantitative analysis shows a significant relationship between perceived usefulness and intention to use mobile government services (β=0.260, S.E.=0.030, C.R.=8.524, P<0.05). This supports the study postulated hypothesis (H4) of this study, that perceived usefulness has any impact on intention to use m-government. These findings are consistent with findings from the literature review. For instance, Wang (2014) and Mallat et al. (2009), found the positive

relationship between the perceived usefulness and the intention to use mobile services. Similarly, findings of Alsaif (2014), exposed that with the increase in the user perception to use electronic services, there will be increase in the user intention to use the mobile government services as well. ElKheshin (2016), proved that perceived usefulness is a strong prognosticator of intention to use electronic service. Moreover, studies of Ohme (2014) and Shanab & Haider (2015), proved that perceived usefulness is a strong predictor of intentions to use any object or services. The study by Faziharudean and Li-Ly (2011), also found a similar significant relationship. Data analysis results exposed that, in the case of the male group, perceived usefulness has significant positive impact on citizens' intention to use m-government services (Unstandardized β=0.261, Standardized β=0.308, P<0.05). Similarly, in the case of the female group, perceived usefulness has significant positive impact on citizens' intention to use mgovernment services (Unstandardized β=.265, Standardized β=-0.273, P<0.05). In addition to it, in the case of the lower age group, perceived usefulness has significant positive impact on citizens' intention to use m-government services (Unstandardized β=0.220, Standardized β=0.233, P<0.05). Likewise, in the case of the middle age group, perceived usefulness has significant positive impact on citizens' intention to use m-government services (Unstandardized β=.294, Standardized β=-0.370, P<0.05). Correspondingly, in the case of the higher age group, perceived usefulness has also significant positive impact on citizens' intention to use m-government services (Unstandardized β=0.301, Standardized β=0.323, P<0.05). Moreover, in the case of the low level education group, perceived usefulness has significant positive impact on citizens' intention to use m-government services (Unstandardized β=0.221, Standardized β=0.250, P<0.05). Similarly, in the case of high level education group, perceived usefulness has also significant positive impact on citizens' intention to use m-government services (Unstandardized β=0.285, Standardized β=0.328, P<0.05). Furthermore, in the case of the students group, perceived usefulness has significant positive impact on citizens' intention to use m-government services (Unstandardized β=0.218, Standardized β=0.254, P<0.05). Equally, in the case of the professionals group, perceived usefulness has also significant positive but strong impact on citizens' intention to use m-government services (Unstandardized β=0.669, Standardized

□=0.624, P<0.05). To conclude, results revealed that there is no impact of demographic variables on proposed relation of perceived usefulness and citizens' intention to use m-government services except in the case of the professionals group, where data analysis showed professionals' intention to use m-government get stronger when they feel that any particular service becomes more useful as compared to the students. To conclude, this study, on the base of data analysis findings, claims that with the increase in the percep-

tion of citizens about the usefulness of m-government services there will be an increasing effect on citizens' intention to use m-government services. There is no any effect of any demographic variable on the relation of perceived usefulness and citizens' intention to use m-government services.

9.2.1.3 The impact of perceived ease of use of mobile government services on attitude towards using mobile government services

Based on the results from the quantitative analysis, the perceived ease of use has an impact on the user's attitude towards using mobile government services (β=0.107, S.E.=0.048, C.R.=2.217, P<0.05), which supports the proposed hypothesis (H2) of this study that perceived ease of use impacts on attitude towards using m-government. The findings are consistent with findings from the literature review. As ElKheshin (2016) reported, perceived ease of use has positive impact on attitude towards using egovernment. In the same way, Ohme (2014) expressed that perceived ease of use has positive impact on attitude towards using m-government. Similar findings are reported by the studies of Mahadeo (2009), Ahmed et al. (2014), and Sothaya et al. (2009). Data analysis results exposed that, in the case of the male group, perceived ease of use has insignificant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.051, Standardized β=0.048, P>0.05). But shockingly, in the case of the female group, perceived ease of use has significant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.226, Standardized β=0.188, P<0.05). In addition to it, in the case of the lower age group, the perceived ease of use has insignificant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.080, Standardized β=0.075, P>0.05). But, in the case of the middle aged group, perceived ease of use has insignificant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.121, Standardized β=-0.091, P>0.05). Surprisingly, in the case of higher aged group, perceived ease of use has significant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.172, Standardized β=0.178, P<0.05). Moreover, in the case of low level the education group, perceived ease of use has insignificant positive impact on

citizens' attitude to use m-government services (Unstandardized β=0.078, Standardized β=0.073, P>0.05). Similarly, in the case of the high level education group, perceived ease of use has also insignificant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.164, Standardized β=0.145, P>0.05). Furthermore, in the case of the students group, perceived ease of use has significant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.118, Standardized β=0.111, P<0.05). On the contrary, in the case of the professionals group, perceived ease of use has also insignificant positive impact on citizens' attitude to use m-government services (Unstandardized β=0.026, Standardized β=0.018, P>0.05). To be concluded, results revealed that citizens' attitude to use mgovernment services regarding that of the female group as compared to the male group, citizens' attitude to use m-government services regarding the higher age group as compared to other age groups and citizens' attitude to use m-government services regarding the comparison between those of the students group to the professionals group, develops more with the increase in the perception of ease of use. Rest of the demographic variables have shown no impact on proposed relation between perceived ease of use and citizens' attitude to use m-government services. Thus, this study, on the basis of the data analysis findings, claims that with the increase in the perception of citizens about the easiness of m-government services there will be an increasing effect on citizens' attitude towards using m-government services.

9.2.1.4 The impact of perceived ease of use of mobile government services on perceived usefulness of mobile government services

Moreover, quantitative data analysis results have revealed that perceived ease of use has a significant, positive, and strong impact on perceived usefulness of utilisation of mobile government services (β=0.421, S.E.=0.036, C.R.=11.696, P<0.05), which supports the postulated hypothesis (H3) of this study that propounds that perceived ease of use have an impact on perceived usefulness of m-government. Yet again, findings are in line with the previous literature as ElKheshin (2016)'s study proved that perceived ease of use has significant, positive and strong impact on perceived usefulness of e-government. Correspondingly, Bilal, Hashmi, & Fiaz (2015)'s study also revealed that perceived ease of use has significant and positive effect on perceived usefulness of e-Tax. Besides, results of other researches performed by Davis (1989), Devaraj et al.

(2002) Lucas and Spitlar (1999), Gefen et al. (2003) and Chang et al. (2005) also give support to the findings of this study. Data analysis results exposed that, in the case of male group, perceived ease of use has significant positive impact on perceived usefulness (Unstandardized β=0.406, Standardized β=0.425, P<0.001). Similarly, in the case of the female group, perceived ease of use has also significant positive impact on perceived usefulness (Unstandardized β=0.448, Standardized β=0.470, P<0.001). The effect of perceived ease of use on perceived usefulness is slightly greater in the case of females as compared to males. In addition to it, in the case of the lower aged group, perceived ease of use has significant positive impact on perceived usefulness (Unstandardized β=0.333, Standardized β=0.360, P<0.001). Similarly, in the case of the middle aged group, perceived ease of use has also significant positive impact on perceived usefulness (Unstandardized β=0.611, Standardized β=0.588, P<0.001). Correspondingly, in the case of the higher age group, perceived ease of use has significant positive impact on perceived usefulness (Unstandardized β=0.396, Standardized β=0.450, P<0.001). The effect of perceived ease of use on perceived usefulness is very strong in the case of the middle aged group as compared to the lower and higher aged group. Moreover, in the case of the low level education group, perceived ease of use has significant positive impact on perceived usefulness (Unstandardized β=0.386, Standardized β=0.408, P<0.001). Similarly, in the case of high level education group, perceived ease of use has also significant positive impact on perceived usefulness (Unstandardized β=0.491, Standardized β=0.500, P<0.001). The effect of perceived ease of use on perceived usefulness is moderately greater in the case of the high level education group as compared to the low level education group. Furthermore, in the case of the students group, the perceived ease of use has significant positive impact on perceived usefulness (Unstandardized β=0.415, Standardized β=0.427, P<0.001). Similarly, in the case of the professionals group, the perceived ease of use has also significant positive impact on perceived usefulness (Unstandardized β=0.448, Standardized β=0.564, P<0.001). The effect of perceived ease of use on perceived usefulness is to some extent greater in the case of the professionals group as compared to the students group. To be concluded, this study, on the basis of data analysis and findings, claims that with the increase in the perception of citizens about the easiness of m-government services, there will be an increasing effect on citizens' perception of usefulness of m-government services.

9.2.1.5 The impact of attitude towards using mobile government services on intention to use of mobile government services

Again, quantitative data analysis of this study showed that there is significant relationship between the attitude towards m-government services and intention to use mgovernment services (□=0.081, S.E.=0.026, C.R.=3.125, P<0.05), which supports the postulated hypothesis (H5) of this study that attitude towards using m-government services has an impact on intention to use m-government. Similar findings are reported by different studies in the available literature as ElKheshin (2016) has revealed that attitude towards using e-government has a very strong, positive and significant impact on intention to use e-government. Similarly, the results of studies of Crespo and Bosque (2008), Ha and Stoel (2009), Taylor and Todd (1995a), and Wu and Chen (2005) have reported parallel findings that attitude has impact on intention which were conducted in closely related contexts like e-shopping, information technology and online tax etc. Data analysis results exposed that, citizens' intention to use mgovernment services in the case of the male group, citizens' attitude to use mgovernment services has insignificant positive impact on citizens' intention to use mgovernment services (Unstandardized □=0.046, Standardized □=0.060, P>0.05). But shockingly, citizens' intention to use m-government services in the case of the female group, citizens' attitude to use m-government services has significant positive impact on citizens' intention to use m-government services (Unstandardized □=0.148, Standardized □=0.192, P<0.001). In addition to it, citizens' attitude to use m-government services, in the case of the lower age group, has insignificant positive impact on citizens' intention to use m-government services (Unstandardized □=0.043, Standardized

□=0.052, P>0.05). Similarly, in the case of middle age group, citizens' attitude to use m-government services has insignificant positive impact on citizens' intention to use m-government services (Unstandardized □=0.053, Standardized □=0.086, P>0.05). Likewise, in the case of higher aged group, citizens' attitude to use m-government services has significant positive impact on citizens' intention to use m-government services (Unstandardized □=0.171, Standardized □=0.201, P<0.001). Moreover, in the case of the low level education group, citizens' attitude to use m-government services has significant positive impact on citizens' intention to use m-government services (Unstandardized □=0.074, Standardized □=0.097, P<0.05). Contrarily, citizens' intention to use m-government services in the case of high level education group, citizens' attitude to use m-government services has insignificant positive impact on

citizens' intention to use m-government services (Unstandardized =0.080, Standardized =0.104, P>0.05). Furthermore, in the case of the students group, citizens' attitude to use m-government services has significant positive impact on citizens' intention to use m-government services (Unstandardized =0.098, Standardized =0.125, P<0.001). Contrarily, in the case of professionals group, citizens' attitude to use m-government services has insignificant negative impact on citizens' intention to use m-government services (Unstandardized =-0.051, Standardized =-0.082, P>0.05). In the conclusion, results revealed that citizens' intention to use m-government services of female group as compare to male group, citizens' intention to use m-government services of higher aged group as compared to other age groups, citizens' intention to use mgovernment services of low level education group as compared to high level education group and citizens' intention to use m-government services of students as compared to the professionals group develop more with the increase in citizens' intention to use mgovernment services. In this study, on the base of data analysis findings, it could be claimed that with the increase in the citizens' attitude towards using m-government services there will be an increasing effect on citizens' intention to use m-government services. Demographic variables have significant impact on the relation of citizens' attitude toward using m-government services and citizens' intention to use mgovernment services.

9.2.1.6 The impact perceived trustworthiness of mobile government services and intention to use of mobile government services

Quantitative data analysis further exhibited that perceived trustworthiness has significant positive effect on intention to use m-government services (=0.200, S.E.=0.028, C.R.=7.146, P<0.05), which supports the proposed hypothesis (H6) that perceived trustworthiness has impact on intention to use m-government services. This outcome substantiates the claims made earlier, that trust was a significant factor for egovernment acceptance. Alharbi (2016) proved that trust is the most critical factor which influence the intention of electronic services' users. Similar finding were given by Alrowili, Alotaibi, & Alharbi (2015). In addition to it, Alsaif (2014) reported that trust is also an important factor which influence the intention of the user. Moreover, ElKheshin (2016) reported too that trust is a vital factor in intention to use online services. In the same way, Mensah (2017) revealed that trust has significant positive effect on intention to use electronic government services. On the same grounds,

Rehman, Esichaikul, & Kamal (2012) exposed that trust has principal impression on intention to use e-government services. As this study has worked on the intention to use m-government services, Saif, Jasimuddin, & Mansoor (2017) proved that trust has significant impression on intention to use m-government services. . Similar types of findings are reported by Belanger and Carter (2008), Carter and Belanger (2005), and Schaupps et al. (2010) in different electronic services related contexts. Data analysis results exposed that, the case of male group, perceived trustworthiness has significant positive impact on citizens' intention to use m-government services (Unstandardized β=0.172, Standardized β=0.211, P<0.001). Similarly, in the case of the female group, perceived trustworthiness has significant positive impact on citizens' intention to use m-government services (Unstandardized β=0.247, Standardized β=0.316, P<0.001). In addition to it, in the case of lower aged group, perceived trustworthiness has significant positive impact on citizens' intention to use (Unstandardized β=0.132, Standardized β=0.158, P<0.01). Similarly, in the case of middle age group, perceived trustworthiness has significant positive impact on citizens' intention to use mgovernment services (Unstandardized β=0.223, Standardized β=0.336, P<0.001). Likewise, in the case of higher aged group, perceived trustworthiness has significant positive impact on citizens' intention to use m-government services (Unstandardized β=0.286, Standardized β=0.317, P<0.001). Moreover, in the case of low level education group, perceived trustworthiness has significant positive impact on citizens' intention to use m-government services (Unstandardized β=0.180, Standardized β=0.236, P<0.001). Correspondingly, in the case of high level education group, perceived trustworthiness has significant positive impact on citizens' intention to use mgovernment services (Unstandardized β=0.239, Standardized β=0.271, P>0.001). Furthermore, citizens' intention to use m-government services in the case of students group, perceived trustworthiness has significant positive impact on citizens' intention to use m-government services (Unstandardized β=0.217, Standardized β=0.267, P<0.001). Similarly, in the case of the professionals group, perceived trustworthiness has significant positive impact on citizens' intention to use services (Unstandardized β=0.119, Standardized β=0.175, P<0.05). The results revealed that there is no impact of demographic variables on proposed relation of perceived trustworthiness and citizens' intention to use services. This study, on the basis of data analysis and findings, claims that with the increase in the perception of citizens' trustworthiness in using

mgovernment services there will be an increasing effect on citizens' intention to use mgovernment services. Demographic variables have no impact on the relation of perception of citizens' trustworthiness in using m-government services and citizens' intention to use m-government services.

9.2.1.7 The impact of perceived mobility of mobile government of services on intention to use of mobile government services

Quantitative data analysis exhibited that perceived mobility has significant positive effect on intention to use m-government services (□=0.285, S.E.=0.042, C.R.=6.719, P<0.05), which supports the hypothesis (H7) that perceived mobility has impact on intention to use m-government services. The findings are consistent with those of the literature review. Wang (2014) empirically proved that perceived mobility has strong positive effect on intention to use electronic services. Similar types of results were revealed by Hong et al. (2008), Mallat et al. (2009) and Faziharudean and Li-Ly (2011). Data analysis results exposed that, in the case of the male group, perceived mobility has significant positive impact on citizens' intention to use m-government services (Unstandardized □=0.230, Standardized □=0.187, P<0.001). Similarly, in the case of the female group, perceived mobility has significant positive impact on citizens' intention to use m-government services (Unstandardized □=0.358, Standardized □=0.320, P<0.001). In addition to it, citizens' perceived mobility to use m-government services, in cases of the lower aged group, has significant positive impact on citizens' intention to use m-government services (Unstandardized □=0.337, Standardized □=0.254, P<0.001). Similarly, in the case of middle age group, perceived mobility has significant positive impact on citizens' intention to use m-government services (Unstandardized □=0.225, Standardized □=0.190, P<0.01). Likewise, in the case of the higher aged group, perceived mobility has significant positive impact on citizens' intention to use m-government services (Unstandardized □=0.230, Standardized □=0.227, P<0.001). Moreover, in the case of low level education group, perceived mobility has significant positive impact on citizens' intention to use m-government services (Unstandardized □=0.319, Standardized □=0.267, P<0.001). Correspondingly, in the case of high level education group, perceived mobility has significant positive impact on citizens' intention to use m-government services (Unstandardized □=0.246, Standardized □=0.212, P>0.001). Furthermore, in the case of students group, perceived mobility has

significant positive impact on citizens' intention to use m-government services (Unstandardized □=0.314, Standardized □=0.261, P<0.001). Contrarily, in the case of professionals group, perceived mobility has insignificant positive impact on citizens' intention to use m-government services (Unstandardized □=0.048, Standardized □=0.052, P>0.05). The results revealed that citizens' intention to use mgovernment services regarding the comparison of students to professionals develop more significantly with the perceived mobility. There is no impact of other demographic variables on the proposed relation of perceived mobility and citizens' intention to use m-government services. This study, on the base of data analysis and findings, claims that with the increase in the perception of citizens about m-government services mobility there will be an increasing effect on citizens' intention to use m-government services.

9.2.1.8 The impact of perceived service quality of mobile government services on citizens' satisfaction of mobile government services

As discussed above, perceived service quality was measured through three factors called reliability, responsiveness, and empathy. Based on the results from the quantitative analysis, reliability has significant positive effect on citizens' satisfaction about using m-government services (□=0.118, S.E.=0.031, C.R.=3.841, P<0.05), which supports the hypothesis (H8a) that reliability has impact on citizens' satisfaction about use m-government services. Correspondingly, data analysis results further revealed that responsiveness has significant positive effect on citizens' satisfaction about using mgovernment services (□=0.118, S.E.=0.038, C.R.=3.112, P<0.05), which supports the hypothesis (H8b) that responsiveness has impact on citizens' satisfaction about use mgovernment services. These findings are consistent with the findings from the literature review, e.g. with Alhujran et al. (2013), Tao (2008), Sharma (2015), and Sultana, Ahlan, & Habibullah (2016) who argued that there was a relationship between the reliability and citizens' satisfaction in context. Also, there was a relationship between the responsiveness and citizens' satisfaction in the same context. In support to it, Sharma (2015) argued that responsiveness is a key determining factor of citizens satisfaction about electronic services. On the contrary, data analysis results showed that empathy has insignificant positive effects on citizens' satisfaction about using m-government services (□=0.069, S.E.=0.036, C.R.=1.902, P>0.05), which does support the hypothesis (H8c) that empathy has any impact on citizens' satisfaction about the use mgovernment

services. Similar type of findings, in literature, are reported by Craig & Doug (2011) that there is no impact of empathy on satisfaction regarding use of electronic services. Data analysis results exposed that, in the case of the male group, reliability has insignificant positive impact on citizens' satisfaction to use mgovernment services (Unstandardized β=0.069, Standardized β=0.090, P>0.05). But again shockingly, in the case of the female group, reliability has significant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.220, Standardized β=0.260, P<0.001). In addition to it, in the case of the lower aged group, reliability has insignificant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.018, Standardized β=0.024, P>0.05). But, in the case of the middle aged group, reliability has significant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.134, Standardized β=0.182, P<0.01). Likewise, in the case of higher aged group, reliability has significant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.332, Standardized β=0.327, P<0.001). Moreover, in the case of the low level education group, reliability has significant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.115, Standardized β=0.149, P<0.01). Similarly, in the case of the high level education group, reliability has also significant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.126, Standardized β=0.152, P<0.05). Furthermore, in the case of the students group, reliability has significant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.129, Standardized β=0.111, P<0.05). On the contrary, in the case of professionals group, reliability has insignificant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.048, Standardized β=0.074, P>0.05). The results revealed that citizens' satisfaction to use m-government services of the female group as compared to male group , of students as compared to the professionals group develop more with the increase in the perception of reliability. Additionally, results also exhibited that with the increase in the age, citizens' satisfaction to use m-government services increases too with the increase in reliability. The rest of the demographic variables have shown

no impact on proposed relation of reliability and citizens' satisfaction to use mgovernment services. Data analysis results exposed that, in the case of the male group, responsiveness has significant positive impact on citizens' satisfaction to use mgovernment services (Unstandardized β=0.138, Standardized β=0.143, P<0.01). But shockingly, in the case of the female group, responsiveness has insignificant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.082, Standardized β=0.088, P>0.05). In addition to it, in the case of the lower aged group, responsiveness has significant positive impact on citizens' satisfaction to use services (Unstandardized β=0.141, Standardized β=0.154, P>0.05). But, in the case of the middle aged group, responsiveness has insignificant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.144, Standardized β=-0.139, P>0.05). Likewise, in the case of the higher aged group, responsiveness has insignificant positive impact on citizens' satisfaction to use mgovernment services (Unstandardized β=0.047, Standardized β=0.050, P>0.05). Moreover, in the case of the low level education group, responsiveness has significant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.124, Standardized β=0.131, P<0.05). In the case of high level education group, responsiveness has also insignificant positive impact on citizens' satisfaction to use mgovernment services (Unstandardized β=0.106, Standardized β=0.111, P>0.05). Furthermore, in the case of the students group, responsiveness has significant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.142, Standardized β=0.152, P<0.001). On the contrary, in the case of the professionals group, responsiveness has insignificant negative impact on citizens' satisfaction to use m-government services (Unstandardized β=-0.155, Standardized

β=-0.142, P>0.05). Results revealed that citizens' satisfaction to use m-government services of male group as compared to female groups, of the lower aged group as compared to the other age groups, of the low level education group as compared to high level education group and of the students as compare to the professionals develop more expressively with the increase in the perception of responsiveness. Data analysis results exposed that, in the case of the male group, empathy has significant positive impact on

citizens' satisfaction to use m-government services (Unstandardized β=0.112, Standardized β=0.115, P<0.05). In the case of the female group, empathy has insignificant negative impact on citizens' satisfaction to use m-government services (Unstandardized β=-0.001, Standardized β=-0.001, P>0.05). In addition to it, in the case of the lower aged group, empathy has insignificant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.023, Standardized β=0.023, P>0.05). On the contrary, in the case of the middle aged group, empathy has significant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.171, Standardized β=0.189, P<0.01). On the contrary, in the case of the higher aged group, empathy has insignificant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.041, Standardized β=0.042, P>0.05). Moreover, in the case of the low level education group, empathy has insignificant positive impact on citizens' satisfaction to use mgovernment services (Unstandardized β=0.061, Standardized β=0.065, P>0.05). Correspondingly, in the case of the high level education group, empathy has also insignificant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.084, Standardized β=0.085, P>0.05). Furthermore, in the case of the students group, empathy has insignificant positive impact on citizens' satisfaction to use m-government services (Unstandardized β=0.055, Standardized β=0.058, P>0.05). Likewise, in the case of the professionals group, empathy has insignificant positive impact on citizens' satisfaction to use m-government services (Unstandardized

β=0.129, Standardized β=0.136, P>0.05). Results revealed that citizens' satisfaction to use m-government services of the male group as compared to the female group and of the middle aged group as compared to the other aged groups develop more significantly with the increase in the perception of empathy. There is no impact of other demographic variables on proposed relation of empathy and citizens' satisfaction to use m-government services. This study, on the basis of data analysis and findings, claims that with the increase in the perception of citizens' reliability and responsiveness in using m-government services there will be an increasing effect on citizens' satisfaction to use m-government services. It also reveals the fact that with the increase in the perception of citizens' empathy to use m-government services there will be increasing effect on citizens satisfaction to use m-government services but this relation is not significant.

9.2.1.9 The impact of citizens' satisfaction of mobile government services and actual use of mobile government services

The data analysis results support the relationship between people's satisfaction and actual use of m-government services (β=0.250, S.E.=0.041, C.R.=6.137, P<0.05), which , supports the hypothesis (H9) that citizens' satisfaction has an impact on citizens' actual use of services. This outcome contradicts some researches, such as those of Cox and Dale (2001), Wang (2003), Barnes and Vidgen (2004), Kaisara and Pather (2009), and Alanezi et al. (2010), but is in line with the others like Doll and Torkzadeh (1988) and Seddon and Kiew (1994). Moreover, taking the issue in differing environmental surroundings, a number of other scholars like Almahamid et al. (2010), AlGhaith et al. (2010), Susanto and Goodwin (2010), Altameem et al. (2006), and Wangpipatwong et al. (2005) have achieved the same results, demonstrating that if citizens are satisfied with m-government services, they are prepared to become frequent users. Similarly, Alsaif (2014) argued that satisfaction is antecedent of actual use. Data analysis results exposed that, in the case of the male group, citizens' satisfaction to use m-government services has significant positive impact on citizens' actual use mgovernment services (Unstandardized β=0.291, Standardized β=0.266, P<0.001). Similarly, in the case of the female group, citizens' satisfaction to use m-government services has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.172, Standardized β=0.158, P<0.05). In addition to it, in the case of the lower aged group, citizens' satisfaction to use m-government services has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.278, Standardized β=0.249, P<0.001). Similarly, in the case of the middle aged group, citizens' satisfaction to use m-government services has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.271, Standardized β=0.277, P<0.001). Likewise, in the case of the higher aged group, citizens' satisfaction to use m-government services has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.175, Standardized β=0.152, P<0.05). Moreover, in the case of the low level education group, citizens' satisfaction to use m-government services has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.263, Standardized β=0.238, P<0.001). Correspondingly, in the case of the high level education group, citizens' satisfaction to

use m-government services has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.227, Standardized β=0.212, P<0.001). Furthermore, in the case of the students group, citizens' satisfaction to use m-government services has significant positive impact on citizens' actual use mgovernment services (Unstandardized β=0.290, Standardized β=0.257, P<0.001). On the contrary in the case of the professionals group, citizens' satisfaction to use mgovernment services has insignificant negative impact on citizens' actual use mgovernment services (Unstandardized β=-0.052, Standardized β=-0.064, P>0.001).

The results revealed that citizens' actual use m-government services of students as compared to professionals develop more significantly with the increase in the perception of citizens' satisfaction to use services. There is no impact of other demographic variables on proposed relation of citizens' satisfaction to use m-government services and citizens' actual use m-government services. The study finds on the basis of the data collections and analysis that with the increase in the citizens' satisfaction of using m-government services there will be an increasing effect on citizens' actual use of mgovernment services.

9.2.1.10 The impact of intention to use mobile government services on actual use of mobile government services

Based on the results from the quantitative analysis, results revealed that the intention to use m-government services has significant positive impact on the actual use of mgovernment services (β=0.268, S.E.=0.045, C.R.=5.996, P<0.05), which is giving support to, the hypothesis (H10), which this study has proposed, that citizens' intention to use m-government has an impact on citizens' actual use of m-government services. These findings are consistent with findings from the literature review, for instance with Alsaif (2014), Babullah, Dwivedi, & Williams (2015) and ElKheshin, (2016). Similar types of findings were revealed by Sahari et al. (2012). Data analysis results exposed that, citizens' intention to use m-government services regarding the case of the male group, citizens' intention to use m-government services has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.244, Standardized β=0.205, P<0.001). Similarly, citizens' intention to use m-government services, in the case of the female group, has significant positive impact on citizens' actual use mgovernment services (Unstandardized β=0.311, Standardized β=0.256, P<0.001). In

addition to it, citizens' intention to use m-government services, in the case of lower age group, has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.220, Standardized β=0.195, P<0.001). Similarly, the citizens' intention to use m-government services, in the case of the middle aged group, has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.257, Standardized β=0.220, P<0.01). Likewise, citizens' intention to use m-government services, in the case of higher age group, has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.370, Standardized β=0.275, P<0.001). Moreover, the citizens' intention to use mgovernment services, in the case of low the level education group, has a significant positive impact on citizens' actual use m-government services (Unstandardized β=0.321, Standardized β=0.268, P<0.001). Correspondingly, in the case of the high level education group, citizens' intention to use m-government services has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.187, Standardized β=0.154, P<0.05). Furthermore, in the case of students group, citizens' intention to use m-government services has significant positive impact on citizens' actual use m-government services (Unstandardized β=0.262, Standardized β=0.217, P<0.001). On the contrary, citizens' intention to use m-government services in the case of professionals group, citizens' intention to use m-government services has insignificant negative impact on citizens' actual use m-government services (Unstandardized β=0.177, Standardized β=0.162, P>0.05). These results revealed that the citizens' actual use m-government services regarding students as compared to the professionals develop more significantly with the increase citizens' intention to use mgovernment services.. There is no impact of other demographic variable on proposed relation of citizens' intention to use m-government services and citizens' actual use mgovernment services. This study concludes, on the basis of data analysis findings, that with the increase in the citizens' intention to use m-government services there will be an increasing effect on citizens' actual use of m-government services.

9.2.2 Focus groups and open-ended questions results

The participants in the focus groups and the answers to the open-ended questions accounted for several factors influencing the citizen's acceptance of m-governments

services within Saudi Arabia. These factors are trust in mobile, trust in government, ease of use, usefulness, citizens' satisfaction, citizens' awareness, digital divide and service quality. These findings are in line with the results of earlier m-government researches within different context (e.g. Liu et al. 2014; Hung et al. 2013; ALThunibat, 2011; Aloudat et al. 2014; Wang et al., 2012; Sharref et al. 2012; Susanto and Goodwin, 2010; Abdelghaffar and Magdy, 2012; Mamte et al. 2013). The next subsection discusses how they compare with the results of my quantitative analysis.

9.2.3 Common Results from the survey focus groups and opened questions.

The next figure 10.1 shows the results from both the qualitative and the quantitative analysis. This study finds eight factors on the basis of quantitative data analysis which impact on citizen acceptance of m-government services. These factors are: ease of use, usefulness, trust, mobility, citizens' satisfaction, intention to use, attitude towards use, and service quality. Besides, this study finds nine factors on the base of qualitative data analysis which have impacts on citizen acceptance of m-government services. These factors are: ease of use, service quality, usefulness, mobility, citizens' satisfaction, trust, citizen's awareness, digital divide, and intention to use. As the figure demonstrates, the common factors include trust, ease of use, usefulness, citizens' satisfaction and service quality. It can be realized that there are several other factors which are acquired from the focus groups and the open-ended questions such as citizens' awareness and digital divide. These factors might complement the study model to clarify the citizen's acceptance of m-government services.

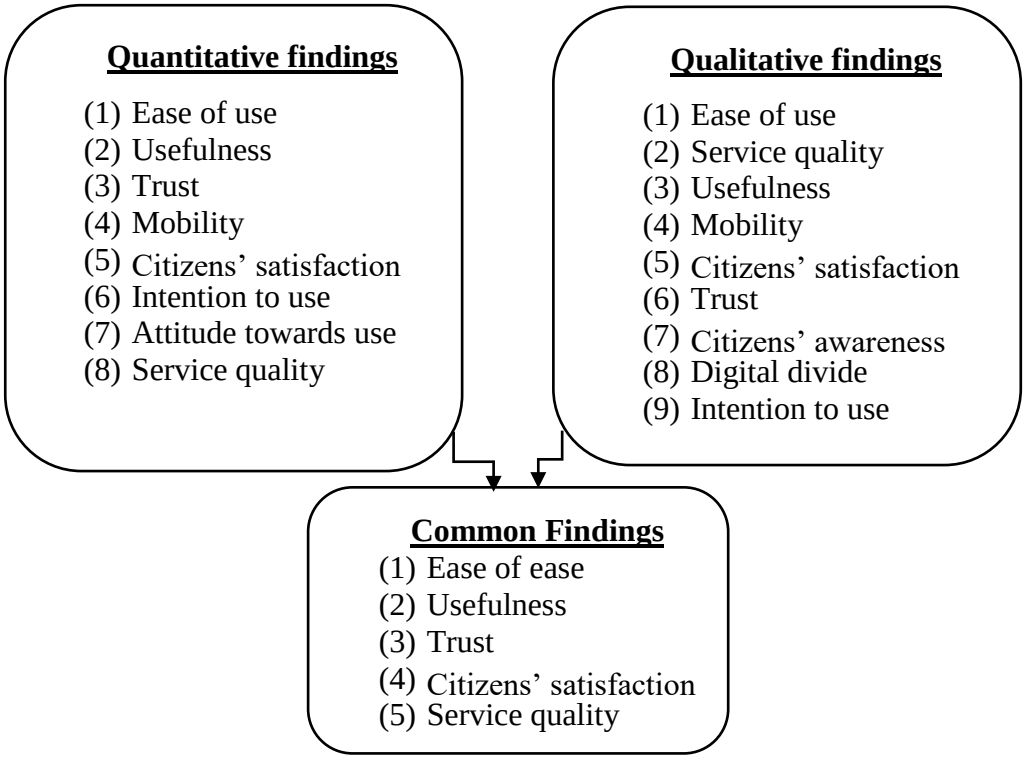

Figure 10.1: The common finding from both the qualitative and the quantitative

9.3 Discussions on the key challenges facing the implementation of m-government services

Even though the supply-side implementation of m-government services was not the focus of this research, the interviewees indicated several difficulties confronting mgovernment implementation in Saudi Arabia. In accordance with m-government officials within Saudi Arabia, the key challenges and hindrances include change management, legal issues, technical issues, lack of support, collaboration issues and the fact that there is no guidance on the practical steps to implement m-government related projects. These findings are in line with the results of earlier e-government researches. For example, Al-Omari (2006) found that the lack of an enabling legal framework is one of the challenges facing e-government at Jordan. Also, Abu-samaha and Abd-samad (2006) found the *lack of advanced and secure technical infrastructure* is one of the challenges facing e-government in at Jordan.

Finally, Alshehri and Drew (2010) found similar results of this research within the same context (Saudi Arabia). They found that several challenges facing e-government at Saudi Arabia included technical issues, resistance to change to electronic ways, lack of partnership and collaboration, lack of policy and regulation for e-usage and lack of strategic planning.

9.4 Summary

The aim of this chapter was to discuss the outcomes of the data analysis in the previous two chapters (qualitative data analysis and advance data analysis chapter). This chapter also presented the key factors that affect citizens' acceptance of m-government services. These factors are trust in mobile, trust in government, ease of use, usefulness, citizens' satisfaction, citizens' awareness, digital divide and service quality. This chapter also discussed the key challenges which hinder and impede the implementation of m-government services at Saudi Arabia from the point of view of government. These challenges include change management, legal issues, technical issues, lack of support, collaboration issues and that there is no practical step to implement m-government projects.

10 CHAPTER TEN: CONCLUSIONS AND RECOMMENDATIONS

10.1 Introduction

This chapter summarizes the main findings of the research by explaining in detail which study objectives are achieved and how this study justifies the answers of research questions. This chapter also recommends suggestions to the Saudi Arabian Government policy makers how to enhance the citizens' acceptance of using mgovernment services. This chapter also acknowledges possible limitations along with the proposed directions for the future research.

10.2 Conclusions

There are several studies which have been carried out by information systems and behavioural science researchers to find out the determinants which can influence the citizens' intention to use e-government services. To give further ease to citizens to use government services, a new concept by the name of m-government services was introduced. It is also called mobile government. M-government means provision of government services to the citizens through SMS or text messaging from mobile phones. Again, there is a very low level of acceptance from citizens of m-government services.

Saudi Arabia is one the countries who are providing m-government services to their citizens. The service which is provided by Saudi Arabia to their citizen is called "Maak". As discussed above, the m-government product Maak has been introduced in order to create an attractive and relevant environment for the growth of this type of service in the Kingdom. Yasser has launched the official application of the mgovernment Maak for Android and iPhone devices. Through Maak, official governmental applications forms can be downloaded. Again, Saudi Arabia is also one of countries where acceptance rate of m-government services is very low. It is the need of time to find out what are the critical factors which can enhance the citizens acceptance of m-government services. To overcome this issue, this study has been started and conducted.

This study was carried out in two phases. In the first phase, a theoretical research framework was developed based on extensive literature review, which was later

validated empirically. After it, in the second phase, qualitative analysis was conducted to give support to the findings of quantitative data analysis. In the quantitative phase, through data collected from citizens of Saudi Arabia, results have revealed that there are eight factors which impact on the acceptance of the citizenry of m-government services. These factors are: ease of use, usefulness, trust, mobility, citizens' satisfaction, intention to use, attitude towards use, and service quality. As per the discussion of results, there is no relationship between perceived usefulness and the user's attitude towards using mobile government services. Besides, the relationship lies between perceived usefulness and intention to use mobile government services. Additionally, the perceived ease of use has an impact on the user's attitude towards using mobile government services. Moreover, that perceived ease of use has a strong impact on perceived usefulness of mobile government services. Similarly, there is a relationship between the attitude towards m-government services and intention to use mgovernment services. In the same way, perceived trustworthiness has an effect on intention to use - government services. Likewise, perceived mobility has effect on intention to use m-government services. As discussed above, perceived service quality was measured through three factors, called reliability, responsiveness, and empathy. Reliability has effect on citizens' satisfaction about using m-government services. Consistently, responsiveness also has an effect on citizens' satisfaction about using mgovernment services. Contrarily, empathy has no impact on citizens' satisfaction to use m-government services. Furthermore, there is a relation between satisfaction of the people and actual use of m-government services. Also, intention to use m-government services has impact on actual use of m-government services.

Correspondingly, in the qualitative phase, whose data was also collected from citizens of Saudi Arabia through qualitative interview and focus groups, results revealed that there are nine factors which impact on citizen acceptance of m-government services. And these factors are: ease of use, service quality, usefulness, mobility, citizens' satisfaction, trust, citizen's awareness, digital divide, and intention to use. There were five factors which were common in findings of quantitative and qualitative analysis. And these factors are: trust, ease of use, usefulness, citizens' satisfaction and service quality. It was further realized during focus groups and qualitative interviews that there are several other factors which might affect citizen's intention to use m-government services such as citizens' awareness and digital divide. These factors

might complement the study model to clarify the citizen acceptance of m-government services.

10.3 Recommendations

The finding of the survey analysis presented above suggest that the perceived service quality; perceived trustworthiness; perceived usefulness; perceived mobility, citizens' satisfaction; perceived ease of use and the attitude contribute significantly to citizens' actual use of m-government services at Saudi Arabia. The findings from the focus groups show additional important factors such as citizens' awareness and digital divide. Since Saudi Arabia and the other Arabic Gulf countries are facing the problem of low level of actual use of m-government services by the citizens, the outcomes of this research will help the officials and decision makers from Saudi Arabia and other countries with similar cultures to better position their strategies to encourage faster and more efficient adoption of these services.

This research suggests that there is a relationship between perceived ease of use and the actual use. Thus, the Saudi Arabian government should provide m-government services that are seen as easy to use. Carter and Belenger (2005), recommended diversification of the methods to increase the perceived ease of use. By echoing their recommendations, this study suggests the following:

Firstly, Saudi Arabia's government should provide online lessons through their websites to demonstrate how people can use and transact through these kinds of services. Secondly, Saudi Arabia's government should also improve the usability of the interface to enable people to effectively find the relevant information.

Finally, citizens' feedback about m-government services should be elicited and analysed. This will enable the Saudi Arabian government to redesign their services and to present m-government services in a way that is easier to be used. Saudi Arabia's government should also improve the usability of the Government Central Text Messaging System (Tarasol) to increase the effectiveness of communication and interaction between the government agencies and the beneficiaries from these services (including individuals and enterprises).

In addition to the above, the findings of this research support the research conclusions that the perceived trustworthiness has a positive impact on intention to use mgovernment services. Thus, it is important for Saudi Arabia's government to provide trustworthy services to its citizens. Citizens' trust ought to be ought to be gained by making sure that any m-government service does not experience technical faults that lead to frustration. The Saudi government should make sure that the different mgovernment services are protected properly.

This research also supports the fact that there is a relationship between the perceived usefulness and intention to use the m-government. Thus, it is necessary for the Saudi Arabian government agencies to include useful information and services into their websites and applications. The Saudi Arabian government should also employ training and promotion methods to improve people's beliefs of the usefulness and the value of the m-government services. Saudi Arabia ranked 36th on e-government development because the online portal offers A-Z government web indexes (as mentioned in Saudi Arabian Context chapter), so they are working right now to improve the Maak application to offer many services (from different government agencies) to citizens.

In addition, the findings of this research show that citizens' satisfaction had a positive impact on actual use of m-government services. Thus, the Saudi Arabian government should also support citizens' satisfaction through a range of activities which are based on the reliability and responsiveness. The Saudi Arabian government should also provide the kinds of services that are deemed valuable by people.

Moreover, the outcomes of this research showed that the reliability and the responsiveness had a positive impact on citizens' satisfaction.

Finally, the findings of survey support indicate that perceived mobility is a very important factor in the context of m-government. Thus, the Saudi Arabian government agencies should focus on "mobility" feature when they are providing their services (e.g. Maak product and the National Call Centre for e-government program (Aamor)), because this feature, will allow people to access these services from anytime and anywhere.

10.4 Limitations and Future Research

This study has developed a model and validated it using a large sample pooled from Saudi Arabian citizens. Nevertheless, like any other research, this study has certain limitations.

The first limitation comes from the sample population. My random samples are based on people who belong to academic environment (Universities), which is a more or less common practice. For example, Al Awadhi and Morris (2008), Abdelghaffar and Magdy (2012) used sample of students in their research in similar context, specifically with studying e-government and in Kuwait, Jordon and Egypt and in studying other technology adoption such as e-learning in Jordon (Abbad et al., 2009). The universities were chosen for this research because they are representative of the educated population in overall considerations and because the currently young university population is representative of the potential future users of m-government. The university students are sufficiently adept with electronic devices such as computers and mobile phones. The other consideration is the convenience of access. Babbie (1973) asserts that “it may be appropriate to administer the questionnaire to a group of respondents gathering at the same place at the same time". The author is familiar with the Saudi Universities and had the support from their administrations.

As this research mainly focused on the public sector, the outcomes were likely to be possible to extend to other public-sector organizations, e.g. to hospitals. This can be the part of future work and may lead to suggestions for the development of additional m-government services in Saudi Arabia.

This research is founded on cross-sectional data design, implying that the influence of the factors might not be reliable over time. Future research by employing a longitudinal design may check whether or not the citizens’ actual use of m-government services had changed over time.

Another limitation of this research is that research was conducted in Riyadh only, not including the other parts of the country. However, the city is suitable for the study because 25% of the general Saudi population live at Riyadh. The findings of this research could be extended to other cities in Saudi Arabia or even other Arab Gulf countries that have similar economic, social and cultural situations.

The aim of this study was to explain the citizens' actual use of mobile government in general, without focusing on specific applications or services. Some m-government services or applications could be of more value to the users than the other services, thus the scope of specific services and the task at hand may also affect their decision.

Finally, the questionnaire of this research is operationalised using validated items based on the prior literature studies predominantly written in English. This research has followed the common process in translation from English to the Arabic language, admitting a possibility of a slight alteration of the original meaning during the translation process.

This research has developed a model which is based on TAM with external factors: perceived service quality, citizens' satisfaction, perceived mobility and perceived trustworthiness. This model has been validated by using Structural Equation Modelling (SEM). In future study, the researchers may examine other effects of moderations on the actual use of m-government.

This research also has succeeded in developing and validating an instrument for measuring the variables involved, which will be useful to conduct the future research on the related topics.

The aims of this research are to provide help to Saudi Arabia, in the first place and other Arab Gulf countries that have similar economic, social and cultural situations. Thus, future research to compare the findings of this study with other developing countries may be of special interest.

Finally, this research method here could be similarly applied to specific m-government services. This study focused on the interaction process of government to citizens (G2C) and not looked at government to government (G2G) or government to businesses (G2B) services. However, further research may use the developed model to apply it to other categories (G2G and G2B) in the same context.

In light of the outcomes presented in the study here, the researchers and policy makers will be able to further consider the impact of various factors influencing citizens' acceptance of m-government services in developed and developing countries thus making the affected societies more efficiently functioning and this could lead to the availing of greater prosperity in future.

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Appendix 1: Ethical approval.


Ethics application has been approved

www-data [www-data@cis.strath.ac.uk]

To: Sultan Alotaibi

Inbox

Hello,

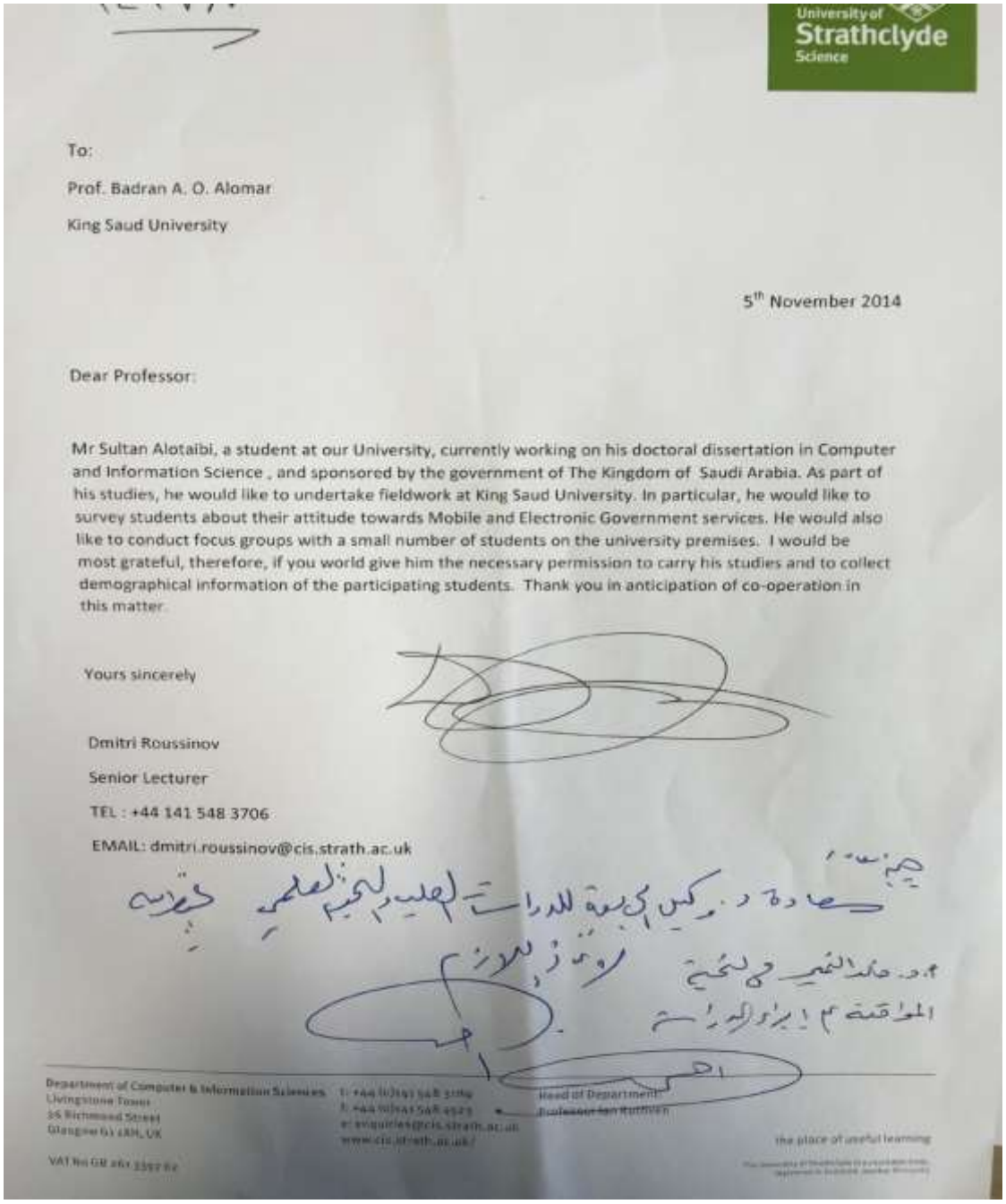
Your ethics application "Mobile government in Saudi Arabia: Attitudes and Perceptions " (ID: 273) has been approved.

URL: https://local.cis.strath.ac.uk/local/ethics/index.php?view=273

Ethics Approval System.

–

Appendix 2 The letter to King Saud University to get the approval



University of Strathclyde
Science

To:

Prof. Badran A. O. Alomar

King Saud University

5th November 2014

Dear Professor:

Mr Sultan Alotaibi, a student at our University, currently working on his doctoral dissertation in Computer and Information Science , and sponsored by the government of The Kingdom of Saudi Arabia. As part of his studies, he would like to undertake fieldwork at King Saud University. In particular, he would like to survey students about their attitude towards Mobile and Electronic Government services. He would also like to conduct focus groups with a small number of students on the university premises. I would be most grateful, therefore, if you world give him the necessary permission to carry his studies and to collect demographical information of the participating students. Thank you in anticipation of co-operation in this matter.

Yours sincerely

Dmitri Roussinov

Senior Lecturer

TEL : +44 141 548 3706

EMAIL: dmitri.roussinov@cis.strath.ac.uk

Department of Computer & Information Sciences
Livingstone Tower
26 Richmond Street
Glasgow G1 1XH, UK

Head of Department

the place of useful learning

Appendix 3 The letter to YESSER program to get the approval

University of Strathclyde
Science

Our ref: DR/zsm

Dr Abdulrahman Sulaiman
YESSER Program's Director

Wednesday 14 October 2015

Dear Dr Abdulrahman

E-government has become a popular focus of government efforts in many countries around the world. Saudi Arabia is one of those to implement e-government in its ministries and departments. Many factors must be taken into account when such programmes are implemented.

Mr Sultan Alotaibi, a scholarship student from Shaqra University, is currently studying for a PhD in Computer and Information Science in our Department. As part of his studies, he would like to undertake filed-work at YESSER Program.

His study aims to investigate the factors that influence the adoption of mobile government in Saudi Arabia. In order to achieve the desired goals, the researcher is conducting interviews with officials such as you, who are in a position to provide valuable information on mobile government and related data. We would like to invite you to be part of this study, which will help the researcher to identify the factors that influence the adoption of mobile government in Saudi Arabia. I assure you that all responses will be confidential. I would be most grateful, therefore, if you world give him the necessary permission to do this work.

Thank you in anticipation of co-operation in this matter.

Yours sincerely

Dmitri Roussinov
Senior Lecturer

TEL: +441415483706
Email: Dmitri.roussinov@cis.strath.ac.uk

Department of Computer & Information Sciences
t: +44 (0)141 548 3189
f: +44 (0)141 548 4523
Head of Department:
Professor Ian Ruthven
the place of useful learning

Appendix 4 Approval letter to conduct the study in King Saud University

جامعة الملك سعود
King Saud University

مكتب وكيل الجامعة
للدراسات العليا والبحث العلمي

المملكة العربية السعودية
ص.ب 2454 الرياض 11451
www.ksu.edu.sa

جامعة الملك سعود (034)
هاتف 08 01 467 11 966+
فاكس 99 79 467 11 966+

سعادة الملحق الثقافي السعودي في المملكة المتحدة **سلمه الله**

السلام عليكم ورحمة الله وبركاته

اشارة الى كتاب المبتعث/ سلطان بن رفاع العتيبي، رقم ١٦١٥٩ وتاريخ ١٤٣٦/٤/١٣هـ الملتحق بجامعة ستراث كلايد بجلاسكو بالمملكة المتحدة لمرحلة الدكتوراه في تخصص علوم الحاسب وتقنية المعلومات. وحيث يرغب في توزيع الإستبانة في جامعة الملك سعود بعنوان "قياس تصورات و تطلعات المواطنين نحو الحكومة الإلكترونية المتنقلة"

نفيد سعادتكم بأنه لا مانع لدينا من تطبيق الإستبانة في الجامعة.

ولسعادتكم تحياتي

وكيل الجامعة

للدراسات العليا والبحث العلمي

أ.د. احمد بن سالم العامري

–

Appendix 5 Approval letter to conduct the study in Imam Mohammed bin Saud University

بسم الله الرحمن الرحيم

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الإمام محمد بن سعود الإسلامية
وكيل الجامعة
للدراسات العليا والبحث العلمي

جامعة الإمام محمد بن سعود الإسلامية
رقم المعاملة: ٤٨٥٥٧
تاريخها: ١٤٣٦/٠٤/١٦
إرسالها: ١٤٣٦/٠٤/١٦
المرفقات: بدون

الموضـــوع: _____

المكرم الأستاذ سلطان بن رفاع العتيبي حفظه الله

سلام عليكم ورحمة الله وبركاته .. أما بعد :

فأشير إلى طلبكم إجراء استبيان لطلاب جامعة الإمام محمد بن سعود الإسلامية ضمن أعمال رسالة الدكتوراه التي تحمل عنوان " **التصورات والتطلعات نحو خدمات الحكومة الإلكترونية المتنقلة** "، نفيدكم بأن وكالة الجامعة للدراسات العليا والبحث العلمي لا مانع لديها من إجراءكم الاستبيان المذكور في الجامعة، والله يحفظكم ويرعاكم.

والسلام عليكم ورحمة الله وبركاته..

المشرف على مكتب
وكيل الجامعة للدراسات العليا والبحث العلمي

د. سامي بن صالح الرسيني

Appendix 6 The questionnaire (Arabic)

University of Strathclyde Glasgow

الحكومة الإلكترونية المتنقلة: المواقف والتصورات في المملكة العربية السعودية

أخي / أختي المشارك في هذه الاستبانة

أشكر لكم موافقتكم على المشاركة في هذه الاستبانة، حيث إنها تهدف إلى التعرف على اتجاهات المواطن السعودي نحو اعتماد الخدمات الحكومية المتنقلة. ويقوم بإجراء هذه الاستبانة احد طلبة الدكتوراه في تخصص علوم الحاسب الآلي ونظم المعلومات في جامعة (ستراثكلايد) وذلك بوصفه متطلباً للحصول على الدرجة العلمية.

لأغراض البحث أود عرض تعريف مختصر لمفهوم الحكومة الالكترونية المتنقلة:
تعرّف **الحكومة الإلكترونية المتنقلة** بأنها جهة تُعنى بتوفير الخدمات الحكومية عن طريق التكنولوجيا اللاسلكية، في أي مكان وفي أي وقت، باستخدام مجموعة متنوعة من الأجهزة النقالة.

وستكون مساهمتك في هذه الاستبانة محل تقديرنا وحاسمة في إنجاح هذا البحث. وجميع المعلومات المقدمة ستظل سرية وسوف يكون الباحث فقط لديه حق الوصول إلى جميع الاستبانات الكاملة. إذا كان لديك أي استفسارات أو تعليقات تتعلق حول الاستبانة يرجى التواصل مع الباحث.
لا توجد إجابة صحيحة أو خاطئة للاسئلة، إنما طريقة فقط للوصول إلى رأيكم، لذلك ستأخذ هذه الاستبانة 10-15 دقيقة لإتمامها. لذا سأكون شاكراً ومقدراً لكم إجابتكم عن جميع الأسئلة بحرية ودون تردد. تنقسم هذه الاستبانة الى قسمين، القسم الأول للحصول على معلومات عامة عن المشارك. والقسم الثاني لقياس رأي المشارك حول الحكومة الإلكترونية المتنقلة.

اسم الباحث: سلطان رفاع العتيبي
علوم الحاسب الآلي والمعلومات
جامعة ستراثكلايد–المملكة المتحدة
للتواصل مع الباحث:
sultan.alotaibi@strath.ac.uk

1

–

القسم الأول: معلومات عامة

الرجاء الإجابة على الأسئلة الآتية مع وضع علامة (X) واحدة فقط لكل سؤال. وباستطاعتك تقديم أي معلومات إضافية عند الطلب.

١ . الرجاء تحديد الجنس

ذكر	
أنثى	

٢ . ماعمرك؟

١٨-٢٠	
٢١-٢٣	
٢٤-٢٦	

٢٧-٣٠	
٣١-٣٥	
٣٦ فأعلى	

٣ . إلى أي كلية من كليات الجامعة تنتمي؟

- ◯ كلية العلوم
- ◯ كلية الصيدلة
- ◯ كلية طب الأسنان
- ◯ كلية الطب
- ◯ كلية العلوم الطبية التطبيقية
- ◯ كلية إدارة الأعمال
- ◯ كلية الآداب
- ◯ كلية الهندسة
- ◯ كلية العلوم الاجتماعية
- ◯ كلية الحاسب الآلي
- ◯ كلية التربية
- ◯ غير ذلك (يرجى التحديد).....

٤. ما أعلى مستوى تعليمي لك؟

- ◯ ابتدائي
- ◯ جامعي
- ◯ ثانوي
- ◯ دراسات عليا

٥. ما مهنتك؟

- ◯ طالب
- ◯ موظف إداري
- ◯ عضو هيئة تدريس

٦. تقريباً كم مرة تستخدم الهاتف المتنقل؟

- ◯ يومياً
- ◯ مرتين أو ثلاثاً في الاسبوع
- ◯ مرتين أو ثلاثاً في الشهر
- ◯ مرة في الأسبوع
- ◯ مرة في الشهر
- ◯ أقل من مرة في الشهر

٧. ما الأغراض التي تستخدم الهاتف المتنقل من أجلها؟

يرجى وضع علامة على كل مايطبق عليك

- ◯ التسوق الإلكتروني
- ◯ التواصل
- ◯ الخدمات الحكومية
- ◯ الإيميل
- ◯ الترفيه
- ◯ البحث عن المعلومات
- ◯ غير ذلك (يرجى التحديد).....

الفصل الثاني: قياس التصور حول الخدمات الحكومية المتنقلة:

٨. هل سبق لك استخدام أي خدمة من الخدمات الحكومية المتنقلة، مثل الحصول على بعض المعلومات من الجامعة عن طريق الرسائل النصية القصيرة أو الدخول على الخدمات الإلكترونية عن طريق الهاتف المتنقل؟

◯ نعم

◯ لا، إذا كانت الإجابة بلا، فمن فضلك لا تستمر في تعبئة الاستبانه، شكرا جزيلا.

تعد الجمل الآتية مؤشراً لقياس رأيك نحو الخدمات الإلكترونية المتنقلة. يرجى الإشارة إلى رأيك بوضع دائرة حول الرقم الذي يمثل أفضل اختيار لك.

١. لا أوافق بشدة
٢. لا أوافق
٣. محايد
٤. أوافق
٥. أوافق بشدة

٩. الجمل الآتية لقياس التصور حول فائدة استخدام الخدمات الحكومية الإلكترونية المتنقلة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
استخدام الخدمات الحكومية الإلكترونية المتنقلة ستكون مفيدة في حياتي اليومية.	١	٢	٣	٤	٥
استخدام الخدمات الحكومية الإلكترونية المتنقلة سوف يساعدني في إنجاز الأمور بسرعة أكبر.	١	٢	٣	٤	٥
استخدام الخدمات الحكومية الإلكترونية المتنقلة سوف تزيد من الإنتاجيه لدي.	١	٢	٣	٤	٥
استخدام الخدمات الحكومية الإلكترونية المتنقلة تساعدني في أداء الكثير من الأشياء بأكثر سهولة.	١	٢	٣	٤	٥

4

١٠. الجمل الآتية لقياس التصور حول سهولة استخدام الخدمات الحكومية الإلكترونية المتنقلة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
أتوقع أن تعلم كيفية استخدام الخدمات الحكومية الإلكترونية المتنقلة سيكون سهلاً بالنسبة لي.	١	٢	٣	٤	٥
أتوقع أن التفاعل مع الخدمات الحكومية الإلكترونية المتنقلة سيكون واضحاً ومفهوماً.	١	٢	٣	٤	٥
أود الحصول على الخدمات الحكومية الإلكترونية المتنقلة والتي تكون سهلة الاستخدام.	١	٢	٣	٤	٥
أتوقع أنه سيكون من السهل بالنسبة لي أني سأصبح مهارياً في استخدام الخدمات الحكومية الإلكترونية المتنقلة.	١	٢	٣	٤	٥

١١. الجمل الآتية لقياس التصور حول خاصية التنقل عند استخدام الخدمات الحكومية الإلكترونية المتنقلة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
أتوقع أن أكون قادراً على استخدام الخدمات الحكومية الإلكترونية المتنقلة في أي وقت، وفي أي مكان.	١	٢	٣	٤	٥
أتوقع أن الخدمات الحكومية الإلكترونية المتنقلة ستكون في المتناول بطريقة سهلة.	١	٢	٣	٤	٥
أتوقع أن الخدمات الحكومية الإلكترونية المتنقلة ستكون متاحة للاستخدام كلما كنت محتاجاً.	١	٢	٣	٤	٥
بشكل عام، أتوقع أني سأتحكم في استخدام الخدمات الحكومية الإلكترونية المتنقلة في أي وقت وفي أي مكان.	١	٢	٣	٤	٥

١٢. اجمل الآتية لقياس التصور حول جودة تقنية استخدام الخدمات الحكومية الإلكترونية المتنقلة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
أعتقد أن أي مزود للخدمات الحكومية الإلكترونية المتنقلة لن يكون مشغولاً إطلاقاً للاستجابة لطلبات المواطنين.	١	٢	٣	٤	٥
أعتقد أن مزودي الخدمات الحكومية الإلكترونية المتنقلة يقومون بتوفير الخدمات السريعة.	١	٢	٣	٤	٥
هناك استجابة جيدة من مزودي الخدمات الحكومية الإلكترونية المتنقلة.	١	٢	٣	٤	٥
مزودو الخدمات الحكومية الإلكترونية المتنقلة سوف يقومون بأعمال صادقة في حل بعض مشاكل المواطنين.	١	٢	٣	٤	٥
يوفر مزودو الخدمات الحكومية الإلكترونية المتنقلة الكثير من الأدوات السهلة لمتابعة الخدمة في حال طلبها.	١	٢	٣	٤	٥
التعاملات مع الخدمات الحكومية الإلكترونية المتنقلة تكون خالية من الأخطاء.	١	٢	٣	٤	٥
مزودو الخدمات الحكومية الإلكترونية المتنقلة يقومون بتوصيل أشياء معينة تعهدوا بتوصيلها في وقت معين.	١	٢	٣	٤	٥
مزود الخدمات الحكومية الإلكترونية المتنقلة يقدمون المساعدة المفيدة من خلال الرسائل النصية القصيرة.	١	٢	٣	٤	٥
استخدام الخدمات الحكومية الإلكترونية المتنقلة يسمح للمواطنين بسهولة تبادل الأفكار والآراء.	١	٢	٣	٤	٥
مزودو الخدمات الحكومية الإلكترونية المتنقلة لديهم ساعات تشغيل مريحة لجميع مواطنيها.	١	٢	٣	٤	٥
مزودو الخدمات الحكومية الإلكترونية المتنقلة على دراية بحاجاتي المحددة.	١	٢	٣	٤	٥

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١٣. الجمل الآتية لقياس مستوى الرضا عن الخدمات الحكومية الإلكترونية المتنقلة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
أنا راضٍ عن الجودة التقنية لخدمات الحكومة الإلكترونية المتنقلة.	١	٢	٣	٤	٥
أنا راضٍ عن المعلومات التي أتلقاها من الخدمات الحكومية الإلكترونية المتنقلة.	١	٢	٣	٤	٥
أنا راضٍ عن الطريقة التي يقوم بها مزودوا الخدمات الحكومية الإلكترونية المتنقلة التي تتكيف مع حاجاتي.	١	٢	٣	٤	٥
بشكل عام، أنا راضٍ عن الخدمات المقدمة من قبل مزودي الخدمات الحكومية الإلكترونية المتنقلة.	١	٢	٣	٤	٥

١٤. الجمل الآتية لقياس التصور حول الثقة عند استخدام الخدمات الحكومية الإلكترونية المتنقلة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
أتوقع أن الخدمات الحكومية الإلكترونية المتنقلة لن تأخذ مقابلاً مادياً.	١	٢	٣	٤	٥
أعتقد أن الخدمات الحكومية الإلكترونية المتنقلة جديرة بالثقة.	١	٢	٣	٤	٥
أعتقد أن الخدمات الحكومية الإلكترونية المتنقلة لن تعمل بطريقة سيئة لي.	١	٢	٣	٤	٥
أنا على ثقة بالخدمات الحكومية الإلكترونية المتنقلة.	١	٢	٣	٤	٥

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١٥. الجمل الآتية لقياس موقف المواطنين اتجاه استخدام الحكومة المتنقلة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
أن استخدام الخدمات الحكومية المتنقلة هي فكرة جيدة	١	٢	٣	٤	٥
تعد الخدمات الحكومية المتنقلة مفيدة لجميع المواطنين	١	٢	٣	٤	٥
تعد الخدمات الحكومية المتنقلة مثيرة للاهتمام	١	٢	٣	٤	٥
من الحكمة استخدام الخدمات الحكومة المتنقلة	١	٢	٣	٤	٥

١٦. الجمل الآتية لقياس نية الاستخدام حول الخدمات الحكومية الإلكترونية المتنقلة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
عند إعطائي الفرصة، سوف استخدم الخدمات الحكومية الإلكترونية المتنقلة.	١	٢	٣	٤	٥
من المرجح أن استخدم الخدمات الحكومية الإلكترونية المتنقلة في المستقبل القريب.	١	٢	٣	٤	٥
أن من المتوقع أن استخدم الخدمات الحكومية الإلكترونية المتنقلة في المستقبل القريب.	١	٢	٣	٤	٥
أنوي استخدام الخدمات الحكومية الإلكترونية المتنقلة عندما تسنح لي الفرصة.	١	٢	٣	٤	٥

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١٧. الجمل الآتية لقياس الاستخدام الفعلي للخدمات الحكومية الإلكترونية المتنقلة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
إذا تم تطبيق الخدمات الحكومية الإلكترونية المتنقلة سوف استخدمها بوصفها وسيلة أساسية في تعاملاتي مع الحكومة.	١	٢	٣	٤	٥
سوف استخدم الخدمات الحكومية الإلكترونية المتنقلة كونها بديلاً للطرق التقليدية في تعاملاتي مع الحكومة.	١	٢	٣	٤	٥
سوف استخدم الخدمات الحكومية الإلكترونية المتنقلة في أقرب وقت أستطيع فيه عمل ذلك.	١	٢	٣	٤	٥
عموماً، سوف استخدم الخدمات الحكومية الإلكترونية المتنقلة في السعودية إذا كانت متاحة.	١	٢	٣	٤	٥

١٨. في رأيك، ما العوامل الأخرى التي تؤثر على تبني الخدمات الحكومية الإلكترونية المتنقلة في المملكة العربية السعودية؟

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شكرا لك على وقتك ومشاركه في الاستبانة...

9

Appendix 7 – The questionnaire (English)

M-government: Attitudes and Perceptions in Saudi Arabia

Dear my brother/sister who is the participant in this questionnaire,

Thank you for agreeing to participate in this questionnaire, as it aims to identify the attitudes of the Saudi citizen towards the adoption of mobile government services. This is done as a requirement for obtaining a PhD degree in the field of computer and information sciences at Strathclyde University.

For the purposes of the research I would like to present a brief definition of the concept of **mobile government**:

Mobile government is known to provide government services via wireless technology, anywhere, anytime, using a variety of mobile devices.

Your contribution to this questionnaire is highly appreciated and critical to the success of this research. All information provided will remain confidential and only the researcher will have access to all full questionnaires. If you have any questions or comments regarding the questionnaire please contact the researcher.

There are no valid or wrong answers to the questions, they are the only way to reach your opinion, so this questionnaire will take 10-15 minutes to complete. I will be thankful and appreciate your answer to all questions freely.

This questionnaire is divided into two parts: the first section to obtain general information about the participant. And the second section to measure the opinion of the participant about the mobile government.

The researcher's name: Sultan Alotaibi

Computer and Information Sciences Department

Strathclyde University-United Kingdom

Email: sultan.alotaibi@strath.ac.uk

Section One: General Information

Please answer the following questions with one tick (X) only for each question. You may provide any additional information where requested.

1. Please indicate your gender:

Male	
Female	

2. What is your age?

18-20		27-30	
21-23		31-35	
24-26		36- Above	

3. With which college of the university are you in?

- ◯ College of Law
- ◯ College of Engineering
- ◯ College of Social Sciences
- ◯ College of Education
- ◯ College of Computer Science
- ◯ College of Business Administration
- ◯ College of Science
- ◯ College of Pharmacy
- ◯ College of Dentistry
- ◯ College of Medicines
- ◯ College of Applied Health Sciences
- ◯ Other (please specify).....

4. What is your highest level of education?

- ◯ Primary
- ◯ Secondary
- ◯ Undergraduate degree
- ◯ Post-graduate degree

5. What is your occupation?

◯ Student ◯ Academic Staff ◯ Administrative Staff

6. How often do you use mobile?

◯ Daily ◯ Once a week ◯ Once a month

◯ Two or three times a week ◯ Two or three times a month ◯ Less than once a month

7. For what purposes do you use the mobile?

(Please tick all that apply)

◯ Communication ◯ Shopping online

◯ Email ◯ Government services

◯ Information search ◯ Entertainment

◯ Other (please specify)……..

Section two: Mobile government services.

Mobile Government is defined as the "provision of government applications via wireless technologies, anywhere, anytime, employing a diversity of mobile devices".

8. Have you ever used any Saudi mobile government service, such as getting some information from your university via SMS?

◯ Yes
◯ No (If No, please do not continue this questionnaire, many thank)

The following statements provide an indication of attitude towards m-government services. Please indicate your opinion by circling the number which best represent your choice.

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

9. Perceived Usefulness	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Using "the mobile government services" would be useful in my daily life.	1	2	3	4	5
Using "the mobile government services" would help me accomplish things more quickly.	1	2	3	4	5
Using "the mobile government services" would increase my productivity.	1	2	3	4	5
Using "the mobile government services" would help me perform many things more conveniently.	1	2	3	4	5

10. Perceived Ease of Use	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I expect that learning how to use "the mobile government Services" would be easy for me.	1	2	3	4	5
I expect that my interaction with "the mobile government services" would be clear and understandable.	1	2	3	4	5
I would find "mobile government services" to be easy to use.	1	2	3	4	5
I expect that it would be easy for me to become skilful at using "the mobile government services".	1	2	3	4	5

11. Perceived Mobility	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I expect that I would be able to use "mobile government services" at anytime, and anywhere.	1	2	3	4	5
I would find "Mobile government Services" to be easily accessible and portable.	1	2	3	4	5
I expect that "mobile government services" would be available for use whenever I need it.	1	2	3	4	5
In general, I expect that I would have control over using "mobile government services" anytime and anywhere.	1	2	3	4	5

12. Service Quality	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I believe that any mobile government services provider is never too busy to respond to citizen requests.	1	2	3	4	5
I believe that mobile government services providers give a prompt service.	1	2	3	4	5
There is a good respond from any mobile government services provider.	1	2	3	4	5
Mobile government services provider shows a sincere interest in solving some citizen problems.	1	2	3	4	5
Mobile government services provider provides easy to use tools for checking on the status of an ordered service.	1	2	3	4	5
Transactions with mobile government services provider are error-free.	1	2	3	4	5
Mobile government services provider delivers on its undertaking to do certain things by a certain time.	1	2	3	4	5
Mobile government services provider offers a helpful assistance through SMS.	1	2	3	4	5
Using mobile government services allows citizens to easily exchange ideas and opinions.	1	2	3	4	5
Mobile government services provider has operating hours convenient to all its citizens.	1	2	3	4	5
Mobile government services provider understand my specific needs.	1	2	3	4	5

13. Satisfaction	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I am satisfied with the technical quality of mobile government services.	1	2	3	4	5
I am satisfied with the information I receive from mobile government services.	1	2	3	4	5
I am satisfied with the way in which mobile government providers adjust to my needs.	1	2	3	4	5
Overall, I am satisfied with the services offered by mobile government providers.	1	2	3	4	5

14. Trust	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I expect that mobile government services will not take advantage of me.	1	2	3	4	5
I believe that mobile government services are trustworthy.	1	2	3	4	5
I believe that mobile government services will not act in a way that harms me.	1	2	3	4	5
I trust mobile government services.	1	2	3	4	5

15. Attitude towards using mobile government	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Using mobile government services is a good idea	1	2	3	4	5
Using mobile government services is wise	1	2	3	4	5
Using mobile government services is beneficial	1	2	3	4	5
Using mobile government services is interesting	1	2	3	4	5

16. Intention to use mobile government services	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Given the opportunity, I will use mobile government services.	1	2	3	4	5

I am likely to use mobile government services in the near future.	1	2	3	4	5
I am willing to use mobile government services in the near future.	1	2	3	4	5
I intend to use mobile government services when the opportunity arises.	1	2	3	4	5

17. actual use of mobile government services	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
If m-government was implemented I would use it as a primary mean of transacting with the government	1	2	3	4	5
I would use m-government as an alternative to traditional ways of transacting with the government	1	2	3	4	5
I will use m-government services as soon as I can do so.	1	2	3	4	5
Overall, I would use m-government services in Saudi if they were available	1	2	3	4	5

18. In your opinion, what other factors affect the adoption of mobile government in Saudi Arabia?

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Thank you for your time and participation.

Appendix 8 – Participant information sheet for interview (English)

University of Strathclyde Glasgow

Participant Information Sheet for Interview

Name of department: Computer and Information Sciences Department

Title of the study: Mobile government: Attitudes and Perceptions in Saudi Arabia

Introduction:
My name is Sultan Alotaibi, I am from Computer and Information Sciences Department, and I am PhD student at Strathclyde University.

What is the purpose of this investigation?
This work aims to identify the attitudes of Saudi's citizen towards the adoption of mobile government services.

Do you have to take part?
Participation is voluntary and consent can be withdrawn at any time without providing a reason.

What will you do in the project?
I will be carrying out interviews in the interviewee's office during November and December 2015, and will visit interviewees to agree a date/time/location for interview. I will want to take note from the interview (with your permission) using a digital recorder, and download the recording to a PC and later write down on a 'word' document what is said at the interview.

Why have you been invited to take part?
I am interested in interviewing a range of people who are working in e-government project in Saudi Arabia. The sample size will be from 4 to 6. As you are working in this place, you may wish to be included in the study. No specific risks have been identified for participants in these interviews.

What happens to the information in the project?
Interview transcriptions will be anonymised (names will be changes) and kept in a secure, locked place, and/or on a password protected PC. I will not use participant's names in the dissertation, or name the region where you live/study, but I would like to use some quotes of what you say. To protect participants, the following steps will be taken with regards to anonymity and confidentiality of information:

1) In research papers the identity of the participants in the interviews will be kept anonymous. Different names will be used to refer to the participant in the coding.
2) Only I and the examination committee member will have access to the interview tapes and transcripts.
3) The interviewee will be given four weeks to communicate to the researcher any notes concerns or modifications. Once this four week period is over, it will be assumed that the interviewee agrees with the notes.
4) When a draft of a research paper is produced, and if the interviewee requests it, a copy will be sent for the interviewee to review.
5) The original tapes will be destroyed after the Ph.D has been awarded and that will be May 2017.

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What happens next?
With your agreement I will arrange to meet at a time and location suitable to you. We will go through this information leaflet and you will be given the opportunity to ask any questions about the research and about your own participation. You can choose not to participate without giving a reason at any time. If you would then like to take part in the study you should provide your written consent by signing the attached consent form. Please return this sheet to myself.

Researcher contact details:
Email: Sultan.alotaibi@strath.ac.uk
Tel: +447478495850
Address: 7 1 312 Meadowside quay walk
City: Glasgow
Postcode: G116AY

Chief Investigator details:
Email: Dmitri.roussinov@strath.ac.uk
Tel: +441415483706
Address: 16 Richmond Street
City: Glasgow
Postcode: G11XQ

This investigation was granted ethical approval by the University of Strathclyde Ethics Committee.

If you have any questions/concerns, during or after the investigation, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:

Secretary to the University Ethics Committee
Research & Knowledge Exchange Services
University of Strathclyde
Graham Hills Building
50 George Street
Glasgow
G1 1QE

Telephone: 0141 548 3707
Email: ethics@strath.ac.uk

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Appendix 9 – Consent Form for interview (English)

University of Strathclyde Glasgow

Consent Form for Interview

Name of department: Computer and Information Sciences Department

Title of the study: Mobile government: Attitudes and Perceptions in Saudi Arabia

- I confirm that I have read and understood the information sheet for the above project and the researcher has answered any queries to my satisfaction.
- I understand that my participation is voluntary and that I am free to withdraw from the project at any time, up to the point of completion, without having to give a reason and without any consequences. If I exercise my right to withdraw and I don't want my data to be used, any data which have been collected from me will be destroyed.
- I understand that I can withdraw from the study any personal data at any time.
- I understand that anonymised data cannot be withdrawn once they have been included in the study.
- I understand that any information noted in the investigation will remain confidential and no information that identifies me will be made publicly available.
- I consent to being a participant in the project

This research project is under the responsibility of:

Sultan Alotaibi, PhD Student at the University of Strathclyde in Glasgow.

Dr Dmitri Roussinov, the primary supervisor of this research.

(PRINT NAME)

Signature of Participant: Date: 2016

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Appendix 10 – Interview questions (English)

Questions for interview	Justifications
1. In your opinion, to what extent does the Saudi government support the mobile government project?	To see how much support does the Saudi government give to the of mobile government project. If there is a large moral and material support, then the government will be striving to move from the traditional government to mobile government.
2. What are the practical steps that you think they have been undertaken towards implementing mobile government?	To find out the processing and the executive tasks undertaken by the government towards the application of mobile government. When the drawn plans have been fully or partially implemented within scheduled time, then this will help to identify the success/fail of the application of mobile government.
3. Do you think that the public sector is well prepared to implement mobile government? And How?	To find out the quality of the environment surrounding the implementation, through the exploitation and use of information and communication technology to serve in the application of mobile government. This should help in execution speed.
4. The successful implementation of such project needs the cooperation of different public organisations within the country. How far do you see that this cooperation is applied?	To find out the extent of cooperation between public organizations with each other in the field of information technology, particularly the electronic government. The communication between public organizations will speed the access to the mobile government services.
5. Do you know how many mobile government services and how many subscribers are there?	To find out the number of services and the number of recipients of those services. This will help in the success of the project proportionally when compared to the number of Saudi Arabia's population.
6. Do you think that there are any barriers to use mobile government services? Can you please give examples?	To find out the barriers and obstacles preventing the completion of the project, from the viewpoint of those who are involved in this project. This helps to limit those obstacles and barriers, in order to work on finding solutions for them.
7. Do you think citizens find the use of Mobile government services more useful than traditional alternatives (going to physical place of the service provider)?	To evaluate usefulness of use mobile government.

8. Do you think citizens find it easy to use Mobile government services?	To evaluate easy to use mobile government services.
9. Do you think that citizens' attitude towards using mobile government services has impact on their intention to use them?	To evaluate citizen's attitude towards using mobile government.
10. Do you think that mobile government services will be available for use whenever citizen need them?	To evaluate the mobility of using mobile government services.
11. What do you think is necessary to get high quality of mobile government services?	To evaluate services quality of mobile government services.
12. Do you think citizens feel comfortable using the mobile when interacting with Mobile government services? How?	To evaluate citizen's trust of using mobile government services.
13. What role does the citizens' satisfaction play in adopting mobile government services?	To evaluate citizen's intention to use mobile government.
14. Do you think the number of citizens will be increased who using mobile government services in the future?	To evaluate citizen's intention to use mobile government.
15. In your opinion, which plans can be made for mobile government in future?	To find out the plans that the government intends to use for the future of the mobile government, in order to apply this project to the fullest.

Appendix 11 – Focus group questions (English)

Opening question:

Can you please tell us your name, age, the college and the department you are part of and in which year you are.

Questions	Justification
1) What do you think mobile government is?	To find out the definition of mobile government's from the point of view of citizens, and know the extent of their awareness about the existence of such services.
2) In your opinion, what are the advantages and the disadvantages of mobile government services?	To find out the desired benefits from the use of mobile government, and also find out the damages from the citizens' point of view.
3) In your opinion, what are the disadvantages of mobile government services?	To find out the damages from the citizens' point of view
4) Do you think that mobile government will help in limiting bureaucracy connections (wasta) in government work?	To find out the extent of their ability of transition from traditional government to mobile government, through controlling bureaucracy connections (wasta).
5) Do you think that using mobile government services is more useful than traditional alternatives (going to physical place of the service provider)?	To evaluate perceived usefulness.
6) Do you think that mobile government services are easy to use? How?	To evaluate perceived easy to use.
7) Do you think that mobile government services will be available for use whenever you need them?	To evaluate perceived mobility.
8) What do you think is necessary to get high quality of mobile government services?	To evaluate perceived service quality.
9) Do you think that trust has impact on the spread of mobile government services? How?	To evaluate perceived Trustworthiness.
10) What role does the citizens' satisfaction play in adopting	To evaluate users' satisfaction.

mobile government services?	
11) Do you think that the attitude towards using mobile government has impact on the intention to use these services?	To evaluate the attitudes towards using mobile government
12) Do you plan to use mobile government services in the future?	To evaluate intention to use mobile government.
13) What would you suggest to improve mobile government project?	To find out their views and suggestions in order to develop the mobile government project.