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FACTORS IMPACTING THE ADOPTION IN SAUDI ARABIA OF E-GOVERNMENT, INVESTIGATED WITH THE USE OF FUZZY SET QUALITATIVE COMPARATIVE ANALYSIS AND PLS PATH MODELLING

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FACTORS IMPACTING THE ADOPTION IN SAUDI ARABIA OF E-GOVERNMENT, INVESTIGATED WITH THE USE OF FUZZY SET QUALITATIVE COMPARATIVE

ANALYSIS AND PLS PATH MODELLING

BY

AHMED ALMAMY

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Author's Declaration

'At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without prior agreement of the Doctoral College Quality Sub-Committee. Work submitted for this research degree at the University of Plymouth has not formed part of any other degree either at the University of Plymouth or at another establishment. '

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Abstract

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Title of The Thesis: Factors Impacting the Adoption in Saudi Arabia of e-government, Investigated with the Use of Fuzzy Set Qualitative Comparative Analysis and PLS Path Modelling.

The rate of citizens' adoption of e-government (e-gov) is one of the prime indicators of the successful implementation of an e-gov system. An in-depth review of the existing e-gov adoption literature revealed that few studies had investigated e-gov generally in less advanced nations, especially in the context of Kingdom of Saudi Arabia (KSA). This study therefore aims to conduct an investigation into the adoption of e-gov and the factors that impact it from the citizens' perspective. An adoption model that integrates the Technology Acceptance model (TAM), Diffusion of Innovation Theory (DOI), the Trust model, and the cultural dimension (Uncertainty Avoidance) were proposed and validated. The study is conducted deductively and the model was quantitatively validated by surveying 630 citizens of KSA. The data was analysed by employing two statistical packages, Warp Partial Least Square "WarpPLS" and Fuzzy Set Qualitative Comparative Analysis "fsQCA". The findings of the study were that trust toward technology, trust toward government, relative advantages and perception of ease of use are significant antecedents of citizens' trust toward relation to e-gov webpages. Furthermore, trust toward e-gov webpages, social influences, relative advantages, compatibility and complexity significantly affect citizens' intentions to adopt e-gov. Interestingly, the findings of fsQCA, revealed no single variable strengthened citizens' intention, but that a combination of variables did so. The study presents three configurations are that were shared by 82%, 74% and 18% of citizens respectively. The findings of this research contribute theoretically by developing an e-gov adoption model that investigates factors from TAM, DOI, and Trust, with culture as a moderator. They also contribute methodologically by utilising fsQCA to investigate the combined influence and the interdependent relationships between those factors and to provide

different configurations of the factors given. The study also proposes practical managerial suggestions that could be considered as a guide to e-gov enhancement and promotion in KSA. Lastly, the limitations and the direction of further research are indicated.

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List of Acronyms

AAG	Arabic Advisor Group
APC	Average Paths Coefficients
ARS	"Average R-squared"
AVE	"Average Variance Extracted"
AVIF	"Average "Variance Inflation Factors"
CB-SEM	"Covariance-Based-"Structural equation modelling"
CFA	Conformity Factors Analysis
CITC	Communication and Information Technology Commission
COML	Complexity
COMP	Compatibility
DESA	"Department of Economic and Social Affairs"
DOI	"Diffusion of Innovations Theory"
E-gov	E-government
EOU	Perceived Ease of Use
fsQCA	"Fussy Set Qualitative Comparative Analysis"
G2B	"Government to Business"
G2C	"Government to Citizens"
G2G	"Government to Government"
G2N	"Government to Non-profit"
ICT	Information and Communication Technology
ICT	Information communication Technology
INTN	Intention to Use e-gov System
IS	Information Systems

ISSM	"Information Systems Success Model"
IT	Information Technology
KSA	Kingdom of Saudi Arabia
MCIT	"Ministry of Communication and Information Technology"
MM	"Motivational Model"
MPCU	"Model of PC Utilisation"
MPCU	"Model of Personal Computer"
RELT	Relative Advantages
SCT	"Social Cognitive Theory"
SEM	"Structural Equation Modelling"
SOCL	Social Influence
TAM	"Technology Acceptance Model"
TPB	"Theory of Planned Behaviour"
TRA	"Theory of Reasoned Action"
TRUG	Trust toward Government
TRUT	Trust toward Technology
TRUW	Trust toward E-gov Webpages
UNCT	Uncertainty Avoidance
USF	Perceived Usefulness
UTAUT	"Unified Theory of Acceptance Model"
VIF	"Variance Inflation Factors"

CHAPTER ONE

INTRODUCTION

1.1 Introduction

With the rapid development of technology, e-government (e-gov) has become more than the provision of services to citizens, organisations, businesses or government departments. Rather, it represents a revolutionary shift in societies. Consequently, e-gov and the practicalities of its adoption have inspired a great deal of debate. Despite the capacity of e-gov to transform society dramatically, many advanced and less advanced nations are facing challenges that hinder its adoption and its application (Savoldelli, Codagnone and Misuraca, 2014). This could be attributed to the mistaken view that findings and results in a particular context can be globally generalised in all other contexts, leading to the neglect of important issues that uniquely differentiate nations by assuming that all of them live in a single 'global village'. Every country has its own unique context, despite a few similarities that are common to all of them. Therefore, implementing e-gov using a single universal approach would be inefficient, ineffective and could prevent the aims and goals of implementing such system from being achieved. With the future vision of the country "2030" and the dramatic changes that are currently afoot, KSA is now eager to improve and enhance e-gov implementation and adoption. With its plans to reduce dependency on oil sources, to diversify the economy and cut costs, it is the intention of the country to enhance public governmental services for all beneficiaries, including citizens, businesses, and also between and within governmental institutions. However, despite a high degree of financial support for a set of strategic plans that aim to achieve the desired the application and the high rate of adoption that is expected, the results on the ground are not satisfactory. For the benefits of e-gov to be realised, the rate of adoption needs to be increased. Therefore, KSA needs plans and strategies that take into consideration its unique context and so for the great potential of e-gov to be realised.

E-gov is a comparatively new field of research and the factors that determine its successful implementation are controversial and require further investigation. This is one of the prime stimuli for conducting this study. The current chapter presents a brief background in respect to key issues regarding the adoption and implementation of e-gov and its services in KSA. It gives an overview of the research questions to be proposed, and the set of aims and objectives that correspond to those questions. Then, the significance of the research will be explained. It well then go on to a synopsis of the study methodology. Lastly, a simplified outline of the current study and the way it is organised will be given.

1.2 The Context of the Research

The advances of Information and Communication Technology (ICT) have dramatically transformed the ways that individuals, businesses and government communicate and transact among themselves and between each other (Baller, Dutta and Lanvin, 2016; Jorgenson and Vu, 2016). The development of the Internet compelled governments to enhance the mechanism of interacting with the public and this led to the formation of an e-society (Margolis and Moreno-Riaño, 2016). This dramatic shift sparked changes in the rapport between governments and their citizens through e-gov. With the realisation of the successful execution of e-commerce and its potential (Altameem and Almakki, 2017), many governments are now motivated to use technologies in replicating such success in order to effectively and efficiently manage the process of communicating and dealing with the public (Al-Shehry, 2009; Sheridan and Riley, 2006). In this way, governments and their beneficiaries can benefit from the prime goal of e-gov, which is its availability and accessibility 24 hours a day, 7 days a week (Altameem, 2007).

Several terms, such as electronic government and e-services, are used in the literature to describe e-gov. In the interests of consistency, the term e-gov will be adopted throughout this research. The various definitions found in the literature are the main basis of these studies, whether they refer to a general use of e-gov or a specific use of a sub-system, such as electronic tax returns. Some of these studies describe the delivery of orderly governmental services to a government's beneficiaries through the use of ICT (United-Nations, 2018). Definitions in other studies emphasise the prime features of egov as its accessibility and constant availability (Palvia and Sharma, 2007). E-gov is described by The World Bank (2011) as the utilisation of ICTs to enable changes in the rapport between and within government, their departments, and their public and private beneficiaries. Other sources describe e-gov from a management perspective, as a means of improving ways of managing and supervising governmental transactions with the public and maintaining a good rapport with beneficiaries (Fang, 2002). For the purpose of this research, e-gov is described as the employment of information and communication technology that has the aim of providing governmental services, particularly to citizens, by using different means to communicate, transact and request information; to promote a good rapport between governmental institutions and citizens and to offer a high standard of services. The majority of governmental services such as General Director of Passports, Pensioner Services, Civil Affair, Civil Defense including Traffic Department etc., are under one umbrella known as "Abshir" system and can be accessed from one place with a unite login information.

Also, according to the literature, the beneficiaries of e-gov are divided into four categories, namely "Government-Government (G2G)", "Government-Citizens (G2C)", "Government-Business (G2B)" and finally "Government-Employee (G2E)" (McClure,

2001; Tan, Pan and Lim, 2005). These categories will be discussed in detail in Chapter 2. Several services are provided for each of the four categories through the use of e-gov. Despite the significance of each category in a complementary environment, the existing literature indicates the importance of "Government-Citizens" category, as it is here that the e-gov system has its most important use (Jaeger, 2003). Yet, the unsatisfactory rate of adoption of the system and its services could be the mark of its failure (Savoldelli, Codagnone and Misuraca, 2014). This is due to the fact that, if citizens do not use the services, the enormous benefits of the system will never be realised. Several studies recognise the importance of citizens as end-users of the system and as a factor that determines whether its implementation is a success or a failure (Hu et al., 1999; Ozkan and Kanat, 2011; Rana, Dwivedi and Williams, 2015). Therefore, this study mainly focuses on the Government-Citizen category, including interactions, transactions and enquiries for information, as only a small number studies have investigated e-gov adoption from a citizens' perspective, particularly in the context of KSA. This study also considers factors that impact the density of citizens' adoption of e-gov in less advanced nations, particularly in KSA. According to Belanger and Carter (2008), e-gov is not limited to its technological effects; it also has an effect on issues related to society, organisation, and human culture, and these affect the rate of citizens' adoption.

A study conducted by Heeks (2006) revealed that, in less advanced nations, 35 percent of e-gov implementations were unsuccessful, half of them partially succeeded and only 15 percent were implemented successfully. According to the DESA (2008), the unsuccessful execution of e-gov is attributable to several issues, including the context of society and culture, weak technological foundations, trust-related issues, the accessibility and benefits of the services, and the mismatch between governments' requirements and their citizens' needs. These finding are not surprising, as they are in line with results of prior studies with regard to outcomes subsequent to the adoption of

such systems (Davis, Bagozzi and Warshaw, 1992; Dwivedi *et al.*, 2017; Rana *et al.*, 2017; Rana, Dwivedi and Williams, 2015). These previous studies highlighted several barriers, including perception of usefulness and perception of ease of use, as well as differing levels of access to contemporary technologies. The successful implementation of e-gov depended only 20 percent on the technologies used, and 80 percent of the successful implementation relied on individual and organisational operations (Shajari and Ismail, 2010). Globally, 80 percent of people reside in less advanced nations, yet only 20 percent of them use e-gov (Heeks, 2006). The high adoption rate of e-gov is a key measure of its successful implementation in less advanced and advanced nations and enables the benefits of the system to achieve full fruition.

The literature review of e-gov adoption revealed that the influence of culture has received little attention. Two cultural comparison studies between two advanced nations, namely the United Kingdom and the United States of America, were conducted by Carter and Weerakkody (2008). There is one cultural comparison study of an advanced nation (the United Kingdom) and a less advanced nation (Sri Lanka), conducted by Ali, Weerakkody and El-Haddadeh (2009). The findings of these studies indicated that differences in culture impact the adoption of e-gov. Another study in the literature, conducted by Arslan (2009), investigated the influence of culture in some European countries. A global comparison study was conducted by Khalil (2011) in order to discover the influence of cultural aspects in the predisposition to implement an e-gov system. According to Zhao (2011), all of these e-gov studies utilised Hofstede five However, Seng, Jackson and Philip (2010) used the Grid and culture-dimensions. Group Cultural Theory of Mary Douglas to identify factors that enable or hinder the adoption of e-gov. The findings of their study indicated that cosmology-hierarchism, individualism, equalitarianism and acceptance of the inevitable are found to affect the application of e-gov in the context of Malaysia. In Arab nations, Chatfield and Alhujran (2009) performed an e-gov comparative study of advanced nations and Arab nations, as well as a comparison between those Arab nations. The study indicated that there is huge gap in the level of access to contemporary technologies between advanced nations and Arab nations, as well as between particular Arab nations. However, little emphasis has been paid to the effect of cultural aspects on individuals' adoption of e-gov in respect to Arabic countries.

KSA is one of the less advanced nations that has been seeking since 2005 to exploit the technological revolution for the execution of an e- government system. Despite the lateness of the response, considerable progress has been made. According to the CITC (2010), the project was supported by huge financial and administrative capacities, including 7.2 billion dollars from the USA in 2010. This figure was further increased in 2015 to 12.3 billion US dollars. Several factors supported the adoption of e-gov in KSA, including an increase in the number of educated people as a result of an enhancement of educational institutions and the outcomes of scholarships for students in reputable universities in advanced nations. Other important social factors that encouraged the use of e-gov include gender segregation, the increased role of women in accordance with Vision 2030, and a hot climate. Despite such motivators, which were coupled with strong government financial and administrative support, an unsatisfactory adoption rate hindered the realisation of the system that was envisaged. Kranzberg and Davenport (1972) suggested that imported contemporary technologies were not the issue that needed to be addressed. Instead, a high degree of attention needed to be paid to the compatibility of those technologies with the culture, the society, the economy and the social factors that characterise a specific country.

For that purpose, the current study is an attempt to help to overcome problems related to compatibility by examining the cultural impact of citizens' adoption of e-gov in respect to KSA, with consideration of other related social factors. The current study utilises both the previous models of TAM and DOI, as well as the models of trust and risk, in order to ascertain the catalytic factors that affect individuals' adoption of e-gov systems in KSA. Culture also will be considered by utilising Hofstede's widely used cultural dimensions, particularly uncertainty avoidance, in developing a conceptual framework of the study and to recognise the prime factors that impact citizens' adoption of e-gov in KSA. Beyond that, the study also will examine the interdependent relationships between the factors studied in order to explain the combined influence of those factors and to provide other recipes that could help in increasing the rate of adoption.

1.3 Problem Background

An assessment was conducted by UNDESA (2012) that aimed to globally evaluate key areas of e-gov, including physical and organisational structures, technologies, the availability of human capital, e-participation and the services provided. This worldwide assessment concluded that a pattern of rapid e-gov evolution had occurred in KSA. It was ranked 41st in 2012 and 4th in 2018 among Gulf countries. This represented progress, as it had ranked as 41st in 2005. However, the result in respect to e-participation remained unsatisfactory compared to the development in other key areas of e-gov (United-Nations, 2018). KSA lunched a governmental committee, known as "Yesser", to perform a localised assessment that evaluated citizens' readiness to adopt an e-gov system. The assessment concluded that an unsatisfactory adoption level of 58 percent had been attained, despite citizens' high degree of awareness of e-gov systems and services (Yesser, 2011). The assessment also indicated that citizens were dissatisfied with the services provided, with 55 percent of users dissatisfied (Yesser, 2011). Since citizens are the primary users of the e-gov system, their perspectives clearly need to be given a good deal of attention if a high rate of adoption in KSA is to be achieved.

The literature review indicated that prior studies that had investigated e-gov in different contexts with the aim of finding the prime factors that influenced its adoption focused on citizens as prime beneficiaries of any improved design of the system (Choi et al., 2016; Dada, 2006b; Gunawong and Gao, 2017; Twizeyimana, Larsson and Grönlund, 2018). However, the process of redesigning a system to fit with citizens' needs is difficult work, particularly in less advanced nations (Choi et al., 2016). This can be attributed to the poor context and the sophisticated requirements for customised technologies that can be implemented in less advanced nations while taking into account the culture of those societies (Choi et al., 2016; Heeks, 2006; Scholl, 2007). A study conducted by Centeno, van Bavel and Burgelman (2005) was aimed to find the factors that promote citizens' use and adoption of e-gov. They concluded that five factors were important to the successful design of such a system, namely, citizens' perception of the system's advantages, the quality of the system, the ability to use the system, the availability of assistance, and catering for the needs of citizens through the provision of appropriate services. The latter was also emphasised by Heeks (2003), who found that it was the primary cause of unsuccessful correspondence between design and actuality.

Another study, conducted by Ali, Weerakkody and El-Haddadeh (2009), concluded that governments of less advanced nations who rely on outsourced specialists for the implantation of e-gov are less likely to inaugurate e-gov successfully, due to a lack of consideration for the unique cultural context. These specialists and the majority of outsourced technologies are mainly intended for, and manufactured in, advanced nations, and are prejudicially influenced by their own cultures and societies. These technologies, transplanted in less advanced nations without consideration of their social and cultural context, such as culture and society, can give rise to conflictual situations (Yavas, Luqmani and Quraeshi, 1992). Many studies have confirmed the strong influence of culture in the context of ICT, thus, it is more likely to affect the

implementation of e-gov, which in turn will affect citizens' attitudes to its adoption (Al-Gahtani, Hubona and Wang, 2007b; Arslan, 2009; Carter and Weerakkody, 2008; Venkatesh and Zhang, 2010). A potential solution for this dilemma is suggested by Corea (2000), who concluded that domestic ICT industries need to be fostered as an alternative to outsourcing from abroad.

Based on the review of the existing literature, it can be stated that only a limited quantity of the studies that have bought into focus the identification of factors affecting the adoption of e-gov in less advanced nations have taken into account the views of citizens, particularly in KSA. Despite the less attention that is given to studies in the context of KSA, other studies conducted in KSA are also suffer from limitation, and this will be discussed in depth in Chapter 2. One could suggest that findings from studies conducted in both advanced nations and less advanced nations that share certain characteristics with KSA might be relevant in a KSA context. However, even when there are obvious similarities, such as those of language, religion or a tribal system, such applications could lead to wrong conclusions and the mistaken implementation of inefficient and ineffective measures. A factor that was highly significant in one country might be unsuitable in another. An example of this can be seen in a recent study that investigated e-gov adoption in two advanced nations, namely the United Kingdom and the United States of America. The two countries have many characteristics in common, but it was demonstrated that variations were exist in respect of the factors that affect citizens' adoption of e-gov (Carter et al., 2016).

Although it is crucially important that culture-related issues and their impact on the implementation of a successful e-gov are understood, less attention has been given to those issues in the literature (Seng, Jackson and Philip, 2010). Recent studies have concentrated on comparing culture-related issues in various countries with regard to the advancement of technologies and the willingness to adopt them but have neglected the influence of the specific culture of a country on its adoption of those technologies. In general, the cultural in light of less advanced nations, Arab nations in particular, and its effect on individuals' adoption of e-gov, has received little attention. The present study addresses this shortcoming by examining the impact of the cultural context of KSA on citizens' intentions to adopt e-gov. It brings forward a conceptualised model that encompass other related factors. By considering both cultural literature and literature concerned with the adoption of technology, the study demonstrates that "citizens should not be blamed for failure to accept e-gov. It is the mismatch between culture and technologies that must be addressed.

Furthermore, existing studies of e-gov adoption in the literature either focus mainly on the impact of specific predictors of the intention to use e-gov services or fail to examine their combined influence. Despite calls in the literature to employ different analytical techniques and methods to enrich and widen the understanding of e-gov (Bagozzi, 2007; Lai, 2017; Lim, 2018; Pappas, Giannakos and Sampson, 2017), many of these studies employ analytical techniques that produce only one outcome or recipe. Such is the case with the studies of CB-SEM or PLS-SEM (Al-Hujran *et al.*, 2015; Alsulaimani, 2018; Horst, Kuttschreuter and Gutteling, 2007). These studies ignore the combined influences, the asymmetric link, the complementarity and interdependent relations between those factors that affect citizens' intention to use e-gov services. It is the combination of those predictors that best explain citizens' intentions, and by studying them it becomes possible to discover successful alternative solutions.

In view of the factors cited above, this research proposes that factors influencing citizens' adoption of e-gov in the context of KSA have not been adequately explored in the existing literature.

1.4 KSA Culture, Litracy and Computer Information Litracy:

Many cultural theories, including those of Hall (1959), Hall and Hall (1990), Kluckhohn and Strodtbeck (1973), Hofstede (1980) and Trompenaars (1994) have been applied in various contexts to differentiate one nation's culture from another's or to understand and investigate the effect on a culture of particular phenomena. For the purposes of present research, Hofstede's widely accepted theory of culture will be employed. These cultural dimensions are used for the differentiation between cultures of nations. These dimensions are Power Distance, Uncertainty Avoidance, Masculinity-Femininity, Individualism-Collectivism and Long Term Orientation. However, this research will focus on one of them, that is, the uncertainty avoidance dimension. According to Hofstede (2001), culture can be described as the cumulative coding of the brain which differentiates individuals that belong to a certain society from those who belong to another.

Hofstede investigated the cultural norms of IBM employees in 70 nations around the world. The author used the four dimensions cited above (Hofstede, 1980). Subsequently, the author conducted another study in 23 nations and these included another dimension, known as Long Term Orientation (Hofstede and Bond, 1984).

Uncertainty avoidance indicates the degree to which an that individual feels uncomfortable in a social context in respect to ambiguous situation and unknown outcomes and seeks to keep away from them and to avoid new ideas and unstructured situations (Hofstede, 1980). Such individuals fear unknown consequences and are reluctant to adopt any behaviour that is unfamiliar in their society. They prefer to face structured situations that are free from surprises and unexpected consequences (Hofstede, 1980). People in this category are also inclined to favour law-governed and strictly ruled environments to alleviate the anxiety caused by uncertainty. They tend to be more driven by emotions than those who live in a social context where uncertainty is more acceptable and who are more open to points of view other than their own. (Hofstede, 1980).

Masculinity-Femininity refers to the different social roles allotted to men and women (Hofstede, 1980). Hofstede's investigation of IBM employees in 70 nations around the world revealed that men' values were more varied than those of women in a given social context. The values of men are inclined to vary from dogmatic to ambitious. Men in a social context that places a high value on masculinity tend to be to be more dogmatic than females who share the social context. Thus, nations who are characterised by the high value given to masculinity display wider differences between their values and those of females (Hofstede, 1980).

Individualism refers to those who have only distant social or legal ties and expect to be largely responsible for themselves, their families and others directly related to them (Hofstede, Hofstede and Minkov, 2010). Collectivism, on the other hand, is associated with societies where people have strong social or legal ties and obligations and where members of society are expected to care for themselves and their tribe and their direct relatives, but are also integrated into wider social entities, and where the support is mutual (Hofstede, Hofstede and Minkov, 2010).

Al-Shehry *et al.* (2006), report that KSA has employed specialists and, competent professionals from developed Western nations to modernise and transform it. However. The social norms of Westerners may confront challenges in a Saudi social context. In the latter, the Islam religion, the traditions and the tribal and monarchical system have significant impact on people's daily lives. A study conducted by Al - Saggaf (2004) indicated the consequences of Internet adoption in the country raised great anxiety and much debate over issues such as the dissemination of pornographic material. Eventually, the authorities addressed the problem by centralising Internet sources so as to prevent access to pornographic content that could affect the social norms and culture of Saudi

society. A recent study of e-gov adoption in two less advanced nations, the Britain and the America, as we have seen, found differences with regard to the factors that influence citizens adoption e-gov (Carter *et al.*, 2016), showed that the role played by culture in the use of IT/IS related applications and end-users' adoption and acceptance of them is fundamental (Tam and Oliveira, 2019). Baskerville (2003) also suggested that cultural differences exist between individuals even when they live in the same country. These findings indicated the important of cultural and social factors in the application of e-gov, IT professionals from Western nations need to adjust to the social and cultural context if a high level of e-gov adoption is to be achieved.

Other important factors that influence the expansion and the adoption of e-gov are literacy rate and computer and information literacy. These factors proved to have significant influence on citizens e-readiness which in turn affect their intention to adopt e-gov (Alateyah, Crowder and Wills, 2013). Literacy in this context denotes the number of adult individuals who are able to read and write while computer and information literacy refer to their capability of using computer and information with sufficient knowledge about them (Fraillon *et al.*, 2019). Both rates of literacy and computer information literacy are influenced by citizens' educational level (Alateyah, Crowder and Wills, 2013).

According to UNESCO (2018), literacy rate in KSA of citizens aged between 15-24 has increased from 80% to 99.3% between the years 1990 and 2017. For those citizen aged from 65 and above, the literacy rate increased from 3% to 62.45% between 1990 and 2017. Based on the report of e-government survey published by United-Nations (2018), 60% of the citizens in KSA are online with a dramatic rise in e-literacy. Also, the report indicates that the use of social media by Gulf Countries including KSA is considered to be one of the highest globally. However, the report also noted that a forward movement from the simple integrated e-gov system and links is required. Transparency in KSA and Gulf Countries has received various criticisms despite their positive progress in this issue (United-Nations, 2018). Hence, the current study intends to investigate other issue that relate to trust and culture to explain the issue of low rate of adoption with such promising figures of literacy and computer skills. In the next section, therefore, questions relevant to the issue will be proposed and an attempt will be made to answer them appropriately.

1.5 Research Questions

Based on the conducted literature review, the following questions are proposed:

- RQ1. What are the factors affecting e-gov adoption in the context of KSA?
- RQ2. To what extent dose culture (Uncertainty avoidance) influence e-gov adoption in KSA context?
- RQ3. What are the configurations which lead to an increase in the adoption of egov in KSA?

1.6 Aims and Objectives of the Study

A primary aim of the current study is to identify factors that have an effect on citizen's adoption of e-gov in KSA through the investigation of aspects related to psychology, technologies, and society, with consideration cultural aspects to develop and validate a proposed conceptual model. However, the study also aims to extend further by identifying other recipes and configurations of those factors which lead to outcomes that increase the adoption of e-gov and by investigating the interrelationships between and among the factors that are identified. To achieve this purpose, the following objectives need to be met:

> To understand the existing state of e-gov in general, and in KSA in particular.

- To propose, in terms of the existing literature, a conceptualised model which encompasses the catalytic factors that impact the adoption of e-gov with reference to the viewpoints of citizens.
- Utilising a methodological design, method and analytical technique that help answering research questions and help evaluating and validating the proposed model in the context of KSA and identify other alternative recipes to that model.
- To present contributions to the existing literature of e-gov adoption in general, and of KSA in particular.
- > To provide practical recommendations to enhance the adoption of e-gov.
- To identify and provide implications of the study and to recommend further areas of research.

1.7 The Significance of the Research

The significance of the current study is attributable to the concentration on the factors which impact citizens' decisions in respect to the adoption of e-gov. It will also assess e-gov adoption in less advanced nations, particularly KSA. The culture of the country will be also considered, as it is believed to have an influence on Arab citizens, and especially Saudi citizens, during the process of deciding whether e-gov is to be adopted. Moreover, this study will attempt to overcome the deficiencies of previous studies that focus only on the direct effects of a causal relationship and neglect the combined, interdependent relationships between the factors that are studied, and thus fail to provide alternative recipes. None of these issues have been sufficiently explored, except the combined and the interdependent links between and among the studied factors, which is failed to be explored by previous studies.

It is expected that the outcomes of the present research will theoretically and methodologically provide contributions to the literature of e-gov adoption. It is hoped that it will also contribute practically to governments, managers and decision makers in tailoring e-gov systems and services that correspond more adequately to the needs of citizens. This would consequently help to increase the adoption rate of e-gov and so enhance its benefits to the community.

1.8 Contributions of the Research:

The current study seeks to contribute to the literature by examining and validating a model a of e-gov adoption in the context of KSA and to examine the limitations of previous studies. These limitations are further discussed in Chapter 2 section 2.10. The model also includes some factors that, to the best of the author's knowledge, have not been previously studied from the citizens' perspective, for example, through the examination of the degree of trust toward technology and trust toward government as antecedents of trust toward e-gov webpages as factors that influence citizens' intention to adopt e-gov. Furthermore, the effect of culture in the context of KSA will be examined, since little attention has been given to it in the literature.

The research also seeks to contribute to the e-gov literature through providing alternative configurations and solutions, using Fuzzy Set Qualitative Comparative Analysis (fsQCA) with "Structural equation modelling"(SEM). These contributions are the response to calls for the diversification of analytical techniques in the interest of shedding more light on the complex connections between the factors studied (Bagozzi, 2007; Pappas, Giannakos and Sampson, 2017; Pappas *et al.*, 2017). This approach will also help in understanding some of the inconsistencies and contradictory results that are to be found in the literature of e-gov (Alomari, 2014; Alsaif, 2014; Carter *et al.*, 2016; Choudrie, Alfalah and Spencer, 2017; Venkatesh *et al.*, 2003a). Clarification will be achieved by examining the individual influence of some factors on others. It will go further by examining the combined influences and interrelationship among and between
the factors studied. To the best of the author's knowledge, this study is the first to apply this methodological technique in e-gov literature in the context of KSA. The resulted configurations from this analytical technique could be of major assistance to governments and practitioners who are searching for alternative means of increasing egov adoption in KSA.

1.9 Synopsis of the Research Methodology

Based on the aims, objectives and research questions of several studies conducted in countries that are different from KSA, this research has adopted a positivist philosophy of research, which assumes that theoretical and conceptual frameworks can be developed to demonstrate causal relationships. A deductive approach will be employed for the formulation of the study's hypotheses in respect to the appropriate conceptual framework for demonstrating the factors impacting e-gov adoption in KSA (Bryman, 2016). For the collection of data from end-users of e-gov in KSA, a quantitative approach will be employed, and citizens will be surveyed using questionnaires (Bryman, 2016; Saunders and Lewis, 2000; Saunders *et al.*, 2011).

A in depth review to the existing literature is given prior to presentation of the proposed conceptual framework. An integration of three widely used models in IT/IS adoption, namely TAM, DOI, and Trust models will be undertaken. Culture (e.g. uncertainty avoidance) will also be integrated to investigate its moderating influence on citizens' adoption. A self-selection nonprobability sampling technique was used to gather data. One thousand citizens were the subjects of a survey. A total of 630 questionnaires were found to be usable. For the data to be deeply analysed, three types of software were utilised, namely SPSS, "WarpPLS", and "Fussy Set Qualitative Comparative Analysis" (fsQCA). The analysis was made by following the eight processes shown below (Figure 1.1).



Figure 1.1 Research Process

1.10 Outlines of the Research:

The research will be divided into seven chapters. A synopsis of each chapter is presented below.

✤ Introductory Chapter:

Chapter 1 presents a brief background in respect to key issues in the current study regarding the adoption and implementation of e-gov services in KSA. An overview of the research problem, the proposed research questions and the set of aims and objectives for response to these questions will then be discussed. Next, the importance of the study is elucidated, and a synopsis of the research methodology is presented. Finally, there is a simplified outline of the current study and of the way it is organised.

***** Literature Review Chapter:

Chapter 2 will present a review of the literature and will include a discussion of the issues identified within the e-gov field. It will begin with the definitions, categories, 19

motivators and obstacles of e-gov services. The previous studies of e-gov literature and evaluation of the existing literature will be presented in order to explore the gaps and deficiencies that need to be investigated in this study.

Conceptual Framework Chapter

Chapter 3 will include a discussion of the theoretical background of the adoption of technology, particularly the adoption of e-gov, based on a citizens' viewpoint. The discussion will explore and investigate previous studies in this field. The key factors impacting the adoption of e-gov will also be highlighted. Moreover, the effect of social influences and the effects of the culture will be investigated to better predict citizens' intentions to adopt e-gov in a developing nation such as KSA, where traditions, faith and religion play a significant role in people's lives, relationships and lifestyles. The research hypotheses will be developed and proposed. This will be followed by the presentation of a conceptual model, based on the previous discussion and investigation. The Conclusion at the end of the chapter will review the areas that have been previously discussed and presented.

* Methodology Chapter:

Chapter 4 presents the philosophical stance adopted in this study, the approach taken by the study and the methods employed. The chapter also discusses in depth the concepts underpinning quantitative methods and questionnaire surveys for data collection; it also addresses issues regarding the framing, samples size and sampling techniques. "Structural equation modelling"(SEM), "Fussy Set Qualitative Comparative Analysis" (fsQCA) and the procedure used for quantitative analysis are also explained. Finally, a discussion in respect to validity and reliability of the tools is presented.

✤ Data Analysis Chapter:

20

Chapter 5 addresses in detail the statistical procedures and exhibits the outcomes of data analysis obtained via the researcher's survey. This chapter opens with the preanalysis process that explains the data preparation, coding, cleaning and screening. It then proceeds to evaluate the non-response bias, followed by an explanation of the outliers. Next, multicollinearity is monitored and examined, and a normality test is performed and discussed. There is also an evaluation of the measurement model by means of an investigation employing confirmatory factor analysis. lastly, the study's hypothesises (structure model) are tested, by utilising "WarpPLS" and the Configuration Approach, which uses Fuzzy-set Qualitative Comparative Analysis (fsQCA), with its outcomes and solutions.

Discussion Chapter:

In Chapter 6, the empirical findings and the result of testing the research hypothesis in the analysis chapter will be discussed in detail, with consideration of the previous studies as well as the context of the research itself. The chapter will be divided to into two sections: the findings of the "WarpPLS" results in respect to the proposed research hypothesises and the findings of the fsQCA. The chapter will end with the presentation and discussion of the final research model and the conclusion.

Conclusion Chapter:

In chapter 7, the findings of the preceding chapter are presented and discussed. The chapter attempts to conclude the previous discussions and to present a synthesis of the major outcomes of the study. The responses to the proposed study's questions are highlighted and the key features of the research are discussed. Then, theoretical and practical implications are identified. Lastly, the shortcomings of the research are discussed and addressed, and further research directions are suggested. The following figure (Figure 1.2) summarises the structure of the research and the contents.

Research Progress

Introduction	Literature Review	Theoretical Research	Methodology and Research Design	Data Analysis and Findings	Discussion	Conclusion
 The Context of the Research Problem background Research questions Aims and objectives of the study Significance of the research. Synopsis of the Research Methodology Research's outlines 	-Background - Definition of e-gov. - Stages of e-gov. - Categories of e-gov. - E-Gov. & e-commerce - Motives of e-gov. - Obstacles of e-gov. - Prior studies in e-gov. - Literature Evaluation - Global assessment of e-gov. - E-commerce in KSA - KSA Culture	-Theories & Models of e-gov. Adoption - Development of the research hypothesis	 Research philosophy Research's approach Research's Methods Questionnaire Surveys The Design of the Questionnaire Translation Piloting the Questionnaire Determining the sample for this thesis Measurements Analysis Procedures for the Survey Questionnaire Fuzzy-set Qualitative Comparative Analysis (fsQCA) 	 Preparing Research Data and Collecting Procedure Pre-analysis of Data Processing Sample Size Structural Equation Modelling The Outer Model The Evaluation of the Structural Model A Configuration technique Utilising Fuzzy-set Qualitative Comparative Analysis (fsQCA) 	 Discussion related to research hypothesises The final proposed model of the research Fussy-set Qualitative Comparative Analysis discussion 	-Overview of the Study -Research Findings -Contributions made by the research -Theoretical contributions -Methodological contribution -Practical Implications -Limitations and Future Research

Figure 1.2 Research structure and Contents

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The previous chapter gave an overview of the thesis and the research gap, aims of the research and justifications for the research were identified. The research will answer three questions, and seven objectives have been identified for the purpose of answering them. Finally, the importance of the research is asserted, a methodology overview is given, and the numbered chapters of the work and a table of progress are presented for a clearer understanding of the research process.

In this chapter, the aim is to understand the existing state of e-gov in general, and particularly in KSA. There is a critical analysis of the literature and the gaps therein are identified and analysed.

This chapter will provide a review of the literature and will include a discussion about the problems associated with e-gov. It will begin with the definitions and will then examine the motives and the classification of e-gov beneficiaries. Then previous studies of e government adoption are reviewed and classified into two categories i.e., studies of less advanced nations and studies of advanced nations. There follows a critical evaluation of the issues in the literature that are to be addressed. Finally, the chapter present a global assessment of e-gov.

2.2 Definition of e-gov

The concept of e-gov can be traced back to 1993. Since then, the concept has been developed and is known as "electronic government", "e-gov" or "e-Gov". The term was introduced in the National Performance Preview (NPR) (Relyea, 2002). It was realised that Information and Communication Technology (ICT) could contribute significantly to the following: the enablement of a networked structure for interconnectivity, service delivery, efficiency and effectiveness, interactivity, decentralization, transparency and accountability. (Yildiz, 2007). This led to the emergence of a system of public administration that included all those functions. This system was commonly known as "e-gov".

For a full comprehension of the term, the roots of the word "government" need first all to be understood. According to Godse and Garg (2007), the word government refers to the Greek word "Kybernan" which means "to steer". It was widely used to refer to those who exercised authority, power, created laws and regulations to be obeyed by citizens and organizations (Dimitrova and Chen, 2006). In the modern world, the concept of government has changed, since stockholders such as citizens are involved in the decision-making process and in the creation of laws and regulations. Thus the concept of connected and networked government emerged and was further developed by the employment of ICT as a strategic and enabling tool for more effective and efficient public services (Bwalya and Mutula, 2014). Furthermore, the use of ICT, specifically the Internet, has made information and services available and accessible in an unprecedented manner, and has led to e-gov becoming widely used by stockholders (Napoli, Ewing and Pitt, 2008).

In spite of the advantages of e-gov, most nations in the glob continue to confront a variety of difficulties that impede its effective adoption and implementation. According to Moon (2002), e-gov is used in both less advanced and advanced nations, but there are significant gap in its implementation. Every single country in the world has its own circumstances; therefore, the application and implantation of a single model of e-gov could cause the fiasco of such project. Thus, cross-cultural studies are an important consideration for future research. The domain of e-gov remains insufficiently researched, particularly in less advanced nations. Thus, there is a need for further explanation, particularly of the ways in which it is defined, its advancement and the catalytic factors that determine the success or failure of such system.

The term "e-gov" comprises many disciplines, including information management, information systems, marketing and computer literacy, as well as public administration and the political sciences. This understanding may give an indication of the difficulties faced by many governments around the world in the transformation of government through the utilisation of ICT, especially the use of the Internet, to support the effectiveness of the medium and to provide new public services for citizens and businesses. Improved transparency and accountability are also important motives for governments to be involved in such a transformation (Akemi Takeoka and Jazem, 2015; Chen *et al.*, 2015).

Additionally, there are misunderstandings of the concepts of "e-gov" and "egovernance" and this has led to the terms being used interchangeably. According to Kustec-Lipicer and Kovač (2008), each concept is defined differently although each depends on the other. They assert that the concept of "e-governance" emphasizes the management tools and administration aspects, whereas, "e-gov" focuses on stakeholders themselves. E-governance moreover is a broader concept, which covers the application of information and communication technology in public sectors. Furthermore, it is related to the activities and processes that enable different actors in society to exercise power and authority. In contrast, e-gov is related to the expansion of online-services or the tool used to carry out those activities exercised by actors in society. Therefore, egovernance affects policies in general, whereas e-gov affects the implementation of these polices (Ayanso, Chatterjee and Cho, 2011; Calista and Melitski, 2007; Sheridan and Riley, 2006). Despite the recognition of the important role of e government in countries around the world, many of these countries still face challenges in its implementation and adoption (Avgerou, 2006; Belanger and Carter, 2008; Norris, 2010; Omar Al, Anas and Ikhlas, 2013; Rana and Dwivedi, 2015). There is no consensus among researchers on the definition of e-gov and many definitions have emerged since its introduction. This poses a challenge to researchers. In this thesis, e-gov refers to various communication media such as telephones, faxes, and mobiles, as well as the Internet, but the usage of the term e-gov in the World Wide Web is restricted to the Internet.

There are currently various difficulties that prevent many governments from realising the full benefits of the technological revolution, and more effort is needed if governments are to overcome such challenges. According to Al-khafaji, Shittu and Osman (2014); Chourabi and Mellouli (2011); Wang and Hou (2010), governments should not focus on the implemented ICTs, instead they need to concentrate on their work functions. These researchers emphasise the importance of building trust toward the relationship between governments and their beneficiaries. Thus, the process is not about ICT itself, but rather about the process of achieving radical changes of attitude among individuals, privately established businesses and enterprises, governmental departments and at the national level.

The advances in ICT and the Internet have created an opportunity for governments to improve the level of services provided to society via the adoption and reinforcement of e-gov. However, this rapid advancement of both ICT including the Internet has increased expectations, and so governments are under pressure to increase their efforts to improve public services (Alawneh, Al-Refai and Batiha, 2013; Karim, 2003; Müller and Skau, 2015).

A holistic understanding of the concept of e-gov is essential (Fogli and Provenza, 2012; Mainka *et al.*, 2013; Palvia and Sharma, 2007). The demand for such

understanding has raised the pressure on governments to take the initiative in increasing the use of ICT. Many studies argue, however, that most definitions of e-gov are narrow and incomprehensive of the concept and the duties of e-gov, and thus contribute to the failure of these initiatives (Dada, 2006a; Kor *et al.*, 2008; Lee, Chang and Berry, 2011; Ndou, 2004).

Different classifications have been introduced since the inception of e-gov due to the various perspectives and interpretations that have been applied to the study of the phenomenon. For example, Hirst and Norton (1998) proposed three elements for the definition of e-gov, namely internally related elements, externally related elements and relationality related elements. The "internal" element refers to transactions and activities among and between government departments and agencies: these are called "horizontal transactions". The "external" element includes the users' transactions with government and vice versa and are called "vertical transactions". The "relational" element is an integration of both previous elements. Consequently, Åke (2002, p.1) described e-gov as not just a technological transformation but rather as a renovation of operations and processes in respect of both internally managed processes and externally maintained and implemented services through the use of technological advancement.

There is a consensus that e-gov provides an improved delivery of government services to citizens, businesses and government agencies through the use of ICT, and especially the Internet. According to the World Bank (2011), e-gov and the use of ICT help to make a government's operations more transparent, more accountable, more effective and more efficient than the conventional approach. Another study states that egov is the activity of accessing government information, services and expertise through the use of the Internet in order to achieve efficient use of government functions and to enhance the satisfaction of citizens (Choudrie, Ghinea and Weerakkody, 2004). Such definitions have been criticized by Yong and Koon (2003) as they concentrate only on aspects of government reform for the achievement of an e-society. They suggest that more attention should be given to the reform process as well as the areas that affect such a process. However, others have defined the concept of e-gov through an emphasis on the relationship between different actors, including government agencies, businesses and citizens. For instance, Lee (2003) described e-gov as the provision of government information as well as services to stockholders, and emphasise the capacity of ICT and the Internet to provide ready access at all times.

Other approaches have defined "e-gov" from a single prospective, which has led to a lack of understanding and a narrowing of the concept. For example, Gartner (2007) states that e-gov is the transmutation of the internally and externally maintained rapports via the utilisation of network activities and Information and Communication Technologies (ICT) to help in enhancing the distribution of governmental services bodies of voters and intra-governmental practices. Gartner here emphasises a specific method, the use of ICT to transform government activities, internally and externally in order to enhance public services. Similarly, The United Nations (2010) described "e-gov" as the provision of information and public services to the citizens through the use of the Internet and the World Wide Web. However, the emphasis here is on technology as a means to reform and renew government activities.

Other researchers have expanded the definition of e-gov and classified it in accordance with other subdivisions, based on the function of each. According to Abramson and Means (2001, p.2), the term of e-gov refers to transactions and exchanges of information between stockholders (e.g. citizens, employees, businesses and government) by means of electronic interactions. However, the European Information Society (2004, p.20), defines e-gov from a management point of view, and regards it as the employment of Information and Communication Technology in the administration of all publicly related practices allied to organisational innovations that seek to improve

the standard of public services and democratic practices and to lend support to public policies. From the previous definition, it is clear that attention has been given to the political advantages as well as to the management of change. Consequently, four main areas of "e-gov" have been classified to encompass e-commerce, e-administration, e-democracy and e-services (Nordfors, Ericson and Lindell, 2006).

Similarly, for a comprehensive view, four main dimensions are deemed to be integral to the concept of e-gov (Ndou, 2004; Perri, 2004). These dimensions are:

- E-administration refers to the transformation of organisational administrative functions from traditional structures to computerisation and automation.
- E-citizens refers to the necessities that lead to the interaction between governments and their citizens, establishing trust and higher satisfaction with the service provided in order to realize its success.
- E-services refers to the availability and accessibility of the services.
- E-society refers to the use of ICT to maintain the relationship between government and other actors, such as citizens (G2C), businesses (G2B) and government agencies (G2G).

Thus, three dimensions overlay the e-gov system (Ndou, 2004; Perri, 2004) (see Figure 2.1). However, due to the re-engineering process, e-gov is not restricted to those dimensions and it depends on various governmental applications.



Figure 2.3 E-gov dimensions. Source (Ndou, 2004)

These classifications draw our attention to the importance of promoting the relationship between government and society, particularly in promoting political trust through the use of ICT as an enhanced interaction and communication method, as well as a means of renovating and reshaping the process of government (Alsaghier *et al.*, 2011; Seifert and Petersen, 2002; Tolbert and Mossberger, 2006). Therefore, the essential goal of governments in less advanced nations, including KSA, is to establish such trust in order to mirror the political aspects of e-gov (Abdelghaffar and Magdy, 2012; Meftah, Gharleghi and Samadi, 2015b; Shafi and Weerakkody, 2009).

Despite the consensus among researchers' definitions of e government that ICT is a means of transforming its operations, many definitions have emphasised the transformation method to fit a new model of public administration. Some studies have emphasised activities that include changing policies, government performance and the provision of services to citizens (Margetts and Dunleavy, 2002). Others have drawn attention to e-gov performance and its efficiency shift (Kaliannan and Awang, 2009), whereas some have merged transformation and ICT by emphasizing three general objectives (Gerald and Derek, 2005). These objectives are:

- The development and provision of more integrated public services of better quality.
- The effective management of the relationship component
- Nationally and internationally maintaining all developing objectives that relate to society and the economy for all government beneficiaries.

However, these definitions ignore the means of transformation and its availability, as well as the differing degrees of accessibility of public services in different channels. An additional definition by Abie *et al.* (2004) described "e-gov" as a powerful tool for knowledge management. Whitson and Davis (2001, p.79) described the purpose of egov as "implementing cost effective models for citizens, industry, federal employees, and other stakeholders to conduct business transactions online. The concept integrates strategy, process, organization and technology". This is a limited definition, but it fits some specific contexts and applications (Yildiz, 2007). Thomas and Okot-Uma (2001) considered the limitations of e-gov as a tool but asserted that its capability to be applied effectively to fit specific goals and contexts was the major source of its power.

Context is of great importance to the application of e-gov and the circumstances of less advanced nations require changes in its implementation (Hai, 2008). It is difficult to find a widely shared definition of e-gov among researchers. The theoretical background of the researchers, the context and the rapid development of technology have all influenced the variety of ways in which the concept has been defined. However, some elements are common to most of the definitions. There is, for example, an emphasis on technology and the use of ICTs as a mean of providing public services and information to stockholders. Secondly, there is also a frequent emphasis on government activities and their transformation as a means of enhancement of the way governments interact and communicate with stakeholders and provide them with services that fit their needs and expectations. Thirdly, there is a focus on the social, economic and political effects of egov. Fourth, there is emphasis on the provision of services and information to specific groups such as G2G, G2C, G2E and G2G. The next two sections discuss the various stages and categories of e-gov according to the existing literature. The following Table 2.1 summarises the most common and different e-gov definitions that exist in the literature.

Definition				Reference
Electronic	government	is	the	(Qu and Wang, 2009)
implementation of contemporaneous				

Table 2.1Definitions	of	e-gov
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ICT in an attempt to create integration	
between management and the public	
services by using networking	
technologies.	
Electronic government is the utilisation	(Heeks, 2008a)
of ICTs to enhance public services.	
The complete use of contemporaneous	(Silcock, 2001)
ICT by government to automate the	
handling of formal and public	
interaction.	
Improving, transforming and redefining	(Kurdi et al., 2011)
any type of organisational and	
governmental interactions with end-	
users by utilising a devoted local and	
global virtual and inter-organisational	
systems and arrangements.	
The use of ICTs by institutions to	(Pina, Torres and Royo, 2010)
perform service-related activities in an	
attempt to transform public sectors and	
improve their accessibility,	
accountability and transparency	
The transformation of all interactions,	(Arellano-Gault and Lepore, 2011)
transactions and information exchanges	
between and within government,	
businesses and citizens, by using ICT in	

the interests of greater effectiveness,	
transparency and accountability.	
Improving the effectivity of	(Vaidya and Campbell, 2016)
management, the delivery of the public	
services and the promotion of	
democratic values through the	
extensive use of ICT in governmental	
agencies.	
The delivery of government services by	(Ahmad, 2017)
governmental agencies through	
advanced ICTs such as WAN and	
Internet for better relationship between	
and among government departments,	
citizens and businesses.	
The provision of high accessibility and	(Arfeen and Kamal, 2014)
accountability of information use,	
government services to enhance the	
efficiency and effectivity of	
government by the mean of ICTs.	
Improving the accessibility and the	(Brković and Sretović-Brković, 2013)
delivery of governmental services to	
citizens, employers and employees	
through the use of the Internet.	
Enhancing and promoting the	(Trifonov, Tashev and Toteva, 2010)
governance of activities and the	
relationship with the public through	

governmental agencies' use of the			
Internet and its related applications.			
The utilisation of ICTs, particularly the	(Sang, Lee and Lee, 2009)		
Internet, to achieve transparent,			
effective, efficient and accountable			
interactions between government and			
society.			

2.3 Categories of e-gov

A detailed review of the literature reveals that, two approaches have been used to categorise and classify e-gov. The first one is based on the benefits offered by the e-gov system and the second one is based on e-gov project lifespan development or e-gov implantation level "e-gov stages. These two approaches to classification will be discussed in the next section.

Three general classifications have been introduced, based either on the interaction between government and stockholders or based on the actors who benefit from egovernment. These categories include "(G2C) Government to Citizens", "(G2B) Government to Business" and "(G2G) Government to Government" (Backus, 2001; Bonham, Seifert and Thorson, 2001; Holmes, 2001). Other studies have extended the view of e-gov and introduced two more categories: "(G2E) Government to Employee" (Ndou, 2004) and "(G2N) Government to Non-Profit Organisation" (Fang, 2002). There follows a brief description of these categories:

"G2C" relates to the electronic provision of information and services by governments to their citizens. An example of this category includes online voting and edemocracy as well as citizens' needs, such as online payment services, online appointment services and the renewal of passports and licences (Thomas and Okot-Uma, 2001; Ukot-Uma, 2004). In this category, citizens can go online to interact, communicate, and find information on government-related and citizen- related issues, thus enhancing citizens' engagement with their governments (Ae Chun *et al.*, 2012; Mossberger, Wu and Crawford, 2013).

"G2C" is seen to be the most important division in terms of e-gov implementation and the rate of adoption of such activities and processes (Ventura, 2008). The measurement of the success of e-gov is largely the number of citizens who adopt such programmes and become involved with them. According to Seifert (2003), with the advancement of ICT, current and future generations can be expected to interact frequently with e-gov systems as the main targeted users. In fact, in term of democracy, the ultimate goal of many governments around the world is to be citizen-centred as a result of the transparency offered by the G2C category. In this research, the focus will be on this category, which perceived as an efficacious approach for measuring the success of e-gov system. Notwithstanding the importance of other categories, G2C is the largest, as citizens' expectation and needs are continually changing. Therefore, the researcher has been motivated to conduct the research to investigate the catalytic factors that impact citizen's adoption and implantation of e-gov, which in turn will serve the vision of the Saudi government.

Other categories are classified as follow but they are beyond the focus of the current research. "G2B" relates to the interaction of government departments with the private sectors and business. According to Fang (2002), the provision of information, services and products to private businesses is the main purpose of G2B, although it will also improve and facilitate the online market place for government. The work of personnel has been simplified and streamlined since the introduction of the G2B category (Seifert, 2003; Ventura, 2008). Indeed, G2B has benefited from the past

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experience of online businesses, including e-commerce, particularly in terms of improved competition, lower costs and more satisfied customers.

"G2G" government-government relates to the engagements among and within government departments to each other. The G2G is the ultimate goal of many governments, as it leads to more centralized interactions. It allows government sectors to access a single point of contact, and consequently achieves reductions in terms of costs and time and leads to greater consistency(Seifert, 2003; Ventura, 2008). According to Behzadi, Isfandyari-Moghaddam and Sanji (2012), G2G is the essence of the e-gov system. It integrates the information of government, local institutions and the state to form a single database. However, since it involves the sharing of a huge amount of data and information between government sectors, a highly advanced technology is required.

"G2E" relates to interactions between government departments and their employees. Since the introduction of (G2E), the participation of government employees in the decision-making process has increased. This category is identified as a subcategory of G2G. However, Ndou (2004) has suggested that G2E should be separated from G2G because it deals with the relationship between government departments and their employees, whereas the latter deals with the relationship between those departments. Civil services are becoming paperless and the introduction of e-offices is an important contribution of this category (Fang, 2002). Therefore, it is important that government egov (Thomas and Okot-Uma, 2001; Ukot-Uma, 2004).

"G2N" relates to interactions between society, politics and associated governmental agencies. This category describes the exchange of information related to administrative activities and policies, data, law, political programmes and background information involved in decision-making. The information here is exchanged online between and among governments and a variety of organisations, agencies, discussion fora, communication in negotiations, decision making and interactions regarding administrative activities. Online transactions are also related to intra-organisational workflow, exchange polices and knowledge management online (Fang, 2002).

2.4 Motives of e-gov

Governments worldwide have come to realise the benefits of e-gov (Kaliannan and Awang, 2009; MAHDZUR and SALIM, 2015). The advantages of its adoption tend to be discussed with reference to stockholders (citizens, business and government departments), whereas few studies have investigated the effectiveness, difficulties and complications involved in implementing such systems. According to Bhatnagar (2004), the achievement of more effective and efficient e-gov requires a higher degree of transparency and the elimination of administrative corruption. He places emphasis on the delivery of government services and its crucial role on enhancing the performance of services to the public, and identifies reduced costs, the need for fewer intermediaries and the empowerment of citizens as other advantages (Nkwe, 2012).

One of the major gains of e-gov is with regard to the environment. The adoption of an online webpages for government forms, e-payment system and their availability leads to a dramatic reduction in paper use, printing and fuel consumption (Chavez, 2003; Horst, Kuttschreuter and Gutteling, 2007; Warkentin *et al.*, 2002). Also, the use of webpages has the effect of freeing up parking space, reducing queues in government offices and generally enhancing productivity. Indeed, the transformation to an information society, the convenience and the comfort offered by the use of such technology in the context of e-gov has had a favourable impact on the lifestyles of the general public and has raised the level of satisfaction in the services that are provided (Gautrin, 2004; Stiftung, 2002; Terpsiadou and Economides, 2009). Other researchers have suggested different reasons for the use of e-gov. Mulgan and Albury (2003) identified four further benefits. Firstly, the provision of services (Napoli, Ewing and Pitt, 2000) and information combined with the presence of technology in the day to day activities guarantees greater efficiency. Secondly, the use of ICT in e-gov helps to overcome problems such as population growth, diversity of culture and lifestyle. It increases mobility and also citizen's expectations and needs. Thirdly, the reduction in costs, the enhancement of accountability and transparency has dramatically increased the efficiency of governments in delivering services to stockholders. Fourthly, empowerment of citizens is of benefit to the social life of the community.

Chevallerau (2005) cites several advantages to citizens and government: the improved provision of information, time saved in work activities, reduction in the administrative work load, reduction of operational costs, enhanced level of service provision, increased efficiency and greater satisfaction for citizens. According to Bigdeli and de Cesare (2011), the achievable benefits of e-gov are reduction in costs, transparency and accountability, the development of an e-society, improved government decision-making and citizens contribution to e-democracy. Today citizens can participate in decision making. Also, the higher exposure of citizens to ICT has led to an increased familiarity with technology, and this could result in an expansion of ICT to other aspects of their lives (Ndou, 2004).

Misra (2007) classifies the advantages of e-gov in terms of its beneficiaries. The first of these are citizens, who enjoy convenient, faster and more efficient services, together with improved transparency and better accountability. The second beneficiary is business, which experiences reductions in working time and the benefits of improved quality, transparency and online financial transactions. The final beneficiary is the government itself, which experiences reductions in cost and time and an improved quality of decision-making.

A similar classification, asserted by Al-Shehry *et al.* (2006), is based on four aspects, namely political, economic, social and managerial. The political aspect relates to encouraging democracy by means such as online voting. E-gov also fosters an improved image of government by promoting better relationships, by enhancing trust between governmental agencies and individuals and motivating them to contribute to political decisions as e-participants.

The economic aspect is mainly related to the reduction in costs for government stakeholders and improving interactions between them. The social aspect emphasises the benefits gained from accessibility, the usability of online services and the provision of information. There is also an the improvement in -learning and training and services to elderly citizens and those with special needs. Finally, from the managerial aspect, the benefits include providing better and quicker decision-making, easier monitoring of the work process and reduction in administrative corruption and human errors.

However, the benefits gained from the adoption of e-gov are difficult to separate from one another, although it can be said that its transformative effects have been felt more in the private than in the public sector (Beynon - Davies and Williams, 2003; Sanchez *et al.*, 2003). The absence of ICT in the main activities of the public sectors has been detrimental to the latter. The way government serve citizens as well as the way private sector create businesses even the way citizens themselves perceive and expect what both of them offer have changed dramatically with the revolution of technology, especially the Internet (Koh, Prybutok and Zhang, 2008; Schelin, 2003; Silcock, 2001). Chandler and Emanuels (2002) are among those who have advocated greater use of technology in the public sector. Jain (2002) argues that technology is more than a tool, it is a source that can bring dramatic change and strength if it is applied effectively.

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Similarly, Elmagarmid and McIver (2001), state that the various complex activities related to government, whether political, economic or social, are more capable of fulfilling the needs and expectations of citizens than would be possible with the use of a traditional system. Metaxiotis and Psarras (2004) and Chandler and Emanuels (2002) concur by stating that traditional government with its hierarchical and centralized system fails to meet the needs and of citizens. Governments have the opportunity to exploit the use of a technology that offers such benefits to its citizens (Larsen and Rainie (2002). E-gov, however, is not a magical answer to all the problems faced by traditional means of government, it is a tool that requires effective implantation if it overcome the shortcomings of traditional systems (Atallah, 2001).

All the benefits that result from the application of e-gov constitute strong motives for its adoption. However, if it is to be successfully implemented, there are needs for a comprehensive understanding of its various categories and beneficiaries and of the problems surrounding its implementation.

2.5 Obstacles that Hinder e-gov Implementation and Adoption

It should be stated first all that the problems and constraints that surround the inauguration of e-gov are likely to be experienced in less advanced nations, which have been the locus of many unsuccessful applications (Rehman, Esichaikul and Kamal, 2012). Heeks (2008b) estimates that 35% of the less advanced nations that implement electronic governments were unsuccessful, 50% were partly unsuccessful and only 15% have successfully implanted such a system. The high percentage of failure is often due to the absence of a strong infrastructure, a shortage of skilled human capital and insufficient technological resources. The various barriers to the success of electronic government are discussed in the following section.

The Organisation for Economic Co-operation and Development OECD (2003) recognised four categories of constraint that hampers the implementation of e-gov. The first of these is the constraint due to is regulations and legislation, such as the policies that regulate online services, security measures and privacy policies that protect end users. The second category is budgetary constraint and is related to the current state of the infrastructure and the availability of the required resources. The third constraint is technological and is related to the readiness of governments to partake in a shared infrastructure. The fourth category is the 'digital divide', which relates to the accessibility and availability of electronic government and its resources among citizens. According to Nasirin and Papazafeiropoulou (2009), these constraints limit the scope of developing electronic government. However, the prime obstacle that restricts its implementation is more likely to be the lack of a well-developed ICT infrastructure as it is an essential pillar which supports the application as well as process of e-gov.

Davison (2006) places more emphasis on lack of effective management as a constraint on the successful implementation of e-gov. These managerial issues include improper management of time, money and the disparities between strategies and real work on the ground. Heeks (2003) classified these disparities as follows. The first, there are the 'hard' and 'soft' gaps: issues such as end-users' lack of awareness or lack of technological availability. The second consists of private and public gaps in delivering the needs of both sectors. The final gap is the one that exists between the requirements of government and the requirements of end-users. Other authors have concluded the prime constrains that hinder electronic government adoption and implementation e.g. Alateyah, Crowder and Wills (2013), Odat (2012), Al-Sobhi (2011), Heeks (2006) and Ndou (2004), and they agree to some extent on the existence of the ten constraints, which are discussed below.

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Constrains Related to Information Technology Infrastructure are concerned with technical issues associated with hardware, software and their related applications. There are a futrther four sub-categories. The first is deficicient hardware, outdated hardware and the need for consistant maintenance. Furthermore, the downloading and uploading speed of the Internet, especially in less advanced nations, is a significant constrain for end users. However, this issue could eventually diminish through improved technology. Among the main motives for adoption of e-gov is time saving and the accessability of the Internet among citizens needs to be limitless. The second category is software shortage. Outdated software and databases constitute significant constraints. Software needs to be updated constantly to cope with the rapid development of technology and to be compatible with the changing life styles of end users. Furthermore, databases need to be designed to cope with the high volume of end users'enquiries and interactions with government and, most importantly, needs to be constantly backed up. The third subcategory is the weak integration of government systems. Visions and goals need to integrated into government department so that end users are served effectivly and effecintly. Such weak integeration can lead to significant delays or even failure to provide the minimum standard of electronic services. The fourth sub-category is the decentralisation of the system. Decentralisation of government systems can lead to inefficient delivery of e-services, so system and databases need to be centralised, as otherwise the benefits of electronic systems are unlikley to be superior to the conventional provision of government services.

Security-related constrains can be technological or non technological. Although the lack of either is an obstacle to the successful implementation of electronic government, the latter plays a more significant role in less advanced nations (Karokola, Kowalski and Yngstrom, 2013; Rehman, Esichaikul and Kamal, 2012; Yang, Elisa and Eliot, 2019). Security concerns can be divided into four subcategories. The first of these is the security of end users' information. Vakeel et al. (2017) define information security as the extent to which end users' information cannot be seen, altered or changed without appropriate authorisation. Al-Maawali, Noronha and Kumar (2019) describe security in terms of a 'triangle', consisting of three elements: confidentiality, integrity and availability. A second sub-category is risk perception, which can be described as the concerns of end-users regarding the negative results of, for example, incorrect interactions or transactions (Alateyah, Crowder and Wills, 2013). Unskilled ICT endusers are more likely to pay attention to risk perception when personal information needs to be shared (Belanger, Hiller and Smith, 2002; Wang and Herrando, 2019). Another sub-category is related to end users' privacy. It has been confirmed that privacy in the context of electronic government is one of the main worries of end-users in their dealings with government (Liu and Carter, 2018), and failure to address such concerns tends to increase citizens' reluctance to adopt electronic government systems (Alateyah, Crowder and Wills, 2013). The final sub-category is end users' trust, which has been found to play an important positive role in reducing the perception of risk and fostering acceptance of IT/IS related applications (Al-Sobhi, 2011). High level of end-users' trust could help end-users paying less attention and help in reducing their anxiety when interaction occurs in e-gov and its related applications.

End-users' trust takes two main forms. First, there needs to be trust toward the Internet, and it is unskilled users and those with little knowledge of technology who display the most distrust and are therefore most likely to reject e-gov. The second major issue is a consequence of lack of trust toward government itself. This factor is connected to citizens' evaluation of the political party that controls the government and its ability to deliver the expected service (Belanger and Carter, 2008). There is empirical evidence that trust toward government is an essential predictor of citizens' intentions in advanced nations, such as the USA, however, less attention has been given to its role in

monarchical systems such as that of KSA (Belanger and Carter, 2008; Belanger and Carter, 2012).

Constrains related to availability, as we have seen, considered the most important charactaristics of e-gov are its perpetual availability 24/7 (Boyer-Wright and Kottemann, 2008). Availability of e-gov services to the public is a factor that has proved to increase citizens' confidence in government (Al - Busaidy and Weerakkody, 2009), and so leads to an increased usage of e-governemmt systems.

Other constrains are reviewed in the literature are constrains related to Accessibility. One of the primary goals of electronic government is to be accessable to all end-users, including those who suffer from disabilities (Kottemann and Boyer-Wright, 2010). The statistics show that there are more than 750 million people globally who suffer from disabilities (Scoxton 2015). In the United Kingdom alone, there are 1.7 million individials who have problems with eyesight. Hence, figures suggest that disability could hinder the adoption of e-gov and that a large segment of the population could fail to benefit from e-gov services if these issues are not addressed.

Unawarness is also a significant factor of the problem of low adoption of IT/IS and its related applications. In the context of e-gov, several studies have examined its effect on non usage of e-gov especially in the early stages of its adoption (Mohammed *et al.*, 2016). It is the responsibility of governments to ensure that citizens are aware of the services provided and they should devise appropriate strategies for the achievement of that purpose.

In less advanced nations, unskilled and unqualified government employees with lack of technical support have proved to be a significant hindrance to the operation of new projects that require the use of new technology (Goings, Young and Hendry, 2003). ICT skills are of two kinds, namely computer related skills and IS related skills. Computer related skills are the skills and knowledge required to operate computers. Several studies have confirmend that poor IT skills among end-users is one of the main obstacles to the use of e-gov (Choi et al., 2016; Odat, 2012). Some skills related to information security are normally necessary for the use of e-gov by end users. The acquisition of such skills would make an important contribution in creating confidence in the use of e-gov systems (Liu and Carter, 2018).

Poor design in terms of accessibility, and usability are major barriers to the use of e-gov services. Webpage design has been discovered to be a solid indicator of citizens' intentions to use government webpages (Alomari, Woods and Sandhu, 2012c).

The role played by culture in the use of IT/IS applications and end-users' adoption and acceptance of them is fundamental (Tam and Oliveira, 2019). In many developing Arab nations, religious and tribal systems have considerable influence in all aspects of social life (Abdullah et al., 2006). Several studies have sought to explain their effects on IT/IS use, adoption and implementation (Calhoun, Teng and Cheon, 2002; Leidner and Kayworth, 2006; Rose, Evaristo and Straub, 2003). An e-gov system that is suitable for one culture might be unsuitable for another. According to Baskerville (2003), cultural differences exist not only between countries, but also between individuals who live in a particular country.

The following Table 2.2 includes a list of the previously discussed constraints that hinder the adoption of electronic government.

Constraints	References
Constraints related to	Abmod (2017) Dutro at al (2018) Monsoh
Constraints related to	Animad (2017), Putra et al. (2018), Mensan
information technology	(2017), Das, Singh and Joseph (2017), Ndou
infrestructure	(2004), Brown and Thompson (2011)
Security related constraints	Alharbi, Papadaki and Dowland (2017),
	Dorogovs and Romanovs (2015), Hassan and
	Khalifa (2016), Cano (2016), AlKalbani, Deng
	and Kam (2015)
related to availability	Falco and Kleinhans (2018), Bawany and
	Shamsi (2015), Shah and Arfeen M.I (2017),
	Basamh, Qudaih and Suhaimi (2014), Khan,
	Khan and Zhang (2010)

Table 2.2	e-gov	constra

Constraints related to	Sonnenberg (2018), Al-Jaghoub, Al-Yaseen
accessability	and Al-Hourani (2010), King and Youngblood
	(2016), Galvez and Youngblood (2016)
Constraints due to	Mohamad and Kassim (2018), Alguliev and
unawarness	Imamverdiyev (2009), Al-Jaghoub, Al-Yaseen
	and Al-Hourani (2010), El-Haddadeh, Tsohou
	and Karyda (2012)
Constraints related to ICT	El-Haddadeh, Tsohou and Karyda (2012),
skills	Hwang et al. (2004), Dorogovs and Romanovs
	(2015), Hassan and Khalifa (2016), Cano
	(2016), Odat (2012)
Constraints related to web	King and Youngblood (2016), Lallmahomed,
design	Lallmahomed and Lallmahomed (2017), Kamal
	and Hackney (2012), Ahmad, Markkula and
	Oivo (2012), Al-Sobhi (2011), Abdel-Fattah
	and Ionas (2014)
Constraints related to	Tam and Oliveira (2019), Baskerville (2003),
cultural aspects	Abdullah et al. (2006), Alshehri and Drew
	(2010a), Bertot, Jaeger and Grimes (2010),
	Carter and Weerakkody (2008), Alzahrani and
	Goodwin (2012)

2.6 Previous Studies in e-gov Litrature

This section disscusses previous studies in the field of e-gov and is divided into two sub-sections according to whether the studies were conducted in less advanced nations including KSA or in advanced nations.

2.6.1 Studies of e-gov in Developing-Countries

Many underdevoloped nations suffer from an unsatisfactory level of technological adoption among citizens, even in places such as KSA, where there has been considerable financial support for ICT and its associated applicationss. There has been some research regarding the reasons (social, technological, organisational and economic) and why e-gov succeeds or fails in particular countries, including in KSA. Al-Gahtani (2003) utalised DOI to investigate the adoption and utilisation of computerised tasks by Saudi managers. It was found that adoption and usage were positively correlated. In addition, the capacity of those computerised tasks to be workable, observable compatible

and relatively advantageous correlated with the adoption by Saudi managers. However, the authors also found that the complexity of the system could negatively affect usage and adoption.

Another study of the willingness of Saudis to adopt computer desktops and their associated implementations was conducted by Al-Gahtani, Hubona and Wang (2007a). They gave their attention to factors that related to the cultural context, utilising UTAUT. Their findings revealed significantly different results with regard to Saudis and Americans. They found that expected performance and subjective norms correlated positively with individuals' intentions when it came to technological usage. With regard to the actual technological usage of individuals, there is no links between facilitating conditions, the expected efforts and the intention of usage. The utilisation of the Internet by Saudi professionals working in civil relations was also examined by Al-Shohaib *et al.* (2010) who employed DOI theory as the basis for their investigations. They found that autocratic decisions, processes and organisational motivations directly predicted the intentions of Saudis professionals, whereas, in private organisations, it was the relative advantages that predicted users' intentions.

A study that examined whether Saudis citizens are willing to adopt e-gov was conducted by Hamner and Al-Qahtani (2009) through surveing a sample of 453 respondents. They founde that citizens' acceptance is influenced by age, educational level and their knowledge of the Internet and of security. The authors hypothesied an egov system to conduct the study and the absence of a real-life system was a major limitation. Therfore, the study could be considered as a foundation for further research.

Alshehri and Drew (2010b) investigated obstacles that impede the espousal of egov by Saudis. Their results fell into five categories: obstacles related to (i) technology (ii) organisation (iii) society, (iv) finance, and (v) managerial support. Regarding technology-related obstacles, the authors stated that the solutions involved trustworthiness, improved security and privacy measures and a well-developed Information and Communication Technology foundation. The obstacles related to organisation included weak strategies, weak recognition and marketing of the advantages of e-gov, a lack of cooperation and involvement on the part of governmental institutions and the absence of well-developed regulations and policies in respect to e-gov. Al-Solbi and Al-Harbi (2008b) also investigated the preparedness for e-gov of the Saudi authorities and its civic policies. They concluded that rational evaluation of e-gov preparedness must concentrate on the significance of establishing usage regulations

Another study by Weerakkody *et al.* (2013) used a modified UTAUT with the intgeration of trust towards intermediaries and the Internet as a median to inspect the part played by intermediary in the diffusion of e-gov among Saudis. A total of 502 respondents were surveyed and SEM was used to analyse the data. The findings of the study indicated that dissimination of e-gov among Saudis was positivly affected by intermediaries. On the basis of their findings, they recommended that intermediaries should be established in other regions of KSA to increase awarness and to assist people in performing e-gov interaction, transactions and enquiring for information. They also found that the participants intentions were affected by performance expectancy, effort expectancy, and their trust toward intermediaries, although intention were not significantly affected by social influences and trust toward the Internet.

Alateeyah, Crowder and Wills (2014) performed a research in KSA which intended to find the factors affecting the adoption of e-gov. They surveyed staff and experts who worked in government in an attempt to rank the importance of the proposed factors from a different perspective from that of ordinary citizens. The findings of their exploratory study concluded that the following factors were statistically significant: culture, the usability of the system, the accessibility of the system, its advantageousness and compatibility, the perceived image of the system, its complexity, computer related skills and knowledge, gender, educational level, technological foundation, weak e-gov recognition, level of quality of services, the reliability of the system, its ability to deliver, the quality of the information and multi-lingualism. However, the surveyed e-gov experts did not accept multilingualism as significant. It is thought that the proposed model was in need of validation.

In a similar vein, Alshehri, Drew and Alfarraj (2012) surveyed information technology employees and citizens in KSA to rank the barriers to the adoption of e-gov. They found incongruence in the ranking of the proposed barriers between information technology employees and citizens, with the exception of the categories of lack of support and lack of knowledge. Information technology employees ranked "weak information technology infrastructure" as the third most important barrier, but, citizens ranked the absence of a reliable and available services from Internet services providers as the third most important barrier. As the sample used in the study was composed of old government employees, the results were confirmed by Alateeyah, Crowder and Wills (2014) as they also surveyed a similar sample of the characteristics of information technology employees.

Appeals for the development of an appropriate model of e-gov in KSA are widespread in the literature, Alghamdi and Beloff (2014) divided the factors which impact the adoption of e-gov into four sub-categories: factors related to personality, factors related to technology, factors related to motivation and factors related to reliability. However, the development of the model was based only on the existing literature. They subsequently validated the model using businesses as a sample unit of measurement instead of citizens .

A model derived from Diffusion of Innovation theory was proposed by Al - Ghaith, Sanzogni and Sandhu (2010) to investigate the factors that have the most influence on e-gov adoption from the individuals' perspective. They concluded that complexity, compatibility, and privacy were the factors that had the strongest effect on adoption. Gender, Internet service quality and relative advantages were also found to significantly influence adoption.

Choudrie, Alfalah and Spencer (2017) developed a model based on the same theory of Diffusion of Innovation. However, they modified the model by adding factors from other theories, namely, Attitudinal-Formation (Learning-Theory) and a Trust and Risk model. The sample of their study targeted elderly people in a particular region of KSA known as Haiel. They concluded that perceived assistance with webpages, compatibility, complexity, trust toward the Internet, and risk perception do not significantly influence those citizens' intention to adopt e-gov. Moreover, citizens' disposition to trust is a significant predictor of both citizens' trust toward the Internet as well as towards the government, and both of these factors were found to be significant antecedents of risk perception. However, their study was limited by the targeted sample as it is only represented one region (Haiel) and only one group (the elderly). This also applies to the study of Weerakkody *et al.* (2013) in the same context, as previously discussed. Al-Adawi, Yousafzai and Pallister (2005) conducted a study of a model of e-gov adoption related to the TAM and Trust and Risk model. However, they detached citizens' intention to transact from citizen's intention to enquire for information through an e-gov were correlated to risk perception, trustworthiness, perceptions of ease of use and perceptions of usefulness.

Despite the limitations of previous studies, there is a degree of consistency in their findings. For example, the complexity factor has been found to constantly and significantly influence citizens' intention to adopt e-gov in the various groups that were studied (Al-Ghaith, Sanzogni and Sandhu, 2010; Choudrie, Alfalah and Spencer, 2017; Weerakkody *et al.*, 2013). Compatibility was also found to be a constantly significant factor in these studies. In contrast to the previous studies in the context of technology acceptance by the elderly and also the studies of e-gov adoption in KSA, the construct of Diffusion of Innovation Theory (relative advantages) does not have a significant influence. This difference could be explained by the differences in the targeted samples.

Alharbi, Papadaki and Dowland (2017) investigated the influence of perceptions of security and its antecedents on users' intention to adopt e-gov. The fact which security was the focus distinguished this research from other studies conducted in respect to KSA. They developed a model in accordance with UTAUT2, and a Trust and Risk model that included

security and privacy. After surveying a sample of 625 citizens, they concluded that users' interface quality, cybersecurity regulations, as well as the security culture were strong antecedents of citizens' perception of security and privacy, and perception of privacy and security were significant predictors of trust. Their findings also indicated that citizens' trust, habits, performance expectancy, social influence, as well as facilitation conditions influenced their decisions to adopt the system whereas general information on security awareness did not significantly influence citizens' perception of security. Contrary to the expectations of the researchers, the tangibility of security negatively influenced citizens' perception of it. Although this study took place in KSA, its findings were not consistent with previous studies of e-gov adoption in that country, particularly the result with regard to effort expectancy. This contradicted the findings of Weerakkody et al. (2013), Al -Ghaith, Sanzogni and Sandhu (2010) and Choudrie, Alfalah and Spencer (2017). This contradiction, however, could be explained by the fact that the surveyed sample of Alharbi, Papadaki and Dowland's was confined to citizens who had already experienced the e-gov system in KSA. Furthermore, they investigated continuing usage of the system and previous usage.

Several studies have been conducted in countries other than KSA that share characteristics with KSA such as language, religion, a tribal system and to some extent cultural characteristics. For example, Fakhoury and Aubert (2015) investigated the roles played by trust and active citizenship on the intentions of Lebanese users to adopt e-gov. A field survey was conducted of 192 citizens and it was concluded that these two forms of behaviour, rather than technical factors, had the greatest impact on their intentions to adopt e-gov.

The existing literature additionally includes studies conducted by Jordan, Alomari, Woods and Sandhu (2012c), which developed a model that made integrated use of TAM and DOI theories to identify factors impacting Jordanians' adoption of e-gov. The data was then statistically analysed using a multiple-regression technique. The findings indicated that trust
toward government, beliefs, webpage-design, complexity, as well as perception of usefulness were strong indicators of the intentions of Jordanian users to adopt e-gov, whereas trust toward the Internet, relative advantages, compatibility as well as perception of ease of use were not important indicators.

Also in Jordan, a model in accordance with the Technology Acceptance Model (TAM) was used by Al Khattab *et al.* (2015) to investigate citizens' adoption of e-gov. They surveyed 170 Jordanians who had previously used e-gov. The findings of the study indicated that perceptions of usefulness, perceptions of ease of use, and trust toward e-channels positively affected the intentions of these citizens, while their perception of risk was negatively affected. Furthermore, it was indicated that perception of ease of use positively affected Jordanians' perception of usefulness, validating the applicability of TAM in such a context. Also, perception of risk was negatively influenced by trust toward e-channels. Two hypothesised relationships were not supported, namely trust toward government and risk perception and trust toward government and behavioural intentions. However, their findings contradicted those of Alomari, Woods and Sandhu (2012c) in respect of the relationships between citizen' intentions-citizens' trust toward government and citizen' intentions-citizens' trust toward the Internet. This contradiction could be attributed to the differences in the targeted population, as Al Khattab *et al.* (2015) surveyed adults aged 30 and below, whereas the other researchers surveyed adults aged 46 and above.

Abu-Shanab (2015) also surveyed 878 participants to examine Jordanian citizens' intentions regarding the use of e-gov. The data was collected from different groups, namely employees, business people, and university students, although participation was restricted to those who had previous experience of e-gov. It was concluded that transparency (information quality and information accessibility), accountability, collaboration, and empowerment significantly determined Jordanians' intentions to employ e-gov webpages. A modified model that rested on Technology Acceptance Model (TAM) and Trust and Risk Model was proposed by Al-Hujran *et al.* (2015). This model too was applied in Jordan.

Exceptionally, this model also integrated the cultural dimensions proposed by Hofstede (2011). They surveyed 413 Jordanian participants to investigate e-gov adoption. The findings of SEM analysis indicated that Jordanians' perception of public value and attitude are strong determinants of their intention to use. Furthermore, Jordanians' perception of ease of use and their perception of public values positively affected their intentions to use e-gov. It was additionally revealed that Jordanians' perception of ease of use and public values were strong predictors of attitudes to e-gov. A strong effect on Jordanians' perceptions of public values and perception of ease of use was also exerted by Trust. Lastly, cultural dimensions (Uncertainty Avoidance) strongly and positively influenced Jordanians' perceptions of public values and their perception of ease of use.

To summarise previous discussion of e-gov adoption in developing Arabian countries that share a number of significant characteristics, the major issues are listed below:

- Most of the studies that have been cited concentrate on issues related to the society and technology of the targeted country.
- Most of the studies concentrate on the direct relationship to the intention of adoption, and less attention is given to the indirect relationship and the effects of those factors.
- Despite the important role played by culture in different studies, such as the acceptance of technology, less attention has been given to the cultural dimensions of e-gov adoption, although cultural aspects were investigated by (Al-Hujran *et al.*, 2015). Another study by Alsaif (2013), that investigated the cultural role of avoidance of uncertainty produced explanations in the context of the Trust construct; individualism was explained in the context of social interdependency, and the tribal system was explained as a social norms, whereas power distance was explained as a factor in the digital divide.
- Several studies have been conducted in the literature with respect to the influence of trust in government and trust in technology; however, the findings were contradictory not only between countries but also between different samples'

groups who live in the same country e.g. (Carter and Belanger, 2004b) Carter and Bélanger (2005a) and Carter *et al.* (2016). The effect of trust toward government in KSA was examined by Choudrie, Alfalah and Spencer (2017). However, their investigation was limited to older KSA citizens. Among the limitations of previous studies of trust toward technology conducted in KSA was that they targeted precise region (Alateyah, Crowder and Wills, 2013; Alomari, Woods and Sandhu, 2012b; Alomari, 2014; Alomari, Sandhu and Woods, 2009; Choudrie, Alfalah and Spencer, 2017; Weerakkody *et al.*, 2013), and were not representative of all genders and all age groups. Therefore, the future study needed to target different ages, genders and geographical locations, with samples that sufficiently large to be representative.

Several studies have been conducted in less advanced nations that are different from Arabic countries and KSA. It is crucial to review them in order to gain a comprehensive understanding of the catalytic factors that influence the adoption of egov. Some of the countries categorised in this section as less advanced nations might be considered as advanced nations. Such is the case with China.

A model derived from Social Cognitive Theory (SCT) was proposed by Dwivedi *et al.* (2017) to identify factors involved in the intention of Indians to adopt a sub-e-gov system. The system used is known as the Online Public Grievance Redressal System (OPGRS). They called the proposed model the Unified Model of E-gov Adoption (UMEGA). After surveying 337 citizens from seven different regions they found that performance expectation, effort expectancy and social influence positively affected the attitude of Indians, whereas risk perception negatively affected attitudes. Facilitating conditions directly and significantly influenced effort expectancy and indirectly affected attitude. Both attitude and facilitating conditions were strong predictors of Indians'

behavioural intentions to use e-gov. Surprisingly, the researchers rejected the applicability of TAM constructs in the context of India.

Another study Sharma and Mishra (2017) also in the context of India investigated the role played by the intermediaries responsible for the delivery of e-gov services to countryside areas. They surveyed 328 Indian participants from 77 different countryside areas. Based on the PLS analysis they found that intermediaries' behaviour, their reliability, and their facilities significantly affect the quality of service. The latter in turn significantly and positively affected Indians' intentions to use e-gov. It was indicated that Indians' intentions to adopt e-gov was significantly affected by the ease where e-gov services would be obtained, via word of mouth and through the perception of usefulness.

In Malaysia, Lean *et al.* (2009) proposed a model based on the integration of (TAM), (DOI) and Trust and Risk model to detect factors which impact the adoption of e-gov. They surveyed 150 northern Malaysian employees and their conclusion was that the perception of privacy and non-repudiation perception are strong predictors of trust. The latter in turn directly and significantly affect Malaysians' intentions to adopt e-gov. Citizens perception in respect to authentication was found to have an insignificant effect on the degree of trust of the Malaysian sample. As they expected, the perception of usefulness positively influenced Malaysians' intentions to use e-gov, validating the applicability of TAM in that context. All factors of diffusion of innovation theory (complexity, relative advantages and image) directly and positively affected Malaysians' intentions. However, they found that uncertainty avoidance did not alter the direct relationships (of complexity, relative advantages and image) and Malaysians' intentions. They justified the unsupported moderation role of culture as the majority of the sample respondents were under 40 years old.

Despite the argument that perception of usefulness is similar to relative advantages according to Venkatesh *et al.* (2003a), the study of Lean *et al.* (2009) used both variables in their model. Both constructs were also used by Alomari, Woods and Sandhu (2012c). The

study of Lean *et al.* (2009), attributed the inclusion of both constructs to the work of Carter and Bélanger (2005a) but stated that the similarity between them is not obvious. Although Carter and Bélanger (2005a) included both variables, they did not find any significant effect on intention. Lean *et al.* (2009) added another justification of their inclusion of both variables based on the context of the study and the difference between USA as an advanced nation and Malaysia as a less advanced nation. They stated that, in the USA, citizens are usually familiar with online services and use them as part of everyday life and therefore, egov services could not be seen as a novelty, and for that reason the services provided did not exceed their expectations. Lean *et al.* (2009) concluded that both constructs significantly and positively affect individuals' intentions to use e-gov. Alomari, Woods and Sandhu (2012c) concurred, except for the factor of relative advantages, which was removed as it did not pass the load test.

A study in Gambia also produced a model based on TAM and ISSM to investigate Gambians' intentions to use e-gov by Lin, Fofanah and Liang (2011). They surveyed 146 Gambians and concluded that quality of information strongly affected Gambians' perception of ease of use, which in turn, affected their perception of usefulness and their attitudes. The latter also significantly affected Gambians' intention to adopt e-gov. Surprisingly, neither Gambians' intention to adopt e-gov nor their attitude was significantly affected by their perception of usefulness. The authors explained this finding as being caused by the lack of a well-developed ICT infrastructure that led Gambians to follow the conventional ways of interaction with government (face to face) as it is more reliable than Gambian Internet services provision. For the same reason, ICT infrastructure was found to be an important element of successful application and adoption of e-gov. However, Lin, Fofanah and Liang (2011) could have obtained a greater number of useful insights regarding Gambians reluctance to adopt of e-gov if they had employed a larger sample.

Another study in Ghana investigated the role played by age as a moderator of the causal effect of computer-self efficacy and Ghanaians' intentions to adopt e-gov, was

performed by Mensah and Mi (2019). The tested and validated model consists of three variables: self-efficacy, intention to use and age as a moderator. The data gathered from surveying 520 Ghanaians in Accra city revealed that age significantly moderated the link between computer self-efficacy and Ghanaians' intentions to adopt e-gov. The model was attempted to gain the comprehensive understanding of the issues that hinder Ghanaians' adoption of e-gov, with regard to the existing literature of e-gov. Another issue that needs to be considered is that the targeted sample was taken only in the capital, Accra, and thus the findings need to be treated with some caution.

To the best of our knowledge, less attention has been given in the studies of less advanced nations to different quality related constructs such as the ISSM model. Lin, Fofanah and Liang (2011) used two quality constructs, namely system and information. A study that investigated Singaporeans' adoption of e-gov used all constructs in an ISSM model with Trust as predictors of webpage quality. The statistical results of PLS analysis indicated that Singaporeans' trust toward government strongly affected their trust toward e-gov webpages, which in turn significantly affected all other quality constructs (systems, services and information). The findings also showed that the latter positively affected Singaporeans' continuous use of e-gov, whereas systems and services negatively affected their satisfaction. The authors then investigated the use of e-gov for both groups, namely passive end users, who request information, and active end-users, who transact with government, by conducting a split group analysis. Their findings indicated a strong relationship between the quality of information and passive Singaporean end-users, but not between passive Singaporeans enduser and the quality of the system. In contrast, active Singaporeans' trust toward technology strongly affected their trust toward e-gov webpages. All quality constructs exerted an insignificant influence on active Singaporean users' continuing use of e-gov webpages. Recently, Alsulaimani (2018) has argued that adopting the construct of trust without adding risk perception could lead to less realistic results. However, several other previous validated

studies did not incorporate risk perception with trust, for example, the studies of Carter and Belanger (2004a); Christian Schaupp and Carter (2005); Lean *et al.* (2009)

Another study integrated UTAUT and ISSM constructs to examine the adoption of e- service in Vietnam. It concerned with tax filing, and was conducted by Lu and Nguyen (2016). They surveyed 156 Vietnamese who used the service and found that Vietnamese's adoption was significantly influenced by all quality constructs (information, system and services). This study obtained different results from those of Teo, Srivastava and Jiang (2008) who concluded that the quality of information only affects Singaporeans' continuous usage of e-gov. Such contradiction could be justified through the reality that there is a welldeveloped ICT infrastructure in Singapore, enabling Singaporeans to be familiar with high quality systems and services.

Bhattacherjee (2001) developed a model known as the Information System Continuance Model. It was used by Jiang (2011) in a study of the intentions of Chinese users to make continuous use of an e-gov portal. The study's findings indicated that Chinese citizens' perception of usefulness and their satisfaction are significantly and positively influenced by the quality of information, the design and function, as well as reliability, whereas the security and privacy aspects positively affected only the perception of usefulness. The latter also positively and significantly affected the satisfaction and the continuous usage of the e-gov portal, whereas their satisfaction significantly and positively affected their continuous usage of the portal.

Most of the e-gov adoption studies cited previously focused primarily on students in their samples or targeted middle-aged and older participants. A study that targeted a sample of Chinese senior citizens, conducted by Phang *et al.* (2006) identified factors that affected their acceptance of IS, specifically electronic withdrawal, in an e-gov context. An analysis of the data indicated that Chinese senior citizens' intentions are significantly and positively influenced by their perceptions of ease of use, their perceptions of the usefulness of the Internet and their perceptions of safety. The authors also found that Chinese senior citizens' perceptions of usefulness are positively influenced by self-actualisation as well as resource saving. Also, their perception of usefulness was positively influenced by supported computer use, and their perception of ease of use was negatively influenced by anxiety in relation to computers.

Table 2.3, 2.4 and 2.5 below summarises the studies of e-gov conducted in KSA, other developing countries that share similar characteristics with KSA and other developing countries that do not share those characteristics with KSA.

Authors	Country	Name of the Journal	f Supported relationships		Negative/positive	Not supported relationships	
			From	То		From	То
(Al-Gahtani, 2003)	KSA	ITD	Relative advantages	Rate of adoption	positive		
			Compatibility	Rate of adoption	positive		
			Complexity	Rate of adoption	Negative		
			Trialability	Rate of adoption	Positive		
			Observability	Rate of adoption	Positive		
(Alshehri and Drew, 2010b)	KSA	IJACSA	Note: This study the adoption of o	v is designed to i e-gov.	dentify the usual barri	ers and constrai	ins that hinder
Hamner and Al-Qahtani (2009)	KSA	GIQ	Age and intention to accept	Intention to accept	Negative	Citizens' educational level	Intention to accept
			Citizens' knowledge of Internet	Intention to accept	Positive		
			Security	Intention to accept	Positive		
(Al-Solbi and Al- Harbi, 2008a)	KSA	Comm. Of the IBIMA					
Weerakkody et al. (2013)	KSA	IJIM	Expected performance	Citizens' behavioural intentions	Positive	Citizens' trust toward the Internet	Citizens' behavioural intentions
			Expected efforts	Citizens' behavioural intentions	Negative	Social Influence	Citizens' behavioural intentions
			Trust Toward Intermediaries	Citizens' behavioural intentions	Positive		
			Facilitating condition	Citizens' use behaviour	Positive		
Alateyah, Crowder	KSA	IJIMT	Service quality	E-readiness			
and Wills (2013)			Reliability Availability Speed of delivery	E-readiness E-readiness E-readiness	Note: model has not the relations are ba and expert opinions	been validated ased on citizen	so the list and is, employees

Table 2.3 Studies of e-gov in KSA

			Information	E-readiness			
			Compatibility	E-readiness			
			complexity	E-readiness			
			Image	E-readiness			
			Relative	E-readiness			
			Advantages				
			Gender	E-readiness			
			Education	E-reediness			
			Age	E-reediness			
			Culture	E-readiness			
			Lack 01	E-readiness			
			Technical	E-readiness			
			infrastructure				
			Usability	E-readiness			
			Accessibility Multi lingual	E-readiness			
			webpage	E-readilless			
			Information Security	E-readiness			
			Culture	E-readiness			
			E-readiness	Intention to			
				adopt			
			Intention to	Intention to			
			use Fase of use	adopt Intention to			
			Ease of use	use			
			usefulness	Intention to use			
			Transaction	Intention to			
			Information	Use Intention to			
			security	use			
			Perception of	Intention to			
			risk	use			
			Privacy	Intention to			
			Trust toward	Intention to			
			the Internet	use			
			the	intention to			
			government	use			
			Culture	Trust			
Alshehri, Drew and Alfarraj (2012)	KSA	IJACSA	Note: This study the adoption of e	y is designed to e-gov from citiz	identify usual barrie zens' and IT employed	ers and constrainers' perspective.	ns that hinder
(Al-Ghaith,	KSA	ЕЛSDC	Perception of	Intention to	Negative		
Sanzogni			complexity	adopt	-		
and Sandhu,			Privacy	Intention to	Positive		
2010)			Compatibility	adopt	Positivo		
			Companying	adopt	1 0511170		
			Internet	Intention to	Positive		
			Quality	adopt			
			Relative	Intention to	Positive		7
			Advantages	adopt	D :/:		
			Gender	adopt	Positive		
Alghamdi	KSA	Fed	Income	Adoption			
and Beloff		CSIS		E-services			
(2014)		2014	Gender	Adoption	Note: The model	in this student	has not have
			Percention or	E-services	validated	in uns study	
			Risk	E-services	. anduted.		
			Perception of	Adoption			
			security	E-services			
			Perception of	Adoption			
			privacy	E-services			
			guality	Adoption E-services			
			Users'	Adoption			
			Loyalty	E-services			

			Relative	Adoption			
			Advantages	E-services			
			Compationity	E-services			
			complexity	Adoption			
				E-services			
			Observability	Adoption			
			reliability	Adoption			
			lonwonny	E-services			
Choudrie,	KSA	HICSS	Trust toward	Perception	Negative	Trust	Citizens"
Alfalah and Spencer		2017	government	of risk		toward the	intentions
(2017)						government	Intentions
			Trust toward	Perception	Negative	Image	Perception
			the Internet	of risk			- £:.1.
							OI FISK
			Citizens'	Trust	Positive	Relative	Perception
			disposition to	toward the		advantages	
			trust	Internet			of risk
			Citizens'	Trust	Positive	Perception	Perception
			disposition to	toward the		of cyber	
			trust	government		risk	of risk
			Perception of	Citizens'	Negative	Primary	Perception
			risk	intention		Influence	
							ofrisk
			Trust toward	Citizens'	Positive		
			the Internet	intention			
			Complexity	Citizens'	Negative		
			Compatibility	Citizens'	Positive		
				intention			
			Perception of	Citizens'	Positive		
			support	Intention			
Alharbi,	KSA	BIT	Tangible	Perceived	Positive	Expected	Perceived
Papadaki			Security	security		efforts	·.
and Dowland			features				security
(2017)			Social	Citizens'	Positive	General	Citizens'
			influence	intention		Info.	
						Security	intention
			Facilitation	Citizens'	Positive	Awareness	
			conditions	intention			
			Habits	Citizens'	Positive		
			Expected	Citizens'	Positive		
			performance	intention	roshive		
			Trust	Citizens'	Positive		
			Derceived	intention	Positive		
			Privacy	uusi	1 OSITIVE		
			Perceived	trust	Positive		
			security	Danaa irra 1	Desitive		
			security law	security	Positive		
			Security	Perceived	Positive		
			culture	security			
			Interface	Perceived	Negative		
			quanty	security			

Table 2.4 Studies of e-gov in less advanced nations that share some significant characteristics with KSA

Authors	Country	Name of the Journal	Supported relati	onships	Negative/positive	Not relationships	supported
			From	То		From	То
Fakhoury and Aubert (2015)	Lebanon	IJIM	Active citizenship	Citizens' behavioural intentions	Positive		

			Trustworthiness	Citizens'	Positive		
				intention			
Alomari,	Jordan	ITPI	Perception of	Citizens'	Positive	Trust toward	Citizens'
Woods and Sandhu (2012a)			complexity	Citizens'	Positive	the Internet	intentions
(2012C)			Design of the	Citizens'	Positive		
			Beliefs	Citizens'	Negative		
			Trust toward government	Citizens' intention	Positive		
Al Khattab	Jordan	JSSM	Trust toward	Perceptions	Negative	Trust toward	Citizens'
<i>et ut.</i> (2015)			Trust toward	Perceptions	Negative	government	Intention
			Perception of	Perceptions	Positive		
			ease of use	of usefulness			
			Trust toward the Internet	Citizens' intention	Positive		
			Perception of risk	Citizens' intentions	Negative		
			Perceptions of ease of use	Citizens' intention	Positive		
			Perceptions of usefulness	Citizens' intentions	Positive		
Abu-Shanab (2015)	Jordan	GIQ	Empowerment	Citizens'	Positive		
(2010)				use webpage			
			Collaboration	Citizens'	Positive		
				use			
			Accountability	Citizens'	Positive		
				use			
			Accessibility of	webpages Citizens'	Positive		
			information	intention to use			
			Quality of	webpage	Dogitiyo		
			information	intention to	rositive		
				use webpage			
Al-Hujran <i>et al.</i> (2015)	Jordan	Computer Human	Power distance	Perception of ease of	Positive	Long-term orientation	Perception of ease of
		Behaviour	Uncertainty	Use Perception	Positive	Individualism	Use Perception
			avoidance	of ease of use		vs. Collectivism	of ease of use
			Power distance	Perception	Negative	Masculinity	Perception
			**	values	D	Femininity	use
			avoidance	of public	Positive	Long-term orientation	of public
			Citizens' trust	Values Perception	positive	Individualism	Values Perception
				of ease of use		vs. Collectivism	of public values
			Citizens' trust	Perception	Positive	Masculinity	Perception
			D	values		Femininity	values
			Perception of ease of use	Perception of public values	Positive	Perception of public values	Behaviour intention
			Attitude	Behaviour intention	Positive		
			Perceptions of	Citizens'	Positive		
			Perceptions of	Citizens'	positive		
			the public values	attitude			

Shafi and Weerakkody	Qatar	ECIS 2009	Expected performance	Citizens' intention		Gender	Citizens' intention
(2009)			Expected	Citizens'		Age	Citizens'
			efforts	intention			intention
			Social influence	Citizens'		Internet	Citizens'
				intention		experience	intention
Meftah,	Bahrain	ASS	Culture	Citizens'	Positive		
Gharleghi				intention			
and Samadi			Awareness	Citizens'	Positive		
(2015a)				intention			
			Trust	Citizens'	Positive		
				intention			

Table 2.5 Studies of e-gov in less advanced nations that different from Arabic countries and KSA.

Authors	Country	Name of the Journal	Supported relationships		Negative/positive	Non- support relationships	
			From	То		From	То
Rana and Dwivedi	India	GIQ	Expected outcomes	Affect	Positive		
(2015)			Social influence	Affect	Positive		
			Self-efficacy	Expected outcomes	Positive		
			Anxiety	Expected outcomes	Negative		
			Social influence	Citizens' behaviour intentions	Positive		
			Affect	Citizens' behavioural intentions	Positive		
			Self-efficacy	Citizens' behavioural intentions	Positive		
Sharma and Mishra	India	GIQ	Presence of physical facilities	Quality of services	Positive	Accessibility	Citizens' intentions
(2017)			Intermediaries' behaviour	Quality of services	Positive	Awareness	Citizens' intentions
			Ease of obtaining services	Citizens' intentions	Positive	Trust, beliefs	Citizens' intentions
			Positive Word of mouth	Citizens' intentions	Positive	Social influence	Citizens' intention
			Reliability	Quality of services	Positive	One-stop- shop	Citizens' intentions
			Quality of the services	Citizens' intentions	Positive		
			Usefulness	Citizens' intentions	Positive		
			Accessibility	Citizens' intentions	Positive		
			Note: Perception use and citizens'	of usefulness p intentions	plays a mediating role	between percept	ion of ease of
Lean <i>et al.</i> (2009)	Malaysia	IJIM	Image	Citizens' intentions	Positive	Citizens' Perception of authenticity	Citizens' trust
			Relative advantages	Citizens' intentions	Positive		
			Complexity	Citizens' intentions	Negative		
			Perception of usefulness	Citizens' intentions	Positive		
			Citizens' Trust	Citizens' intentions	Positive		
			Citizens' Perception of nonrepudiation	Citizens' trust	Positive		
			Citizens' Perception of privacy	Citizens' trust	Positive		
Lin, Fofanah	Gambia	GIQ	The quality of information	Perception of usefulness	Positive		

and Liang			Percentions of	Percentions	Positive		
(2011)			ease of use	of	1 0511140		
			Perceptions of	Citizens'	Positive		
			ease of use	attitudes			
			Citizens'	Citizens'	Positive		
			attitude	intentions			
(Mensah and Mi	Ghana	IJPA	Computer-self-	Citizens'	Positive	Age	Citizens'
2019)			Note: Age plays	a moderating ro	le between intention		Intentions
		D GG	and computer-se	lf-efficacy.			
Teo, Srivastava	Singapore	JMIS	Citizens'	Citizens'	All group categories	The quality	Citizens'
and Jiang			satisfaction	continuous	1 oshive	of services	continuous
(2008)			The quality of	Citizens'	Positive	The quality	Citizens'
			the services	satisfaction		of the information	satisfaction
			The quality of	Citizens'	Positive	Citizens'	Citizens'
			the system	satisfaction		trust toward technology	trust toward webpages
			The quality of	Citizens'	Positive		
			the information	continuous intention			
			Citizens' trust	The quality	Positive		
			toward webpages	of the services			
			Citizens' Trust	The quality	Positive		
			toward	of the			
			Citizens' trust	The quality	Positive		
			toward webpages	of the system			
			Citizens' trust	Citizens'	Positive		
			government	toward			
				webpage			
			TT1 1' C		Passive end-users		1
			the information	satisfaction	Positive		
			Information		Active end-users		
			Citizens' trust	Citizens'	Positive		
			toward	trust			
			teennology	webpage			
Lu and	Vietnam	Journal	The quality of	Citizens'	Positive		
Nguyen		of Modern	the system	intention to			
(2010)		Economy		use			
			The quality of	Citizens'	Positive		
			information	use			
			Social	Citizens'	Positive		
			influences	use			
			The expected	Citizens'	Positive		
			effort	intention to use			
			The expected	Citizens'	Positive		
			performance	intention to use			
Phang et	China	IEEE	Educational	Citizens'	Positive	Citizens'	Citizens'
al. (2006)			level	intention to use		Internet experiences	intention to use
			Perception of	Perception	Positive	Age	Citizens'
				usefulness			use
			Anxiety	Perceptions	Negative	Gender	Citizens'
			concerning computer use	of ease of use			to use
			Support for	Perceptions	Positive	Physiological	Perception
			computer use	of ease of		condition	of ease of
			1	LUSC	1	1	LUSE

			Resource saving	Perception of	Positive	Human contact	Perceptions of
			Self- actualisation	Perception of usefulness	Positive	preferences	userumess
			Perceived Internet safety	Citizens' intention to use	Positive		
			Perception of ease of use	Citizens' intention to use	Positive		
			Perception of usefulness	Citizens' intention to use	Positive		
Jiang (2011)	China	IEEE	Citizens' satisfaction	Citizens' continuous intentions		Perception of privacy and security	Citizens' satisfaction
			Perception of usefulness	Citizens' continuous intention			
			Perception of usefulness	Citizens' satisfaction			
			Perception of privacy and security	Perception of usefulness			
			Reliability	Perception of usefulness			
			Reliability	Citizens' satisfaction			
			Functionality & design	Perception of usefulness			
			Functionality & design	Citizens' satisfaction			
			The quality of the information	Perception of usefulness			
			The quality of the information	Citizens' satisfaction			

2.6.2 Studies of e-gov in Developed-Countries

Several studies have been conducted in advanced nations with the intention of understanding the adoption of e-gov from several perspectives. Carter and Belanger (2004b) presented a model based on the integration of TAM, DOI and Trust. They adopted the constructs of perceived usefulness and ease of use from the TAM model. In addition, they adopted three constructs from DOI theory, namely compatibility, image and relative advantages. They also added two constructs from trust: trust toward the Internet and trust toward government. They surveyed university students in the USA and concluded that perceived usefulness, relative advantages and compatibility significantly and positively affected the intention to use e-gov. In contrast, ease of use, image and trust toward government and the Internet had an insignificant effect on students' intention to adopt the system. They justified the unsupported relationship as students in the US are usually familiar with various online services. The participants were also familiar with Internet-related applications, such as using social media for communication with friends and family. Students used the Internet confidently, thus the insignificant effect of trust toward the Internet on their intentions. The authors also explained the insignificant effect of students' trust toward government was due to the fact the task under investigation was tax filling and so trust toward government was irrelevant.

Carter and Bélanger (2005a) repeated their previous study, also in the USA, with a targeted population of 105 citizens who were not students. Their findings differed from that of the earlier survey. Only citizens' perception of ease of use, compatibility as well as their trust toward the Internet and government exerted a strong impact on their intentions to use e-gov. Relative advantages and citizens' perception of usefulness, however, did not exert a significant effect on their intentions, which is contrary to the findings of the first study, although the findings with regard to compatibility were consistent in both studies. Despite the diversification of the targeted sample and the use of citizens instead of students, the study was limited in respect to the targeted sample, as it was small. Also, the study focused only on tax filing. A larger sample and a broader study of e-gov as a system could lead to a more comprehensive identification of the factors that most influence citizens' intention to adopt e-gov.

A study in the United Kingdom that investigated the catalytic factors which impact the adoption of e-gov was performed by Carter and Weerakkody (2008). However, the authors used the factors that already have been confirmed and validated in the context of the United States of America. They adopted four factors, namely relative advantages, Internet accessibility and related skills, and also the trust factor. They used a form of regression analysis known as Stepwise Binary Logistics to statistically analyse the participants, in a survey conducted in London. Two out of the four adopted constructs were found to have a strong impact on Londoners' intentions to adopt e-gov: relative advantages and trust. However, the possibility of generalising the findings of the study were limited by the authors' decision to survey participants from a single location. Greater diversification, with samples taken from a wider area in the United Kingdom would have resulted in more comprehensive findings, and these might have borne a greater similarity to studies conducted in the United States. The same could be said of other studies conducted in Great Britain by Gilbert, Balestrini and Littleboy (2004) and Kolsaker and Lee-Kelley (2008).

A comparative study of two countries, the U.S.A. and the UK, was conducted by Carter et al. (2016) for the purpose of exploring individuals' intention to use e-gov. They integrated constructs of two models, the TAM and the Trust and Risk model. They surveyed 140 and 105 participants respectively from two regions of the United States and the United Kingdom with a separate statistical analysis for each country. Their findings indicated that Americans' intention to adopt e-gov is significantly affected by their trust toward the Internet as well as toward government; their perception of ease of use; and their perception of usefulness. Furthermore, their trust toward the Internet and in government was significantly influenced by their disposition to trust, and their intentions to adopt e-gov was not significantly influenced through their perceptions of risk. They were also shown not to be significantly influenced by their trust toward government. The United Kingdome sample showed the same findings, except in the following three categories. The first of these is that the intentions of the British participants' to adopt e-gov was not strongly impacted by their trust toward government. The second is that the British participants intention to use e-gov was significantly influenced by their perception of risk. Finally, the British were not significantly influenced by their trust toward the Internet.

Carter *et al.* (2016) conducted a further analysis, by combining American and British participants in one sample. Their findings indicated that the intention to adopt e-gov was significantly affected by participants' perception of ease of use, their perception of usefulness, and their trust toward the Internet. Furthermore, participants' perception of usefulness was

impacted through their perceptions of ease of use and their disposition to trust was a significant predictor of their trust toward the Internet and toward the government. Participants' perception of risk was significantly influenced only by their trust toward the Internet, whereas their intentions to adopt e-gov as well as their perception of risk were shown to be insignificantly affected by their trust toward government. The participants' intentions to adopt e-gov was shown to be insignificantly affected by their perception of risk. The authors explained the unsupported link between UK users' trust toward the Internet as well as their perception of risk by the fact that UK participants are knowledgeable with regard to the existing services and the ways in which they could be used by them. In contrast, participants' intention to adopt e-gov was not significantly affected by their trust toward government. This finding applied to the United Kingdom participants and to the sum of both samples. However, in the United States sample, the authors found that participants were more likely to use different aspects in their evaluation. Participants were more likely to use e-gov webpage assessment aspects other than the aspects used to assess the government. Thus, despite citizens' satisfaction in respect of the delivery of e-gov services, they could be unhappy with government itself. The authors also explained the difference in the findings between the United States and the United Kingdome in respect to the link between individuals' perceptions of risk as well as their intentions to adopt e-gov. They concluded that the insignificance of the link between them in the United Statas is more likely to be due to Americans internal feeling of the difficulty of using e-gov there. The contributions of Carter et al. (2016) were valuable in terms of comparisons between those factors which impact individuals' adoption of e-gov between different context, but who share some characteristics, such as language and values. Also both the UK and the USA are advanced nations. Carter et al. also contributed to the understanding that what has been successfully applied in one context could be unsuccessful in another.

Gilbert, Balestrini and Littleboy (2004) also integrated TAM and DOI with qualityrelated aspect in the context of the United Kingdom. Their study focused on the identification of advantages gained from e-gov and the constraints that hinder its adoption in order to understand the factors that impact citizens' adoption of system-related services. Specifically, the authors investigated the reason for citizens' preference for the conventional approach to dealing with government rather than the electronic approach. They surveyed 111 participants from the city of Guildford and their findings indicated that UK citizens' attitude is influenced by reduction in time, reduction in cost, less interaction, their past experience, the quality of the information, financial security, stress reduction, trust and lastly visual appeal. Out of the all aforementioned factors, interaction reduction is showed to have an insignificant impact on citizens' willingness to adopt e-gov. Furthermore, citizens' use of e-gov is significantly predicted by time reduction, cost reduction, the quality of the information and the security of their financial transactions. The study identified trust as a prominent factor, and the outcomes of the research were in conformity with those of Carter and Weerakkody (2008). The statistical findings of the study also indicated that young UK citizens are more interested to adopting e-gov than older citizens.

Kolsaker and Lee-Kelley (2008) also carried out a study in the United Kingdom. Its framework was on the basis of the integration of a Technology Acceptance Model as well as other factors drawn from Coleman (2005). The study sought to understand the attitude of individuals to both e-gov and e-governance. The authors investigated seven factors, namely perceptions of ease of use, perceptions of usefulness, representation of the views of citizens, willingness to listen to citizens, closeness to citizens approachability and accessibility. They surveyed 302 participants and the result of their analysis indicated that individuals' intention to adopt e-gov is mostly influenced by the capability of the latter to satisfy their needs. The second strongest predictor of individuals' intention was the features of the system. Other significant predictors of the adoption of e-gov were the opportunity for dialogue, ease of information retrieval and the reliability of the system.

There have been other investigations of individuals' adoption of e-gov that have integrated more than one model, such as that of Warkentin *et al.*,(2002), which used an

integration of a theory of Planned Behaviour (TPB) and TAM to examine the role of trust toward encouraging citizens to adopt e-gov. The authors adopted perception of ease of use and usefulness from TAM as well as perceptions of behaviour control from TPB, and integrated two cultural dimensions, i.e., uncertainty avoidance and power distance based on a study by Hofstede (1991). They surveyed around 1000 taxpayers from different locations, including the United States, Latin America and Africa. Therefore, integrating cultural dimensions, particularly cross country studies, to investigate the influence of different culture could shed the light in new insights (Alsulaimani, 2018), but using a predefined scores of cultural dimensions in such a multi-culture countries might not fully explain the effect of culture.

In a similar vein, Horst, Kuttschreuter and Gutteling (2007) developed a model on the basis of the integration of TAM, TPB and the Trust Model to investigate the use of egov by Dutch citizens. The authors used a spilt-group analysis and SEM to analyse the targeted sample to discover whether a model using the proposed hypothesis could be validated for the two groups that were investigated. Their SEM analysis concluded that citizens' perception of usefulness generally exerted a positive impact upon their intentions to adopt e-gov. They also indicated such citizens' experience, subjective norms, their risk perception and perception of behavioural control are predictors of their perception of usefulness. The findings also showed such individuals' trust toward e-gov is influenced by individual trust toward government. The former also affected their perception of usefulness and their concerns with regards to e-gov. Furthermore, citizens' trust toward e-gov was influenced by both perception of behaviour control and perception of risk. The latter also is affected by citizens' experience. Finally, perception of usefulness of e-services in general influences individuals' perceptions of the usefulness of e-gov.

The attempts by Horst, Kuttschreuter and Gutteling (2007) to validate the model with regards to citizens of the Netherlands was limited by the size of the targeted sample. A further limitation was introduced when the targeted group were split into two sub-samples to

be analysed separately. Furthermore, the authors used citizens' perception of usefulness twice in the model with different items' measures for each e-serves in general and e-gov. They could have examined the different perception of each one in turn, but by doing so, they might have caused collinearity or confused the participants that took part in the survey.

Another comparative study by Seo and Bernsen (2016) examined the differences in attitudes between individuals who use or do not use e-gov and other citizens. They chose two different locations, one rural and one urban, both of them in the Netherlands. The proposed model was based on different constructs derived from different theories that investigated end-users' acceptance of e-gov. It combined nine constructs: perception of behavioural control, perception of usefulness, perceptions of ease of use, perception of risk, subjective norm, changing resistance, trust as well as distance between citizens' residences and the municipality. The data was gathered from a survey of 337 respondents and the analysis conducted on four categories namely, users and non-users, in Groningen and Emmen. In all four categories, citizens' intention to use e-gov was significantly and positively influenced by their perception of usefulness, which in turn was significantly and negatively influenced by distance in respect to municipalities. Furthermore, citizens' intention to use e-gov was significantly and positively affected by their perception of behavioural control, which was in turn is significantly and positively influenced by citizens' perception of knowledge that was considered as a necessity. Finally, citizens' perception of risk was negatively and significantly affected by trust.

Regards rural category, individuals' intentions to employ e-gov in general was negatively affected by the distance between their homes and the municipality. Whereas, both rural citizens' categories share the same relationship result. Individuals' intentions to use egov of them (rural as well as urban) categories of citizens who already use e-gov was significantly and positively affected by the perception of ease of use, but this was not the case for the category of citizens who do not use e-gov. The rural individuals who do not use e-gov were the only category in which perception of facilitating conditions is significantly affected by perception of behavioural control. Out of the four categories, there were three in which citizens' intention to use e-gov was significantly and negatively affected by their perception of risk, the exception being the category of urban citizens who do not use e-gov. One category, that of rural citizens who use e-gov, indicated that their intentions to employ e-gov was significantly and positively influenced by subjective norms. The authors summarised that, in general, the attitude of those in the rural category more frequently change in respect to e-gov than those in the urban categories. Overall, the authors confirmed the existence of differences between the two categories. In this study it is important to notice the differences in attitudes towards adoption of e-gov of citizens who belong to different areas of the same country, thus inferring the likelihood of differences between the citizens of two countries. Also, it should be noted that the results of the previous study showed the importance of sample size and its diversification. The sample needs to cover a wider area in order for the results to be more realistic and representative.

A study that also utilised an extension of the Theory of Planned Behaviour was conducted by Ozkan and Kanat (2011) in Turkey and was intended to aid the prediction of the intentions to use e-gov from individuals' viewpoint. They surveyed 392 students with regard to a loan provided to them by the government. Based on the findings, the authors concluded that Turkish's students intention to use e-gov was affected by their attitudes, their perception of behavioural control, their attitude and trust. The latter also directly and indirectly affected the Turkish students intention to use e-gov. Perception of usefulness was also directly affected by perception of ease of use. The findings also showed that each of the aforementioned factors was preceded by two predictors. The Turkish students' trust toward e-gov was predicted by their trust toward the government and in the Internet, while students' perception of ease of use and their perception of usefulness were also predictors of their attitude. Lastly, Turkish students' perception of behaviour control was predicted by their because it was restricted to students, it could not be said to represent the general use of e-gov in Turkey.

A recent study was conducted by Kurfali et al. (2017), also in Turkey, to identify factors which impact Turkish citizen' intentions to use e-gov. This study used an UTAUT model and added the factor of trust toward the Internet and trust toward government to increase the explanatory power of the model. It was based on a survey of 529 Turkish citizens, and it found that behavioural intentions were positively influenced by four factors, namely trust toward the Internet, social influences, expected performance and facilitating conditions. It was also concluded that Turkish citizens' trust toward the Internet and government significantly affected the expected performance. The citizens' behavioural intentions were not significantly influenced by the expected effort and their trust toward government. However, these findings contradict those of previous studies in the same context. In a study by Ozkan and Kanat (2011), citizens' perceptions of ease of use and their trust toward government significantly affected their intentions, whereas in the study by Kurfali et al., the expected efforts and citizens trust toward government do not affect intentions. This contradiction could be explained by the range of citizens that participated in both studies. Kurfali et al. surveyed senior citizens, whereas, Ozkan and Kanat (2011) surveyed students i.e. young citizens.

In Greece, Voutinioti (2013) proposed a model based on UTAUT to find determinants of citizens' use of e-gov. This author also sought to identify the role played by a Citizens Service Centre (CSC). A targeted sample of 224 citizens was surveyed and the findings indicated that the behavioural intentions of Greek citizens were positively and significantly influenced by expected performance, their trust toward the Internet and social influences. The conclusions of this study were in accordance with the study of Kurfalı *et al.* (2017), cited above, except that, in Voutinioti's study, citizens' trust toward e-gov with the expected efforts significantly influenced their behavioural intentions.

Interestingly, in a research performed by Weerakkody *et al.* (2013) in KSA also using UTAUT, citizens' trust toward the Internet and social influences had no significant effect on Saudi citizens' behavioural intentions. Such a contradiction could be justified by the cultural context and the different levels of e-gov achieved in each country. Voutinioti concluded that CSCS and social norms significantly affected Greek citizens' behavioural intentions and the existence of facilitating conditions significantly affected usage.

In the United States, a study performed by Welch, Hinnant and Moon (2005) examined the link between three constructs, namely individual' trust toward government, individuals' satisfaction with e-gov services and their Internet usage. The authors utilised official government statistics for their investigation and the measurements of the model were modified accordingly. The study indicated that citizens' satisfaction with e-gov webpages was positively linked to their usage of them. Citizens' trust toward the government were positively linked to the use of e-gov and citizens' satisfaction with e-gov webpages. It was obvious from the results that citizens' negative experiences in their use of e-gov webpages made them dissatisfied with e-gov as a whole. Consequently, citizens' trust toward the government itself was negatively influenced.

Another study in the United States that investigated the role played by citizens' trust and their perception of risk in their intention to use e-gov was conducted by Belanger and Carter (2008). The authors developed a model that included citizens' disposition to trust toward both government and the Internet, their perception of risk and finally their intention to use e-gov. They surveyed 214 participants and used AMOS for their statistical analysis. The finding of the study indicated that U.S. citizens' disposition to trust positively affected their trust toward the Internet and their trust toward government. The two latter factors in turn positively and directly affected U.S. citizens' intention to use e-gov. Moreover, the findings of the study also indicated that U.S. citizens' intention to use e-gov was influenced by their perception of risk. Interestingly, this contradicts what the author hypothesised. Previous studies of e-commerce had indicated no such links. According to Alsulaimani (2018), this contradiction is attributable to differences between e-gov and e-commerce in their nature and characteristics.

A study conducted by Shareef et al. (2011) proposed a model for e-gov which included the prime factors impacting Canadians' use of e-gov at several stages of e-gov service maturity. Eleven variables were included in a model which aimed to anticipate the adoption of e-gov in Canada. The authors included perception of awareness, perception of compatibility, computer self-efficacy, citizens' perception of ability, quality of information perception, citizens' perception of trust, availability of resources, multilingual options, citizens' perception of functional advantages, citizens' perception of image and citizens' perception of services response. They surveyed 239 Canadian citizens, all of whom had previously used e-gov systems. They also divided the adoption characteristics into two groups, namely static and interactive. Static adoption was connected with the adoption of egov during the initial implementation of e-gov webpages that offer information in response to enquiries, whereas, the interactive adoption was connected with the adoption of e-gov during the stage where the end user can interact and transact as well as enquire for information. The findings indicated that Canadian citizens' adoption of e-gov in the static stage was mostly influenced by citizens' perception of functional advantages, their perception of their ability to use the facility and their perception of awareness. In contrast, Canadian citizens' adoption of e-gov in the interactive stage was mostly influenced by their perception of their ability to use the facility, their perception of image, their perception of trust, and their perceptions of information quality and awareness. Interestingly, Canadians' perception of information quality negatively linked to their adoption in the interactive phase. The authors attributed the previous finding to the fact that Canadian citizens were confident in the belief that information is sufficiently updated and effectively fulfils their needs. The following Table 2.6 is a synopsis of the literature concerning the adoption of e-gov in advanced nations.

Authors	Country	Name of	Supported rela	tionships	Negative/positiv	Non	supported
		the			e	relationships	
		Journal	From	То		From	То
Carter and	US	IFFF	Compatibility	10 Citizens'	Positive	From Citizens'	10 Citizens'
Belanger	0.5.		Compationity	intention to	1 Ostrive	trust toward	intention to
(2004a)				use		the Internet	use
			Perception of	Citizens'	Positive	Citizens'	Citizens'
			usefulness	intention to		trust toward	intention to
			Dalation	use Citizens?		government	use
			advantages	intention to	positive	Image	intention to
			advantages	use			use
						Perception	Citizens'
						of ease of	intention to
	U.C.	101	D C			use	use
Carter and Rélanger	0.8.	155	trustworthines	intention to	positive	of	intention to
(2005a)			s	use		usefulness	use
			Perceptions of	Citizens'	Positive	Image	Citizens'
			ease of use	intention to			intention to
			G	use	D :::	D 1 (use
			Compatibility	Citizens'	Positive	Relative	Citizens'
				use		advantages	use
Carter and	U.S. & UK	ISJ	Citizens'	Citizens'	Positive	Accessibilit	Citizens'
Weerakkody			Trust	intention to		y to the	intention to
(2008)			D 1 4	use	D :::	Internet	use
			Relative	intention to	Positive	Internet	Citizens'
			advantages	use		skills	use
(Carter <i>et al.</i> ,	U.S. & UK	ISJ			United States		
2016)			Citizens' trust	Perception	Negative	Citizens'	Perception
			toward the	of risk		trust toward	of risk
			Internet	Citizana'	Desitive	government	Citizana'
			disposition to	trust toward	Positive	of risk	intention to
			trust	government		of fish	use
			Citizens'	Citizens'	Positive		
			disposition to	trust toward			
			trust	the Internet	Desitive		
			ease of use	of	rosuive		
				usefulness			
			Perception of	Citizens'	Positive		
			ease of use	intentions			
			Perception of	Citizens'	Positive		
			usefulness	intention to	1 oblive		
				use			
			Citizens' trust	Citizens'	Positive		
			toward	intentions			
			Citizens' trust	Citizens'	Positive		
			toward the	intentions			
			Internet	to use			
			D i C		United Kingdom		D
			Perception of	Citizens	Negative	Citizens'	Perception s of risk
			non	to use		government	5 OF HOR
			Citizens'	Citizens'	Positive	Citizens'	Perception
			disposition to	trust toward		trust toward	s of risk
			trust Citizens?	government	Positive	Citizens?	Citizeno'
			disposition to	trust toward	1 USILIVE	trust toward	intentions
			trust	the Internet		government	to use
			Perception of	Perceptions	Positive		
			ease of use	of			
			Parcentian of	Usefulness Citizone'	Positivo		
			ease of use	intentions	rositive		
			succ of use	to use			
			Perception of	Citizens'	Positive		
			usefulness	intentions			
				to use			

Table 2.6 Studies of e-gov conducted in advanced nations.

			Citizens' trust	Citizens'	positive		
			toward the	intentions			
			Internet	to use	Doth countries		
			Citizens' trust	Citizens'	Positive	Citizens'	Citizens'
			toward the	intentions	1 Ostrive	trust toward	intention to
			Internet	to use		government	use
			Citizens'	Citizens'	Positive	Citizens'	Perception
			disposition to	intentions		trust toward	s of risk
			Citizens'	Citizens'	Positive	Perception	Citizens'
			disposition to	intentions	1 Ostrive	of risk	intentions
			trust	to use			to use
			Perceptions of	Perceptions	Positive		
			ease of use	of			
			Perceptions of	Citizens'	Positive		
			ease of use	trust toward the Internet			
			Perception of usefulness	Citizens' trust toward	Positive		
			Citizens' trust	Perceptions	Negative		
			toward the Internet	of risk			
Gilbert, Balestrini and Littleboy	United Kingdom	IJPSM	Visual appeal	Citizens' willingness to use	Positive		
(2004)			Citizens' trust	Citizens' willingness to use	Positive		
			Low stress	Citizens' willingness to use	Positive		
			Financial security	Citizens' willingness	Positive		
			The quality of	to use	Dogitiyo		
			the	willingness	rositive		
			information	to use			
			Citizens' experience	Citizens' willingness to use	Positive		
			Cost saving	Citizens' willingness to use	Positive		
			Time Saving	Citizens' willingness to use	Positive		
(Kolsaker and Lee- Kelley, 2008)	United Kingdom	IJPSM	Ability to satisfy citizens' needs	Citizens' intention to adopt	Positive		
			Portal features	Citizens' intention to use	Positive		
			Dialogue with LCG	Citizens' intention to use	Positive		
			Ease of Info. Retrieval	Citizens' intention to use	Positive		
			Reliability	Citizens' intention to	Positive		
Warkentin <i>et</i>	United	Electronic	Perception of ea	se of use, usefu	lness, perception of h	ehaviour contro	l, uncertainty
al. (2002)	States, Latin America, Africa and others	Markets	avoidance and p Note: there is no	ower distance. o empirical valio	dation of the model		ý
Horst,	Netherland	Comp.			Two samples		
Kuttschreute	s	Hum.	Citizens' trust	Worries	Negative	Perception	Perception
r and Gutteling (2007)		Behaviour	toward e-gov	regarding e- gov		of behaviour control	of behaviour control

			Perception of risk	Citizens' trust toward e-gov	Negative	Perceptions of behaviour	individuals ' intentions to use (e-
			Citizens' trust	Perception	Positive	control Citizens'	gov) Perception
			toward e-gov	of usefulness (e-gov)		experience with e- services	s of behaviour control
			Citizens' experience with e-	Perception of usefulness	Positive	Citizens' experience with e-	Perception of usefulness
			services Perceptions of	(e-services) Individuals	Positive	services	(e-gov)
			ease of usage (e-services)	' intentions to adopt (e- services)			
			Perceptions of	Perception	One sample		
			usefulness (e- services)	of usefulness (e-services)	i osnive		
			Citizens'	Perception	positive		
			Perception of behaviour	Citizens' trust toward	Positive		
			control Perception of	e-gov Perception	Positive		
			behaviour control	of usefulness (e-services)			
			Perception of risk	Perception of usefulness	Negative		
			Subjective	(e-services) Perception	Positive		
			norms	of usefulness (e-services)			
C.,d	NT (1 1 1	CIO	(itizana who do	not employ of a gov	in rural areas	
Seo and	Netherland	GIQ			not employ of c-gov		<u></u>
Seo and Bernsen (2016)	S S	GIQ	Perception of risk	Citizens' intention to use e-gov	Positive	Subjective norms	Citizens' intention to use e-gov
Bernsen (2016)	Netherland S	GIQ	Perception of risk Perception regard facilitating condition	Citizens' intention to use e-gov Perception of behaviour control	Positive Positive	Subjective norms Perception of ease of use	Citizens' intention to use e-gov Citizens' intention to use e-gov
Bernsen (2016)	s	GIQ	Perception of risk Perception regard facilitating condition distance	Citizens' intention to use e-gov Perception of behaviour control Citizens' intention to use e-gov	Positive Positive Positive	Subjective norms Perception of ease of use	Citizens' intention to use e-gov Citizens' intention to use e-gov
Bernsen (2016)	s s	GIQ	Perception of risk Perception regard facilitating condition distance Perception of behaviour control	Citizens' intention to use e-gov Perception of behaviour control Citizens' intention to use e-gov Citizens' intention to use e-gov	Positive Positive Positive Positive	Subjective norms Perception of ease of use	Citizens' intention to use e-gov Citizens' intention to use e-gov
Seo and Bernsen (2016)	Netherland S	GIQ	Perception of risk Perception regard facilitating condition distance Perception of behaviour control Perception of necessary	Citizens' intention to use e-gov Perception of behaviour control Citizens' intention to use e-gov Citizens' intention to use e-gov Perception of	Positive Positive Positive Positive Positive	Subjective norms Perception of ease of use	Citizens' intention to use e-gov Citizens' intention to use e-gov
Bernsen (2016)	Netherland S	GIQ	Perception of risk Perception regard facilitating condition distance Perception of behaviour control Perception of necessary knowledge	Citizens' intention to use e-gov Perception of behaviour control Citizens' intention to use e-gov Citizens' intention to use e-gov Perception of behaviour control	Positive Positive Positive Positive Positive Positive	Subjective norms Perception of ease of use	Citizens' intention to use e-gov Citizens' intention to use e-gov
Seo and Bernsen (2016)	Netherland S	GIQ	Perception of risk Perception regard facilitating condition distance Perception of behaviour control Perception of necessary knowledge	Citizens' intention to use e-gov Perception of behaviour control Citizens' intention to use e-gov Citizens' intention to use e-gov Perception of behaviour control Perception of risk	Positive Positive Positive Positive Negative Positive	Perception of ease of use	Citizens' intention to use e-gov Citizens' intention to use e-gov
Seo and Bernsen (2016)	Netherland S	GIQ	Perception of risk Perception regard facilitating condition distance Perception of behaviour control Perception of necessary knowledge Citizens' trust Perception of ease of use	Citizens' intention to use e-gov Perception of behaviour control Citizens' intention to use e-gov Citizens' intention to use e-gov Perception of behaviour control Perception of risk Perception of behaviour control	Positive Positive Positive Positive Positive Positive Positive Positive Positive	Subjective norms Perception of ease of use	Citizens' intention to use e-gov Citizens' intention to use e-gov
Bernsen (2016)	Netherland S	GIQ	Perception of risk Perception regard facilitating condition distance Perception of behaviour control Perception of necessary knowledge Citizens' trust Perception of ease of use Perception of ease of use	Citizens' intention to use e-gov Perception of behaviour control Citizens' intention to use e-gov Citizens' intention to use e-gov Perception of behaviour control Perception of sehaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control	Positive	Subjective norms Perception of ease of use	Citizens' intention to use e-gov Citizens' intention to use e-gov
Seo and Bernsen (2016)	Netherland S	GIQ	Perception of risk Perception regard facilitating condition distance Perception of behaviour control Perception of necessary knowledge Citizens' trust Perception of ease of use of use of use distance	Citizens' intention to use e-gov Perception of behaviour control Citizens' intention to use e-gov Citizens' intention to use e-gov Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control	Positive Positive Positive Positive Positive Positive Positive Negative Positive Nositive Nos	Subjective norms Perception of ease of use	Citizens' intention to use e-gov Citizens' intention to use e-gov
Seo and Bernsen (2016)	Netherland S	GIQ	Perception of risk Perception regard facilitating condition distance Perception of behaviour control Perception of necessary knowledge Citizens' trust Perception of ease of use of ease of use distance	Citizens' intention to use e-gov Perception of behaviour control Citizens' intention to use e-gov Citizens' intention to use e-gov Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of behaviour control Perception of control Perception con control Perception con control Perception con control Perception con control Perception con control Perception con control Perception con control Perception con control Perception con control Perception con control Perception con control Perception con control Perception con control Perception con control Perception con control Perception con control Perception control Control Perception control Control Perception control Contro	Positive Positive Positive Positive Positive Positive Positive Negative Positive Nogative Nog	In full areas Subjective norms Perception of ease of use	Citizens' intention to use e-gov Citizens' intention to use e-gov
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	Perception of	Citizens'	Positive	Perception	Citizens'
	behaviour	intention to	1 Ositive	of ease of	intention to
	control	use e-gov		use	use e-gov
	Perception of	Perception	Positive	distance	Citizens'
	necessary	of	1 Oblive	distance	intention to
	knowledge	behaviour			use e-gov
		control			
	Citizens' trust	Perception	Negative		
		of risk			
	Perception of	Perception	Positive		
	ease of use	of			
		behaviour			
		control			
	Perception of	Perception	Positive		
	ease of use	of			
		usefulness			
	distance	Perception	Negative		
		of			
		usefulness	D '4'		
	Perceptions of	intentione	Positive		
	userumess	to adopt a			
		to adopt e-			
		Citizens w	b_{0} use of e-gov in ru	ral areas	
	Subjective	Citizens'	Positive	Perception	Perception
	norms	intention to	1 Oblive	regarding	of
		use e-gov		facilitating	behaviour
				conditions	control
	Perception of	Citizens'	Negative		
	risk	intention to			
		use e-gov			
	Perception of	Citizens'	Positive		
	ease of use	intention to			
		use e-gov			
	Distance	Citizens'	Negative		
		intention to			
	Demonstion of	Use e-gov	Desitive		
	heheviour	intention to	Positive		
	control				
	Perception of	Perception	Positive		
	necessary	of	1 OSITIVE		
	knowledge	behaviour			
	into intelige	control			
	Citizens' trust	Perception	Negative		
		of risk			
	Perception of	Perception	Positive		
	ease of use	of			
		behaviour			
		control			
	Perception of	Perception	Positive		
	ease of use	of			
	Dit	usefulness	N:		
	Distance	of	negative		
		usefulness			
	Perception of	Citizens'	Positive		
	usefulness	intention to			
	aseraniess	use e-gov			
		Citizens wł	o use of e-gov in urt	oan areas	
	Perception of	Citizens'	Positive	Subjective	Citizens'
	ease of use	intentions		norms	intention to
		to use e-gov			use e-gov
	Perception of	Citizens'	Positive	Perception	Citizens'
	behaviour	intentions		of risk	intention to
	control	to use e-gov			use e-gov
	Perception of	Perception	Positive	Perception	Perception
	necessary	ot		regard	ot
	knowledge	benaviour		Iacilitating	benaviour
	Citizana' truct	Dercention	Negative	Distance	Citizene'
	Citizens trust	of risk	Negative	Distance	intention to
		OTTISK			use e-gov
	Perceptions of	Perceptions	Positive		
	ease of use	of			
		behaviour			
		control			

			Perceptions of	Perceptions	Positive		
			ease of use	of usefulness			
			Distance	Perceptions of	Negative		
				usefulness			
			Perception of usefulness	Citizens' intention to use e-gov	Positive		
Ozkan and Kanat (2011)	Turkey	GIQ	Perception of ease of use	Perception of usefulness	Positive		
			Beliefs	Perception	Positive		
				of behaviour control			
			Perception of	Perception	Positive		
			ease of use	of behaviour control			
			Perception of ease of use	Citizens' attitude	Negative		
			Perception of usefulness	Citizens' attitude	Positive		
			Citizens' trust toward government	Citizens' trust	Positive		
			Citizens' trust toward the Internet	Citizens' trust	Positive		
			Citizens' trust	Citizens' attitude	positive		
			Citizens' attitude	Citizens' intention to use e-gov	positive		
			Citizens' trust	Citizens' intention to use e-gov	Positive		
			Perception of behaviour control	Citizens' intentions to use e-gov	Positive		
Kurfah <i>et al.</i> (2017)	Turkey	Comp. Hum. Behaviour	Citizens' trust toward government	Expected performanc e	Positive	Expected performanc e	Citizens' behavioura l intention
			Citizens' trust toward the Internet	Expected performanc e	Positive	Citizens' trust toward government	Citizens' behavioura 1 intention
			Citizens' trust toward the Internet	Citizens' behavioural intention	Positive		
			Facilitating conditions	Citizens' behavioural intention	Positive		
			Social influence	Citizens' behavioural intention	Positive		
			Expected performance	Citizens' behavioural intention	Positive		
Voutinioti (2013)	Greece	Procedia Technolog y	Citizens' trust toward CSCS	Citizens' behavioural intention	Positive		
			Citizens' trust toward government	Citizens' behavioural intention	Positive		
			Citizens' trust toward the Internet	Citizens' behavioural intentions	Positive		
			Social influences	Citizens' behavioural intention	Positive		
			Expected efforts	Citizens' behavioural intentions	Positive		
			Expected performance	Citizens' behavioural intention	Positive		

			Facilitating	citizens'	Positive		
			conditions	usage			
				behaviour	D it		
			Citizens'	citizens	Positive		
			intention	behaviour			
Welch,	U.S.	JPART	Citizens'	Citizens'	Positive		
Hinnant and			Satisfaction	trust toward			
Moon (2005)			with the	government			
			webpage				
			Citizens'	Citizens'	Positive		
			Satisfaction	trust toward			
			Citizens'	Citizens'	Positive		
			webpage	Satisfaction	robute		
			usage	with the			
				webpage			
			Citizens'	Citizens'	Positive		
			webpage	satisfaction			
Polongor and	US		Usage	With e-gov	nagativa	Doroontion	Citizons'
Carter (2008)	0.3.	3313	toward	of risk	liegative	of risk	intentions
Curter (2000)			government	ornon			to use
			Citizens' trust	Citizens'	Positive	Citizens'	Perception
			toward the	intentions		trust toward	of risk
			Internet	to use	D ::	the Internet	
			toward	intentions	Positive		
			government	to use			
			Citizens'	Citizens'	Positive		
			disposition to	trust toward			
			trust	the Internet			
			Citizens'	Citizens'	Positive		
			trust	government			
Shareef <i>et al.</i>	Canada	GIQ	uust		Interactive stage		
(2011)		``					
			Perception of	Citizens' e-	Negative		
			info. quality	gov			
			Perception of	Citizens' e-	Positive		
			trust	gov	1 Ostrive		
				adoption			
			Image	Citizens' e-	Positive		
			perception	gov			
			Ability to use	Citizens' e	Positive		
			perception	gov	1 0510100		
			1 1	adoption			
			Awareness	Citizens' e-	Positive		
			perception	gov			
				adoption	Static stage		
			Functionality	Citizens' e-	Positive		
			benefits	gov			
			perception	adoption			
			Ability to use	Citizens' e-	Positive		
			perception	gov			
			Awareness	Citizens' e-	Positive		
			perception	gov	1 OSITIVO		
			1 1	adoption			

2.7 Evaluating Existing e-gov Literature

There are many studies that conducted to investigate the adoption of e-gov from several perspective in diverse contexts. However, the previous discussion of e-gov

adoption studies has shed the light in some important issues that need to be considered in the future researches. These issue are summarised in the following:

- 1. The existing literature includes only a limited number of studies that investigate the adoption of e-gov in KSA.
- 2. The few studies that have been conducted in KSA are limited by their concentration on particular types of services within e-gov systems, on specific groups, based on gender or on the collection data from a single location, as in the work of Choudrie, Alfalah and Spencer (2017) and Weerakkody *et al.* (2013). However, e-gov in KSA covers a wide area of the country and provides services for different beneficiaries. One of the categories of beneficiaries is the female population. There has recently a greater focus on women's activities. For example, the '2030 Vision' scheme allows women to drive motor vehicles. Gender segregation, religious based issues, the tribal system and a tendency towards restricted contact between males and females could affect e-gov adoption by females. Therefore, diversifying the targeted sample and collecting data from a wider area could bring more realistic and reliable results.
- 3. Another issue is that some studies that have investigated an e-gov systems that was actually not working and not published at the time of completion and the surveys were based on perceptions of future use of it e.g. Hamner and Al-Qahtani (2009). Moreover, only a few factors that could impact the adoption of e-gov were considered and the targeted sample was selected from a single location. Many factors that affect the adoption of e-gov, especially technical aspects, require participants who make practical use of the system if investigators are to gain more meaningful results.

- 4. Several studies conducted in KSA were not accompanied by an empirical validation of the models used, e.g., Alshehri, Drew and Alfarraj (2012) and Alateyah, Crowder and Wills (2013).
- 5. Based on the existing literature and to the researcher's best knowledge, the majority of the e-gov adoption researches have emphasised on the direct influence of the studied variables on intention to use. There are, however, many contradictory and inconsistent results in the literature e.g. (Alomari, 2014; Alsaif, 2014; Carter *et al.*, 2016; Choudrie, Alfalah and Spencer, 2017; Venkatesh *et al.*, 2003a). Therefore, indirect and internal relationships between those factors need to be further investigated if these contradictions are to be understood.
- 6. There have been calls to diversify the methodological and analytical approach in an attempt to uncover the complex relationship between the variables that lead to the adoption of technology (Bagozzi, 2007; Pappas, Giannakos and Sampson, 2017; Pappas *et al.*, 2017). Most of the studies in the literature have employed either the Co-variance based technique (CB-SEM) or Partial Least Square (PLS-SEM). However, both technique presuppose a symmetrical relation between the variables studied (O'Donohue, 2016; Woodside, 2014; Woodside, 2017), and for that reason, more investigation need to be done.
- 7. Most of the studies that studied culture employed Hofstede measures, which are designed to be conducted on a national level to investigate individuals. Some of them used pre-defined scores for each country to study the effect of culture. However, the former approach was unworkable using Hofstede measures and other studies had warned against such an application. The latter approach could create a situation whereby a particular context consisted of a heterogeneous population with multi-cultural factors. Therefore, investigators in future should

use a scale that is validated on an individual level to see the cultural orientation of citizens.

8. Several studies in developed countries indicate that the reluctance of using e-gov could be the result of the a low level of trust in government and technology. Despite that, few studies have examined the influence of trust in government and technology in the context of KSA e.g. Weerakkody *et al.* (2013), and some of these studies have not empirically validated their findings e.g. Alateyah, Crowder and Wills (2013). Other studies have focused on a particular area, service or group of people e.g. Choudrie, Alfalah and Spencer (2017) and Alharbi, Papadaki and Dowland (2017). KSA is a large country that is equivalent in size to the sum of Italy, Spain, Sweden, United Kingdom, France and Portugal. Many tribes, which speak, eat and live differently, are located in different areas of KSA. Attitudes that are acceptable in one area or tribe could be unacceptable in the others. Even words that are acceptable in one area are not in other. Some cities are westernized such as Jeddah, Riyadh and Dammam while others preserve a conservative culture.

Several studies proved that trust in government and technology can be different between countries that share similar characteristic e.g. Carter et al. (2016). Even the influence of trust in government and trust in technology can be different between groups who live in the same countries e.g. Carter and Belanger (2004b) and Carter and Bélanger (2005a). This is particularly important as e-gov in KSA is still considered as a new system and the conventional way (face to face) is still working in parallel with it. This in turn is more likely to make individuals evaluate both approaches. Therefore, trust in government and trust in technology need to be empirically investigated with a representative sample that could reflect and produce more meaningful findings.

- 9. Several studies conducted in different countries have investigated the catalytic factors that affect the adoption of e-gov, but their direct application to KSA is restricted by the following issues:
 - a. Restricted ability to generalize the findings of those studies due to the limited size of the targeted population e.g. Lin, Fofanah and Liang (2011) and Horst, Kuttschreuter and Gutteling (2007).
 - b. Each country has its own context in respect to several issues, such as the level technological advancement and infrastructure, economic issues, traditions etc. Many of the studies conducted in developed or less advanced nations are based on the level of technological advancement achieved by those countries e.g. Dwivedi *et al.* (2017), Voutinioti (2013), Seo and Bernsen (2016) and Sharma and Mishra (2017). Carter *et al.* (2016), who was discussed previously, demonstrated that differences in the adoption of e-gov and the factors affecting it, are not only apparent in studies conducted in different countries but are also apparent in studies that focus on citizens who live in different areas of the same country. More interesting is that some of the studies validating an identical model in the same country produced different results due to one sample being conducted with students and another with ordinary citizens e.g. Carter and Bélanger (2005a) and (Carter and Belanger, 2004a). KSA has its own social context, and needs to be investigated accordingly.
 - c. Several studies are limited with regard to their size and the characteristics of the targeted groups, and this could raise issues regarding representativeness. Some of these studies targeted students e.g. Carter and Belanger (2005) and Teo, Srivastava and Jiang (2008).

d. Despite the similarities between some of the countries of the adoption studies e.g. (language and ICT advancement, maturity level etc.), it is obvious from the existing literature that each country presents a different context, and this needs to be taken into consideration.

2.8 Global Assessment of e-gov

Since 2001, there has been a rapid growth in the adoption and application of egov globally. As reported by United-Nations (2018) e-gov survey statistics, the global development of e-gov has increased to the highest level ever recorded. The e-gov development index of 40 countries has recorded values from 0.75 to 1.00 in comparison to 2013 (10 countries) and 2016 (29 countries). However, there is a major gap in the adoption of e-gov between end-users in advanced nations and those in unadvanced nations. Participation in e-gov from advanced nations, like Denmark, France, Japan and New Zealand, is in excess of 90%, whereas, participation in e-gov in less advanced nations, such as Turkmenistan, Libya, the Democratic Republic of the Congo, the Democratic People's Republic of Korea and Sudan is less than 15%.

The United Nations has acknowledged the difficulty of gathering precise data concerning the adoption of e-gov in less advanced nations, but the available data indicates a low degree of involvements in e-gov in those nations. The reasons for such low e-gov use in those countries can be attributed to low level of electronic government services, lack of online service components and poor telecommunication infrastructures (UNDESA, 2017). Consequently, end-users in those countries are not motivated to adopt e-gov as their needs are not met and not delivered according to their expectations. This leads to a reluctance to use e-gov and a continuing preference for conventional (face to face) interactions and enquiries when dealing with government functions.

Significant roles are played in the level of adoption of e-gov by both the level of maturity of e-gov services as well as end-users admittance of the facilities. Based on these two elements, electronic government for each country could be classified according to four main groups. These are: "(High-Maturity)" and "(High-Acceptance)"; "(High-Maturity)" and (Low-Acceptance)"; "(Low-Maturity)" and "(High-Acceptance)"; and "(Low-Maturity)" and "(Low-Acceptance)". Despite the high level of maturity of services in a few third world nations, the rates of acceptance e-gov are low (United-Nations, 2018). According to United-Nations (2018), KSA is one such country, and is an appropriate case for an investigation of the low rate of adoption.

2.9 Conclusion

This chapter has reviewed the introduction and development of e-gov since its inception. It also explained the pressure on government and public sectors to utilise information technology and its application in their departments. Various definitions of e-gov from different prospective have been offered, and there is no consensus among researchers as to the definition of the concept. Also, e-gov categories have been presented. Motives for the introduction of e-gov were presented, and the obstacles that need to be confronted were explained. The chapter also discussed in detail previous studies of e-gov adoption by defining two categories, namely advanced nations and less advanced nations. All of these categories of e-gov studies were then evaluated to identify issues that need to be further investigated. The chapter ends with a global assessment of e-gov. The following chapter will present the conceptual framework and the proposed hypothesis of this research.
CHAPTER THREE

THEORATICAL RESEARCH

3.1 Introduction:

The prior chapter reviewed literature review and stated the primary aim of the study, which is to understand the existing state of e-gov in general, and that of KSA in particular. A critical analysis of the issues in the literature was presented, and gaps identified for the purpose of further investigation.

In the current chapter, the second aim of the research will be fulfilled, which is to propose "in terms of the existing literature, a conceptual model that includes the catalytic factors that impact the adoption of e-gov with reference to the viewpoints of citizens". The research will then proceed to the next aim.

There will be discussion of the theoretical background of adoption of technology as well as of the adoption of e-gov from a citizens' prospective. The discussion will investigate previous studies in the field and the key factors impacting the adoption of egov are highlighted. Moreover, the effect of social influences and culture will be investigated so as to predict citizens' intention to adopt e-gov in a less advanced nations like KSA, where traditions, faith and religion play a significant role in people's lives. A conceptual model is introduced, and a configurational view is presented to justify the need for investigation. The complex interactions of the factors will be investigated as an alternative than studying the influence of each factor in isolation. A synopsis will be given at the end of the chapter to review the areas that have been covered.

3.2 Theories and Models of E-gov Adoption

Studies on e-gov adoption refer to various theories and models adopted from diverse disciplines, such as information systems, psychology, sociology, management studies, political studies, communication and technological aspects to help in creating a conceptual framework that will underpin the researcher's argument. The widely recognised theories and models utilised in these studies include the ""Theory of Reasoned Action" (TRA)", the "Theory of Planned Behaviour (TPB)", the "Motivational Model (MM)", the "Model of PC Utilisation (MPCU)", "Social Cognitive Theory (SCT)", the "Diffusion of Innovation Theory (DOI)", the "Unified Theory of Acceptance and Use of Technology (UTAUT)", the "Technology Acceptance Model (TAM)" and the "Model of Trust and Risk (MTR)". Not one of these models, however, includes all the catalytic variables, particularly cultural and social aspects. This is because researchers adopt specific models and theories to fit their argument, which leads to the neglect of important variables in other models and theories (Venkatesh et al., 2003b). However, these theories and model will be discussed briefly in next section, followed by a discussion of the theories that have been particularly used and integrated in the current study to investigate e-gov in KSA. This will present a clear justification of the selection of chosen theories.

From a social psychology perspective, Fishbein and Ajzen (1975) presented a "Theory of Reasoned Action" (TRA). It posits that behaviour is affected by intention, which is in turn a function of information or beliefs that a certain action will lead to specific results (see Figure 3.1) (Belanger and Carter, 2008). They divided the beliefs that affect the behavioural intention into personal attitude and subjective norm. Personal attitude alludes to a negative or positive feeling toward the performance of a particular form of such behaviour. 'Subjective norm' refer to the individual's perception of other individuals' positive or negative feelings towards the performance or avoidance of a certain form of behaviour (Madden, Ellen and Ajzen, 1992). This theory assumes that individuals rationally use their beliefs or the information they possess in order to evaluate motivational factors and implications and to predict the outcome of performing a

particular kind of behaviour. Thus, the theory proposes that an increase in an individual's intention to use or accept a system depends on prior awareness and beliefs regarding that system and its benefits. It is considered as among the earliest persuasive theories to evaluate individuals' behaviour. particularly in terms of the individual's acceptance of technology (Lean *et al.*, 2009).



Figure 3.4: "Theory of Reasoned Action" (Fishbein and Ajzen, 1975)

Despite the ability of this theory to predict human behaviour, it has been criticised on the grounds that predicting individuals are attributed with too little control over their own actions (Sharma and Kanekar, 2007). The theory ignores the individual's ability to perform specific behaviour and instead considers the motivational factors leading to the performance of this behaviour (Alsaif, 2014).

To overcome such limitations, Ajzen (1991) proposed a Theory of Planned Behaviour (TPB) which is an extension of the "Theory of Reasoned Action" (TRA). He added one set called "Perceived Behavioural Control" which indicates the someone's perceptions of the ease or difficulty of conducting a specific behaviour (Lean *et al.*, 2009). "Perceived Behavioural Control" is affected by two constructs namely, "Self-Efficacy" and "Facilitating Conditions" (see Figure 3.2). According to Bandura (1982), "Self-Efficacy" refers to an individual's belief that he/she is able to perform a particular behaviour to gain a particular outcome, whereas "Facilitating Conditions" refers to the resources required to perform that behaviour. Thus, the individual's intention to perform a particular form of behaviour is positively impacted by individual attitude, subjective norms and perception of behavioural control. This addition gives a predictive power to the theory, especially to e-gov adoption, as it includes the knowledge and tools to facilitate the user's electronic transactions with government (Lean *et al.*, 2009).



Figure 3.5: Theory of Planned Behaviour (Ajzen, 1991)

However, ignoring important variables such as personal, demographic as well as a lack of measurements of "Perceived Behavioural Control" are considered weaknesses of both TRA and TPB. Also, for TPB to work, the control over behaviour is voluntary. Moreover, the is no reflection of unconscious motives in the theory (Alsaif, 2014).

For a motivational model to remedy such limitations, Ryan and Deci (2000) explained that all facets of activation and intention such as energy, direction, persistence, and equifinality are closely linked to motivation. According to Deci (2012) motivation can be categorised as two separate sets, the intrinsic and the extrinsic. Intrinsic motivation refers to performing a particular activity without an influence of external rewards, for reasons such as enjoyment, satisfaction, exploration and purposeful learning (Coon and Mitterer, 2012). Thus, intrinsic motivation is positively affected by enjoyment of a system usage irrespective of the performance result of usage (Venkatesh, 2000). Extrinsic motivation is described by Brown (2007) as individual intention to perform particular behaviour as a result of an external tangible or intangible rewards or benefits,

such as monetary incentives or desire for praise. According to Davis, Bagozzi and Warshaw (1992), extrinsic and intrinsic motivations have significant effect on an individual's employment of information systems, due to the latter's perceived usefulness, and the enjoyment to be derived from successful adoption and use, whereas the focus of previous theories and models had been on the intention to use.

Thompson, Higgins and Howell (1991) have applied a "Model of PC Utilisation" (MPCU) which mainly focuses on individual personal behaviour in the prediction of computer usage. This model is derived from a theory of human behaviour proposed by Triandis (1977). The model includes six elements, as follows:

- Job fit: The extent to which it is believed that job performance will be improved by using such technology.
- Long term consequences: The future gain from using such a technology or system.
- Complexity: The individual's perception of the degree of difficulty of the use of such technology
- Social factors: Relation to culture, subjective norms and interpersonal factors.
- Affect toward use: Relates to feelings that result from using such technology such as happiness, pleasure or displeasure, etc.
- Facilitating conditions: The support provided to individuals to facilitate the use of the technology or system.

This model has been applied by Thompson, Higgins and Howell (1991) as an attempt to understand and predict individual personal acceptance and behaviour with regard to IT.

Other researchers have applied one of the well-established theories of human social behaviour, known as the "Social Cognitive Theory" (SCT). This theory, presented by Bandura (1986) emphasises that individuals learn from observation in a particular social context (see Figure 3.3). It is used to explain the influence of individual personal beliefs on a particular behaviour and in addition, the relationship between those beliefs (Bandura, 2001). Also, the theory explains that the adoption of technologies is affected by an individual's perception of his/her capability to use such technology, "self-efficiency", and also factors that trigger anxiety over technology. According to Compeau and Higgins (1995), outcome expectations are linked to personal factors and performance, which are in turn linked to behaviour.



Another inclusive model, presented by Venkatesh *et al.* (2003b), is called Unified Theory of Acceptance and Use of Technology (UTAUT). This model aims to comprehend both individual intentions to use and future usage behaviour. It is based on eight models that some of which have been cited previously. These models are the "Theory of Reasoned Action" (TRA), the "Technology Acceptance Model l(TAM)", the "Motivational Model (MM)", the "Theory of Planned Behaviour(TPB)" and an integration of (TAM) and (TPB), the "Model of Personal Computer Use (MPCU)", the "Diffusion of Innovations theory (DOI)", and the "Social Cognitive Theory(SCT)". Consequently, the model has a significant predictive power to explain the intention to use technology and the subsequent usage (Weerakkody *et al.*, 2013).

Based on Venkatesh *et al.* (2003b), the model suggests that individuals' actual use is directly influenced by both "facilitating conditions" and "behavioural intention"

and the latter is in turn affected by expected performance", "expected efforts" and "social influence". There are also four variables that moderate the relationship between both "behaviour intention" and "actual use" and other independent variables. These moderating variables include gender, age, experience and the voluntariness of use (Venkatesh *et al.*, 2003b) (see Figure 3.4). Venkatesh *et al.* (2003b) described the determinant variables as follows:

- Performance expectancy: refers to the extent to which a person believes that employing a certain technology or system would improve the required job performance.
- Effort expectancy: described as someone's belief that the employment of a technological advancement or system would be easy.
- Social influence: someone's perceptions of others' beliefs about the use of a specific technology or system.
- Facilitating conditions: individual beliefs concerning the support offered in the usage of a specific technology or system.
- Behavioural intention: The probability of an individual performing the behaviour under investigation.



Figure 3.7: "Unified Theory of Acceptance and Use of Technology" (Venkatesh et al., 2003a)

According to Benbasat and Barki (2007), the addition of social norms and perceived behaviour control to the UTAUT model overcomes the limitations of TAM as a basic model. Despite the greater ability of the model to explain users' intentions and behaviour, it has been criticised in many studies, as it ignores the individual beliefs and attitudes regarding the use of a particular technology or system (Al-Gahtani, Hubona and Wang, 2007b; Bagozzi, 2007; Paola Torres Maldonado *et al.*, 2011).

TAM model is commonly applied in studies that seek to illustrate the willingness of users to accept and utilise technology and also management and IS. It was proposed by Davis, Bagozzi and Warshaw (1989) as an extension of the "Theory of Reasoned Action" (TRA) and Fishbein and Ajzen (1975). The theory suggests that individual actual behaviour is influenced by intention which is in turn influenced by beliefs. It includes two external psychological perceptions, namely Perceptions of Ease of Use (PEOU) and Perceptions of Usefulness (PU) as well as the influence of attitude upon individual behavioural intentions (see Figure 3.5). Davis, Bagozzi and Warshaw (1989) described PU as the extent to which a person believes that the use of a particular technology will lead to an improvement in job performance, whereas PEOU relates to a person's belief that using a particular technology will be effortless. The model is able to explain around 40% to 50% of the variance (Park, 2009).



Figure 3.8 "Technology Acceptance Model" (Davis, 1989a)

Despite its wide use and acceptance in the literature, TAM, unlike TRA, has been criticised for ignoring important predictors, such as social norms. As a response to such limitations, Venkatesh and Davis (2000) proposed a model called TAM2 which incorporates subjective norms that were found to have a positive influence on the individual's personal image of perception of the use of technology; and this explained 60% of the variance. Another limitation discussed by Benbasat and Barki (2007) is that the model has predictive power but that it is difficult to project it further. They also stated that the PU and positive beliefs were found to be significant by TAM but not by TRA and TPB. Also, the focus in TAM is on the acceptance of technology rather than the behaviour in using such technology, which leads to the elimination of emotional considerations. Consequently, incorporation of TAM with other models is considered by some researchers to overcome such limitations.

Diffusion of Innovation Theory is unlike the theories previously discussed, which focus on the acceptance of technology. It focuses instead on the dissemination of the technology, system or services. This theory was proposed by Everest Rogers in 1962 and is one of the most influential sociological models of innovation diffusion. The model is used to explain and evaluate the spread of new ideas, new technology or innovations among users (Rogers, 2010). According to Rogers (2003, p.12), diffusion is the means

"by which an innovation is communicated through certain channels over time among the members of a social system". Thus, diffusion is more concerned with the dissemination and spread of what is perceived by individuals as new. Everest Rogers described innovation as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p.12). Moreover, he explained the process by which an individual or unit to adopt passes from first knowledge of an innovation to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision to adopt an innovation". According to the theory, there are five characteristics that determine the rate of adoption of an innovation, as follows (Rogers, 2003):

- Relative advantage: The individual perception of the new idea as better than the preceding one in terms of economics, convenience, satisfaction and social prestige.
- Compatibility: The individual perception of the new idea to be compatible with his/he current value, need as well as past experience.
- Complexity: The individual perception of the use of new idea is difficult or easy.
- Trialability: The availability of the new idea to be tested or experienced by an individual for a limited time or on a restricted basis.
- Observability: the ability of the individual to recognise the outcome of the new idea or innovation.

Therefore, a new innovation, system or technology characterised by greater relative advantages, compatibility, trialability, observability as well as freedom from complexity would have a greater rate of adoption and would spread more quickly (Rogers, 2010). According to Molanazari and Zeraati Fard (2012), all characteristics of innovation are important measures of technology dissemination, except observability and trialability, as these are difficult to measure.

According to Blau (1964); Luhmann (1979) trust is an important factor in defining social relationships as well as individual expectations and behaviour. Belanger and Carter (2008) introduced a model of trust and risk with the study of e-gov. The model consists of four main elements:

- Perceived Risk: Individual perception of uncertainty or adverse outcomes.
- Trust toward the Internet: willingness to take risks associated with the use of Internet.
- Trust toward the Government: willingness to take risks associated with the behaviour of government.
- Disposition to Trust: The individual's general disposition to trust others.

This model asserts that the intention to adopt and use e-gov is positively influenced by trust toward both government and the Internet, and both of these are positively influenced by a disposition to trust. Whereas, trust e-gov negatively influences perceived risk which in turn negatively influences individual intentions to use e-gov (Belanger and Carter, 2008) (see Figure 3.6).



Figure 3.9: Model of Trust and Risk (Belanger and Carter, 2008)

3.3 Using and Integrating TAM, DOI and Trust

The integration of TAM, DOI and trust are based on many perspectives. The selected theories and model have substantially added to an understanding individuals' acceptance of e-gov, and have been adopted in several studies, specifically in IS/IT related applications and online-related applications (Choudhury and Karahanna, 2008; Lucas Jr and Spitler, 1999; Prescott and Conger, 1995; Venkatesh and Davis, 2000). The integrated model seeks to benefit from the reliability, parsimony, robustness and validity of other constructs to enhance the explanatory and the predictive value of the model (Conrad, 2009; Conrad, 2013; Lee, Kozar and Larsen, 2003; Mustonen - Ollila and Lyytinen, 2003). The role of trust, culture, and social influences have played important roles in the study of e-gov generally but have received less attention in the context of e-gov in KSA.

Activities related to intention are more likely to be explained in terms of TAM than in terms of other models (Gefen, Karahanna and Straub, 2003a; Gefen and Straub, 2000; Rose and Straub, 1998; Straub, Keil and Brenner, 1997; Taylor and Todd, 1995b). TAM has been used successfully in studies of job related activities and in different organisational and non-organizational contexts, including applications related to online activities (Agarwal and Karahanna, 2000; Davis, 1989b; Gefen, Karahanna and Straub, 2003a; Gefen and Straub, 2000; Tung, Chang and Chou, 2008b; van de Wijngaert, 2010; Venkatesh and Davis, 2000; Wang and Qin, 2005; Xie *et al.*, 2017; Yan and Changfeng, 2010; Yan, Changfeng and Yingwu, 2010). In fact, Perceptions of ease of use, Perceptions of usefulness as well as behaviours intention relations in TAM have indicated high consistent and valid findings in understanding individual acceptance to diverse IT/IS and online related application. However, there have been some inconsistent findings resulting from the effect of perceived usefulness on intention (Gentry and Calantone, 2002; Tsang, Ho and Liang, 2004), and there is a need to further

examine this link with different analytical techniques, as it is utilised in this study (fsQCA).

TAM and DOI constructs complement one another in different domains other (Agarwal and Prasad, 1998; Moore and Benbasat, 1991), and their integration provide a better understanding of individual behaviours in contexts such as e-commerce, e-mobiles, virtual store and e-gov (Gillenson and Sherrell, 2002; Karavasilis, Zafiropoulos and Vrana, 2010; López-Nicolás, Molina-Castillo and Bouwman, 2008; Wu and Wang, 2005; Wu, Wang and Lin, 2007). DOI also consists of factors that affect individuals' intention to adopt new technology. The highly consistent results among those factors are those associated with relative advantages, compatibility and complexity (Agag and El-Masry, 2016a; Lu et al., 2011), and so they have been employed in this study of the factors which impact the intentions to adopt e-gov in KSA. KSA scores highly on collectivism and respect for relatives and other important individuals, and it is thought that social influences might make a major contribution in individual attitudes to the acceptance of e-gov. As governmental transactions and interaction in KSA can be conducted in either ways by using e-gov or the conventional way (face to face), individuals might consider it as a life style choice and adopt to seek an enhancement to his/her personal social statues (López-Nicolás, Molina-Castillo and Bouwman, 2008). Furthermore, when technology as e-gov is considered new and other ways of conducting government services still exist, individuals probably will look around seeking opinions from trusted other who have already evaluated the system (Gefen, Karahanna and Straub, 2003a). Thus, it is integrated in the model as it probably carries significant weight in decisions to adopt e-gov.

An e-gov system, undoubtedly, goes beyond an IS/IT through which citizens interact and transact. In engaging with governmental entities, trust is an important aspect, particularly when, transactions involve a degree of risk (Reichheld and Schefter, 2000),

such as e-gov. E-gov involves dealing with devices such as computers and mobile phones, which allow citizens to perform transactions and interactions with "government" through accessing the Internet and using e-gov webpages. It is difficult to limit trust as a social element such as trusting government staff, who deal with transactions from behind desks, to fulfil their commitments. Instead, trust toward technology and e-gov webpage are important whether they are, capable and integral part of the whole system or not. Because there are no visible guarantees for individuals in the context of a new system that the technology, the government or the webpages are reliable, trust can be considered an important element of online transactions, such as e-gov (Gefen, Karahanna and Straub, 2003a; Gefen and Straub, 2000; Reichheld and Schefter, 2000).

This is particularly important when the use of the new system is still voluntary and the conventional way exists in parallel with that system, as is the case with e-gov in KSA. Humans by nature seek to understand their environment and the behaviour, although the latter are not always predictable and rational (Gefen, 2004; Gefen, Karahanna and Straub, 2003a; Gefen and Straub, 2000). Thus, individuals usually adopt complexity reduction techniques through trust, especially in an unregulated and unruled environment (Gefen, 2004; Grabner-Kraeuter, 2002; Luhmann, 1979). The complexity of e-gov might lead individuals to avoid its adoption (Gefen, Karahanna and Straub, 2003a). The relation between TAM and trust has been discussed in detail in previous studies which have concluded that trust is a direct predictor of perceived ease of use and individual intention e.g. (Gefen, 2004; Gefen, Karahanna and Straub, 2003a). Furthermore, trust is found to a critical element and one of the obstacles which require to be dealt with to guarantee a successful use of the e-medicine system in a study conducted by Smith and Manna (2004). The culture of KSA, in particular, is characterised by a high level of uncertainty avoidance and collectivism, as well as by its tribal and monarchical system, and trust is integrated in the model as an important element of this study.

3.4 Research Hypothesises Development

Technology Acceptance Model and Diffusion of Innovation are prevailed as foundational framework in the current research with the extension of trust aspects to promote a conceptual framework for the adoption of e-gov services in KSA Figure 3.7. To enhance the model, Culture (Uncertainty Avoidance) has been incorporated in to conceive the impact between each innovation's factor and intention to use e-gov system. The trust element is utilised in respect to interpersonal trust toward this research.



Figure 3.10 Research model of e-gov adoption in KSA

Trust

A number of studies state that individuals are unwilling to adopt e-gov because of several issues related to trust level, privacy level and worries regarding security measures (Belanger and Carter, 2008; Rotter, 1967). According to Rotter (1967), trust describes the expectation that a person or group is reliable. In the current study, three trust constructs will be examined viz, Trust in Government and Trust in Technology as an antecedents of Trust in e-gov websites. Trust towards government in the current research refers to individuals' expectations that government employees can be relied upon and are going to do what they are supposed to do instead of citizens need to attend their applications personally (face to face) to monitor the process and make sure they are done as expected. It is not meant in this research to measure the trust in the government as a political system or party as this is beyond the current research objective. Trust toward technology in the current research refers to individuals' expectations that technology can be relied upon as a means of conducting e-gov. Lastly, trust toward egov webpages refers to individuals' expectations that government webpages can be relied upon as a single point of transacting and sharing information.

Several studies have been conducted in the literature in respect of the influence of trust in government and trust in technology; however, the findings were contradictory not only between countries but also between different samples' groups who live in the same country. For example, Carter and Belanger (2004b) investigated the influence of trust in government and trust in technology on citizens adoption of e-government in the USA. The sample group was students. The findings indicated that trust towards government and the internet had an insignificant effect on students' intention to adopt the system. Carter and Bélanger (2005a) repeated the same study in USA in 2005 but the sample group was USA citizens. More interesting is that the findings were contradictory to the first study as trust toward government and the internet had significant influence on citizens adoption of e-gov. Citizens of United States of America were surveyed by GAO (2001) and the finding revealed that although individuals believe in the advantages of their egov system, they expressed worries regarding the risks involved in use of the internet as a means for transacting and sharing private data.

Another example of a comparative study of two countries, the U.S.A. and the UK, was conducted by Carter *et al.* (2016) to investigate trust toward government and the internet on citizens' adoption of e-gov in both countries. The findings also were contradictory as the influences of trust toward government and the Internet on citizens adoption of e-gov were significant in the USA sample but were not in the UK sample. These findings provide clear and convincing evidence that trust need to be investigated further in different context with a representative sample of the whole population to have a better understanding of such phenomena. This is particularly important in a context such as KSA that is characterised with high uncertainty avoidance culture index, monarchy system, tribal system and conservative society in addition to a lot of criticisms received in term of transparency in Gulf Countries including KSA.

When confidence exists between government and individuals, their trust toward government will likely increase (Reddick and Roy, 2013) and this will be reflected as perceived integrity as well as reliability (Belanger and Carter, 2008; Benbasat, Gefen and Pavlou, 2008; Lee, Kim and Ahn, 2011; Srivastava and Teo, 2009). Establishing trust between government and individuals is considered an evolutive procedure (Srivastava and Teo, 2009), implying that the consistency of individuals' trust toward government is based on the ways that the latter operates in practice (Karkin and Janssen, 2014). However, little attention is given to the role of trust toward in e-gov literature (Beldad *et al.*, 2012; Lee, Kim and Ahn, 2011; Schaupp, Carter and McBride, 2010). Some attention is devoted to individuals' trust toward technologies as a strong predictor but little attention has been given to the individual's trust toward government as a strong ancestor of trust (Belanger and Carter, 2008; Jafari *et al.*, 2011; Teo, Srivastava and Jiang, 2008). The existence of individuals' trust toward e-gov webpages is likely to depend on their trust toward government (Belanger and Carter, 2008; Lee, Jung and Kim, 2011; Schaupp,

Carter and McBride, 2010; Teo, Srivastava and Jiang, 2008). Government programmes with the existence of such trust toward them and trust toward e-gov will be consequently trusted by individuals (Lee, Kim and Ahn, 2011; Srivastava and Teo, 2009; Teo, Srivastava and Jiang, 2008). Simply said, individuals readiness for e-gov adoption depends on their trust toward technology as well as in government (Beldad, De Jong and Steehouder, 2011; Beldad *et al.*, 2012; Lee, Kim and Ahn, 2011; Reddick and Roy, 2013).

Individuals' use of technology have been primarily predicted by their trust toward it, and trust is considered an essential variable in understanding the perceptions of those individuals (McKnight and Chervany, 2001; McKnight, Choudhury and Kacmar, 2002). This is particularly evident when taking into account worries in respect to security issues and privacy issues which could be considered an obstacles to e-gov usage (Belanger and Carter, 2008; Benbasat, Gefen and Pavlou, 2008; Lee, Kim and Ahn, 2011). Thus, an assessment of individuals' trust toward technology is a valuable predictor (Srivastava and Teo, 2009). Here, individuals' trust toward technologies is simply their trust toward the means that are employed to help them in accessing and delivering the required services (Beldad, De Jong and Steehouder, 2011; Weerakkody *et al.*, 2013). In brief, for e-gov to be trusted to promote and motivate individuals to transact and share their personal data, their trust toward technology is an important consideration.

In the literature of electronic commerce or online shopping, webpages are the main means used by individuals to interact or transact, therefore, it is highly important for those online shops to be the prime influences determining how those consumers perceive them (Lee and Koubek, 2010). The prime influencers that have an impact on individuals' trust are their trust toward the Internet, which in linked individuals' beliefs in respect to its dependability and safety as mean for them to safely transact and interact, and employees' abilities to provide the required services confidently. According to George (2002), in the case of individuals who are experienced in Internet use, their

worries in respect of the associated risk of adopting new technologies are low and that implies a negative relationship between them.

In view of the importance of uncertainty avoidance in Saudi culture, exceptional efforts are required to give citizens more confidence in technology and to increase levels of trust. Furthermore, e-gov within the bound of KSA is still at a developmental phase compared to that in countries such as the UK or the USA, and many of the advantages are still unknown to individuals. The utilisation of e-gov in KSA is optional, and despite efforts made by government to promote the system, the traditional ways of using governmental services still work in parallel with the e-gov system. This is particularly important as it could lead citizens to make comparisons between the ways of interaction with government in term of which one of them they trusted more. With respect to culture, it is more likely that individual experience uncertainty when confronting a new product or service, such as e-gov (Anne Lee, Garbarino and Lerman, 2007). Rationally, individuals might adopt strategies that reduce uncertainty (Dacin and Smith, 1994), for example by increasing their familiarity with the new product or service (Anne Lee, Garbarino and Lerman, 2007). This provide a convincing evidence of the importance of trust in e-gov adoption in such setting and context of KSA.

The effect of trust toward government in KSA was tested by Choudrie, Alfalah and Spencer (2017). Their study however was restricted to older Saudi citizens. In contrast, the current study targets different ages, genders and geographical locations, with samples sufficiently large to be representative. Among the limitations of previous studies of trust toward technology conducted in KSA is that they target specific cities (Alateyah, Crowder and Wills, 2013; Alomari, Woods and Sandhu, 2012b; Alomari, 2014; Alomari, Sandhu and Woods, 2009; Choudrie, Alfalah and Spencer, 2017; Weerakkody *et al.*, 2013), and are not representative of both genders and all age groups. The present study proposes to obtain wider insights regarding Saudi citizens' trust toward technology, trust toward government and trust toward e-gov websites. The following three hypotheses are proposed:

- Hypothesis 1. Trust toward government in KSA positively impacts trust toward e-gov webpages.
- Hypothesis 2. Trust toward technology in KSA positively impacts trust toward e-gov webpages.
- Hypothesis 3. Trust toward e-gov webpages in KSA positively affects intentions to use e-gov services.

• Relative Advantages, Compatibility, Complexity, and Intentions to Use E-gov System

Relative Advantages is described as the scope to which that an individual perceives a new innovation as superior to the one it replaces (Rogers, 1983, p.213). For the purpose of this research, a relative advantage is considered to be the extent of individuals' perception that interactions and transactions using e-gov webpages is better than the conventional ways in which they interact with government. An empirical study by Ojha, Sahu and Gupta (2009) in the context of electronic- systems for filing taxes in India revealed that individual's intention to adopt the services is significantly influenced by the relative advantages.

In the case of travellers who shop online, their perceptions of relative advantage have been found to influence their intentions to buy on the Internet (Christou and Kassianidis, 2002; Kim, Kim and Leong, 2005; Kim and Lee, 2006; Moital, Vaughan and Edwards, 2009; Wong and Law, 2005). As far as the author knows, there is no examination of the link between the perception of relative advantage and trust toward e-gov in the literature. Venkatesh *et al.* (2003c) argued that there is similarity between PU in TAM and relative advantages in DOI. Shin (2010), however, explained a crucial difference between the two constructs as, in relative advantages, the participants compare

the new (i.e. technology) with what it has replaced (i.e. conventional way) to reach a conclusion or a decision, whereas, this is not the case when participants make evaluations of usefulness. Relative advantage is therefore included in the model for the present study, in which Saudi citizens' perceptions in respect to e-gov services and systems are in contrary to conventional approaches of interacting with the government. Therefore, the two following hypotheses are also proposed.

- Hypothesis 4: A high level of perception of relative advantages positively relates to a high level of trust toward e-gov webpages.
- Hypothesis 5: A high level of perception of the relative advantages positively relates to a high level of intention to use e-gov services.

According to Rogers (1995) in DOI theory, compatibility can be described as individuals' perceptions that the new technologies or systems that are adopted (in this research, e-gov) are compatible with their culture, society and their styles of living compared with the one it replaces. Therefore, compatibility plays an important role in the dissemination of novel technology (Rogers, 2003). In a study conducted by Taiwan, Hung, Chang and Yu (2006a), compatibility was a factor that predicted willingness to make tax returns online. Shareef *et al.*(2011) found that social and cultural values play a significant part in the compatibility of a system. The existence of gender segregation in KSA and Saudi women's limited access to technology (Siddiqui, 2008) reinforce the need to examine the role of compatibility in this study. Another hypothesis has therefore been added.

Hypothesis 6: High level of perception of compatibility positively relates to the high levels of intention to use e-gov services.

Rogers (1983, p.230) describes complexity as the individual's perception that new technology is difficult to understand and to use. A study conducted by Slyke, Belanger

and Comunale (2004) indicated that complexity construct of diffusion of innovation theory (DOI) is similar to Perception of Ease of Use (PEOU) construct of TAM. Other researchers, however, distinguish between the two constructs, although studies of e-gov show that both constructs are significant predictors, particularly in less advanced nations (Alomari, Woods and Sandhu, 2012a).

Predictably, new technology that is easy to understand will be more widely adopted than technology that requires the learning of complex new skills. (Rogers, 1995). In similar vein to the similarity between perceptions of usefulness and relative advantages discussed previously, perceptions of ease of use in TAM is seen as being similar to complexity in DOI theory (Venkatesh *et al.*, 2003b). Some prior studies indicated the likeness between both constructs (Davis, 1989b; Moore and Benbasat, 1991; Wu and Wang, 2005). However, a crucial difference between the constructs is in complexity participant compare between the new for example (e-gov) and the previous one it replaces (conventional way) to reach a conclusion or a decision (Shin, 2010). Whereas, this is not the case when participants evaluate their perception in respect to ease of use. Based on that, the following hypothesis is proposed.

Hypothesis 7: High level of perception of complexity negatively relates to high level of intention of using e-gov services.

• Culture "Uncertainty Avoidance"

The current study includes an examination of cultural elements, as proposed by Hofstede (1980). In a 1991 study, Hofstede, used an approach borrowed from computer programming to describe the ways in which individuals think and feel and the effects on action of cumulative life experience. He refers to as 'mind programming'. Each individual's programme is different, depending on his or her social circumstances and the values of the surrounding culture. Hofstede identified four elements of the programming. These are based on factors that differentiate one culture from another, and are constituted of masculinity/feminiity, individualism/collectivism, power distance, and long term orientation (Hofstede, 1980; Hofstede, 2001). People with an orientation low on power distance, masculinity, and uncertainty avoidance and high on individualism prefer to be free from rules and regulations. On the other hand, people with cultural characteristics that have high value in terms of power distance, masculinity, uncertainty avoidance and collectivism prefer rules, regulations and firm structures. Traditionalists are more likely to follow conventional approaches in their interactions, transactions and requesting information from their governments in preference to employing e-gov systems.

The impact of the culture have been recognised as an identification way of a context that is characterised with less potential to accept new product or services by examining how culture affect individuals responses to those product and services (Anne Lee, Garbarino and Lerman, 2007). Many prior studies indicated that culture affects the diffusing activities (Cosmas and Sheth, 1980; Parthasarathy, Jun and Mittelstaedt, 1997), the diffusing rate (Farley and Lehmann, 1994; Lynn and Gelb, 1996) and the innovativeness of individuals (Steenkamp, Ter Hofstede and Wedel, 1999). However, as mentioned previously there are many cultural dimensions have been introduced in the literature.

Among those cultural dimensions described in the literature, uncertainty avoidance is the most relevant to any discussion of the adoption of new products and services (Maheswaran and Shavitt, 2000). Several studies conducted in different countries, such as France, Germany and USA, have consistently found that high scores in the category of uncertainty avoidance is linked to a smaller amount of diffusion of innovative technological products and services (Anne Lee, Garbarino and Lerman, 2007; Lynn and Gelb, 1996; Singh, 2006; Steenkamp, Ter Hofstede and Wedel, 1999; Yeniyurt and Townsend, 2003). Uncertainty avoidance is described by Hofstede (2003) as the degree to that an individual in a particular cultural context feels intimidated by

ambiguous and unknown events that their result cannot be predicted or interpreted. So, an individual with low uncertainty avoidance orientation tolerates uncertain situations, vagueness and diversity more than an individual with a high uncertainty avoidance orientation (Hofstede, Hofstede and Minkov, 2010). According to Hofstede (2003), KSA has one of the highest score of uncertainty avoidance, and therefore, it is important that this characteristic is investigated and included in the model.

Several studies in the different literature indicated that culture affect the diffusion activities of a new product or services, their adoption rate and individual creativeness (Cosmas and Sheth, 1980; Farley and Lehmann, 1994; Steenkamp, Ter Hofstede and Wedel, 1999). Nevertheless, there is no obvious evidence as to which one of the cultural dimensions has the most influence. However, in respect to adoption literature, uncertainty avoidance as mentioned previously, is the most conceptualised dimension in adoption (Maheswaran and Shavitt, 2000).

For culture contextual study, Becker (1982, p.521) state that "culture is continuously created and shaped by people, according to their own perspectives". However, "cultures can be viewed as repositories of widely shared values and customs into which people are socialised so that they can function as good citizens or as full participants" (Bryman, 2008, p.18). Based on that, individuals could be mannered by their cultural context, hence culturally valued and firmly believed doctrines are incorporated. The current research investigates e-gov adoption from citizens' viewpoint. Aspects related to culture and society are exterior entities and each one has its own reality.

On the basis of previous observations on the high degree of uncertainty avoidance in KSA and its relation to the adoption of e-gov, the following hypothesises are proposed:

Hypothesis 8a: Culture (uncertainty avoidance) moderates the link between relative advantages and intention to use e-gov.

- Hypothesis 8b: Culture (uncertainty avoidance) moderates the link between compatibility and intention to use e-gov.
- Hypothesis 8c: Culture (uncertainty avoidance) moderates the link between complexity and intention to use e-gov.
 - Perception of Ease of Use, Perception of Usefulness, and Intention to Use E-gov System

As stated previously, Davis (1989b) introduced the Technology Acceptance Model (TAM) that helped to explain and predict individuals' willingness to accept the use of technology (Davis, Bagozzi and Warshaw, 1989; Lam, Cho and Qu, 2007). Based on the model, Davis stated that perceptions of ease of use and perceptions of usefulness are highly vital in predicting individuals' intentions to accept technologies as well as their related use. The author described the individual's perception of ease of use as the extent to which individuals believe that utilising a specific technology is effortless (Davis, 1989b, p.320). Several prior studies reveal that consumers' perception of ease of use significantly and positively influences their trust (Gefen, Karahanna and Straub, 2003b; Tung, Chang and Chou, 2008a).

The integration of trust with TAM constructs is supported by several studies (Aloudat *et al.*, 2014; Gefen, Karahanna and Straub, 2003a; Liébana-Cabanillas, Sánchez-Fernández and Muñoz-Leiva, 2014; Pavlou, 2003b). According to Liébana-Cabanillas, Sánchez-Fernández and Muñoz-Leiva (2014), perception of ease of use is predicted by trust. That conclusion relied on the finding that individuals' trust toward technology decreases to some extent their requirement for the system to be understandable and controllable and thus, the tasks they perform to be effortless. The influence of trust on individuals' perception of public values is also supported by several researchers (Deepak Sirdeshmukh, Jagdip Singh and Sabol, 2002; Grimsley and Meehan, 2007).

According to Davis (1989b, p.320), individuals' perception of usefulness is described as the extent that individuals believe that utilising a specific technology is likely to improve their tasks performance. For the purpose of this research, individuals' perception of usefulness is described as the extent that individuals believe in utilising e-gov is likely to improve their performance of tasks. Past studies in conformity with the finding that a positive and strong link exists between individuals' perception of usefulness and their perception ease of use (Ayeh, 2015b; Kim, Ferrin and Rao 2008; Morosan 2012). According to TAM, perception of usefulness significantly determines individuals' acceptance of IT/IS and its related applications (Davis, 1989b; Hart and Porter, 2004; Lee, Hsieh and Hsu, 2011).

The importance of including variables such as perceived usefulness and perceived ease of use in this research is that e-gov in KSA not compulsory. Although there have been continual efforts by government media, intermediaries and other channels related to government to promote e-gov, traditional means of relating to government persist, in parallel with e-gov systems. Therefore, three further hypotheses are therefore proposed:

- **Hypothesis 9:** Perception of ease of use positively influences trust toward e-gov webpages in KSA.
- Hypothesis 10: Perceptions of ease of use positively influences perceptions of usefulness in KSA.
- Hypothesis 11: Perception of usefulness positively influences intention of using e-gov services in KSA.
- Social Influence

Prior studies in the literature indicate that individuals' beliefs are influenced by the social aspects, revealing the significance of considering such factor. According to Venkatesh *et al.* (2003b), Social influence can be described as the extent to which a member of a particular society believes that the use of a specific system or technology is valued by other members of the society, particularly influential or generally admired figures. However, this construct is described in different ways in the literature of technology acceptance. In UTAUT, it is described as 'social influence', whereas it is described in the Diffusion of Innovation Theory as 'image'. In the Theory of Planned Behaviour as well as the "Theory of Reasoned Action", social influences are described as 'subjective norms.'

Horst, Kuttschreuter and Gutteling (2007) found that social influences affect individuals' perception of the usefulness of adopting e-gov. Various studies conducted in less advanced nations, especially Arab nations, indicate the power of social influence. Al-Shafi and Weerakkody (2007) have revealed the crucial role played by social influence in the adoption of e-gov on citizens of Qatar. AlAwadhi and Morris (2008) produced similar results among a sample of students in Kuwait. These findings imply that when individuals decide to accept a system, their processes of acceptance are more likely to be affected by the influence of societies they are living in. Another study conducted by Srite and Karahanna (2006) concluded that in cultures characterised by high indices of uncertainty avoidance and femininity, their citizens' intentions are strongly predicted by social influences. Other studies indicate that in societies where there is a degree of failure to motivate citizens to adopt e-services, there are usually high indices of power distance and collectivism (Arslan, 2009; Erumban and de Jong, 2006). According to Hofstede (2001), KSA is a country that is characterised by high indexes of power distance and uncertainty avoidance and a low index of individualism. Accordingly, Saudis are greatly influenced by the views of others. The following hypothesis is therefore proposed:

Hypothesis 12: Social influences positively affect Saudis' intentions to use egov services.

The following Table 3.1 summarises all the proposed hypothesises.

H #	Hypothesised relationship
H1	Trust toward government in KSA positively impacts trust toward e- gov webpages.
H2	Trust toward technology in KSA positively impacts trust toward e- gov webpages.
H3	Trust toward e-gov webpages in KSA positively affects intentions to use e-gov services.
H4	A high level of perception of relative advantages positively relates to a high level of trust toward e-gov webpages.
H5	A high level of perception of the relative advantages positively relates to a high level of intention to use e-gov services.
H6	High level of perception of compatibility positively relates to the high levels of intention to use e-gov services.
H7	High level of perception of complexity negatively relates to high level of intention of using e-gov services.
H8a	Culture (uncertainty avoidance) moderates the link between relative advantages and intention to use e-gov.
H8b	Culture (uncertainty avoidance) moderates the link between compatibility and intention to use e-gov
H8c	Culture (uncertainty avoidance) moderates the link between complexity and intention to use e-gov.
H9	Perception of ease of use positively influences trust toward e-gov webpages in KSA.
H10	Perceptions of ease of use positively influences perceptions of usefulness in KSA.
H11	Perception of usefulness positively influences intention of using e- gov services in KSA.
H12	Social influences positively affect Saudis' intentions to use e-gov services.

3.5 A configuration view

Empirical studies in the literature of e-gov adoption tend to provide inconsistent and contradictory results regarding the antecedents of e-gov adoption and intention to use the system. Although some prior studies have indicated the important of the some studied factors in this research in respect to e-gov, contradictory results still exist (Alomari, 2014; Alsaif, 2014; Carter *et al.*, 2016; Choudrie, Alfalah and Spencer, 2017; Venkatesh *et al.*, 2003a). In view of the contradictions in previous studies, it is proposed that extra work is required to enhance the understanding of the role played by those variables and the interrelation between them in explaining citizens' adoption of e-gov. Many of these studies utilised SEM, whether the covariance-based-Structural Equation Modelling technique known as (CB-SEM) or the Partial-Least-Squares-Structural Equation Modelling technique known as (PLS-SEM). According to Hair *et al.* (2016), the former is usually suitable for researchers who want either to confirm theory or to compare between two or more theories, whereas, the latter is a nonparametric technique and more suitable for researchers who want to conduct either an exploratory study or to extend an existing theory. These analytical approaches postulate a symmetrical link between the variables that are studied. Furthermore, one recipe (the proposed and validated model) is used to explain the results that emerge. However, there could be internal interactions between and among these factors that affect e-gov adoption, as symmetric links can occur between factors that co-exist in sophisticated environments (O'Donohue, 2016; Woodside, 2014; Woodside, 2017).

In respect to the technology adoption literature, it has been argued that diversity in the methodical techniques employed could shed more light on the complex links between the factors studied (Bagozzi, 2007; Pappas, Giannakos and Sampson, 2017; Pappas *et al.*, 2017). The proposition of this study is that there is no single construct for trust toward government, trust toward technology, trust toward e-gov webpages, perceived ease of use, perceived usefulness, relative advantages, complexity, compatibility and social influence that explains the adoption of e-gov by citizens of KSA. However, different recipes might exist that include various combinations of the factors previously mentioned which impact Saudi citizens' adoption of e-gov. Therefore, the present study seeks to examine the proposition that a minimum of two of the previously mentioned antecedents which impact the citizens' adoption of e-gov will result in high levels of adoption. However, since there is insufficient empirical evidence that such configurations exist, hypothesises of this kind have not been proposed in the current research. Instead, an atypical configuration technique will be followed and the identification of the combined factors will be determined through the available data by utilising Fuzzy Set Qualitative Comparative Analysis (fsQCA) based on Kent (2015) and Haddoud, Jones and Newbery (2018).

3.6 Conclusion

The current chapter has reviewed various theories and models applied in the context of technology adoption, particularly e-gov adoption and use. These theories and models have been derived from various fields of enquiry, such as psychology, human behavioural theory and technology acceptance and use. To determine the catalytic factor influencing e-gov adoption and use, a range of theories and models have been discussed, comprising the "Theory of Reasoned Action" (TRA), the Theory of Planned Behaviour (TPB), the Cognitive Theory (SCT), the Motivational Model (MM), the Unified Theory of Acceptance and Use of Technology (UTAUT), the Model of PC Use, the Technology Acceptance Model (TAM), the Diffusion of Innovation Theory (DOI) and the Trust and Risk Model.

The Technology Acceptance Model and Diffusion of Innovation Theory are employed in the current research, as are the trust aspects, in the development of a conceptual framework for the study of the adoption of e-gov in KSA. To enhance the model, cultural dimension (uncertainty avoidance) is also studied to examine its influence on the link between diffusion of innovation constructs and citizens' intentions to use e-gov systems. Hypothesises have been proposed with a conceptual model to include the catalytic factors which impact the intentions to adopt and use e-gov in KSA, which is the prime objective of the study. The next chapter will discuss the methodology and the research design.

CHAPTER FOUR

METHODOLOGY AND RESEARCH

DESIGN

4.1 Introduction

In the previous chapter, the theoretical background to technology adoption and egov adoption was discussed. The key factors influencing the adoption of e-gov were also highlighted. Accordingly, a research hypothesises were proposed and a conceptual model devised. A configurational view was also presented to justify the need to investigate the combined influences of the factors studied, instead of only investigating the isolated influence of each one separately.

The current chapter will attempt to fulfil the third aim that is mentioned in the first chapter i.e., "Utilising a methodological design, method and analytical technique that help answering research questions and help evaluating and validating the proposed model in the context of KSA and identify other alternative recipes to that model". This will be based on the review of the methodology and the research designs according to the three questions and sets of aims proposed in the first chapter.

To achieve this, the current chapter presents the philosophical stance adopted in this study, the method employed, the research strategy, the design of the questionnaire and its piloting. Ethical and privacy issues will also be discussed. There is also discussion of the concepts that underpin the quantitative methods, questionnaire surveys for data collection, issues regarding the sample frame, the sample size, and sampling techniques. Measurements will also be presented that are mainly either adopted or adapted from previous studies in the literature. "Structural equation modelling"(SEM), "Fussy Set Qualitative Comparative Analysis" (fsQCA), and the procedure used for the quantitative analysis are explained. Finally, a discussion in respect to the validity and reliability of the tool is presented.

4.2 Research philosophy

According to Saunders, Lewis and Thornhill (2012), it is crucial for the philosophy of the research to be understood and for it to serve as a guide to the research approach and to ensure that the method chosen is appropriate to the subject of the investigation. This will help others to understand the assumptions behind the design and execution of the research (Krauss, 2005). Research philosophies are known as paradigms and are defined by Saunders, Lewis and Thornhill (2012, p.140) as "a way of examining social phenomena from which particular understandings of these phenomena can be gained and explanations attempted". Each research philosophy has a defined epistemology and ontology. The former is linked to the way that knowledge is accepted and obtained, whereas the latter is linked to existence itself (Blaikie, 2010). Simply said, ontology is our perception of the world, epistemology is our way of investigating that world, methodology is the way that we collect the data for the investigation, and the method is the detailed process of data collection.

Four philosophical stances are distinguished by Creswell (2009): positivist constructivist, advocacy-participatory, and pragmatic (see Fig 4.1.). Easterby-Smith, Thorpe and Lowe (2002) state that the positivist philosophical stance employs a language and a logical approach that harmonises with the empiricist approach to science. Webb (1992) asserts that the aim of positivist philosophy is to follow scientific principles by imposing scientific research methods on the study of human society. The central belief of positivists is that phenomena related to consumers and marketing need to be scientifically studied (Huberman and Miles, 2002). The positivist, post-positivist or empiricist philosophical approach to science assumes that outcomes are determined by a causal chain and that absolute truth is unattainable. The process followed by positivist researchers begins with theory and data collection, and concludes with the acceptance or rejection of the theory. Assumptions that underpin this philosophical stance are usually

applied to quantitatively conducted researches, where causal links are described in the form of proposed questions and hypothesised relationships. Objectivity and checks for bias are essential to this type of research.

Postpositivism	Constructivism
Determination	• Understanding
Reductionism	 Multiple participant meanings
Empirical observation and measurement	 Social and historical construction
Theory verification	Theory generation
Transformative	Pragmatism
• Political	Consequences of actions
Power and justice oriented	• Problem-centered
Collaborative	Phuralistic
Change-oriented	Real-world practice oriented

Figure 4.11 World Views. Source: Creswell (2009)

A second type of philosophical stance is constructivism, which is typically utilised in qualitative conducted research. Constructivist researchers attempt to understand the world around them (Creswell, 2009), normally by using unrestricted questions that enable respondents to express their perspectives as well as build meanings in a specific context. The qualitative process of this philosophical stance begins with inductive research, whereby conclusions are achieved on the basis of the data gathered, without isolating the experiences and knowledge of the researchers themselves.

A third type of philosophical stance is advocacy-participatory. This type of philosophy is also used in qualitative research (Creswell, 2009), and can also be used as the foundation of quantitatively conducted research. In this philosophical stance, action plans contained in the research aim to bring about changes in organisations or the lives of individuals. Voices of those who participate in an advocacy type of study are intended to be heeded and to cause change. The participatory philosophical stance also aims for changes, and usually begins with social issues or problems, while seeking to inspire political discussion (Creswell, 2009).

The fourth type of philosophical stance is pragmatism. It can be described as research that is conducted quantitatively and qualitatively at the same time (Leech *et al.*, 2010) and is usually associated with mixed method studies (Johnson and Onwuegbuzie, 2004). Pragmatism can be used to overcome the limitations of employing a solely positivist approach or a solely constructivist approach. It avoids the dependence on particular premises and avoids reaching a particular conclusion through dependence on generic premises (Wheeldon, 2010). According to Azorín and Cameron (2010), pragmatism is based on belief in the compatibility of the quantitative and qualitative ways, and rejects the selection of only one or the other. Pragmatists hold that meeting a particular purpose can be achieved by a free use of methods, techniques and procedures, permitting the use of multiple methods, various perspectives various means of gathering and analysing data (Creswell, 2003).

Smyth and Morris (2007), criticise the employment of a positivist philosophical stance in management studies. Its quantitative approach to management studies depends on the "Human Law of Causality", whereas the field is open ended and entails lateral thinking. Similarly, social constructivism and advocacy/participation with their qualitative approach, are criticised for their tendency to lateral thinking and the integration of the researcher with the study, which create unreliable conclusions and difficulties for other researchers who attempt replicate the results of the studies (Oppenheim, 1992).

Although these philosophical stances are mutually exclusive, positivist philosophy has come to be entrenched in various management fields. In reality, many contemporary researchers utilise elements of more than one to avoid the limitations. The divergencies lie in the extent to which a particular kind is emphasised. The research questions under consideration affect the choice of the philosophical approach that is to be adopted (Pollack, 2007; Remenyi and Williams, 1998). In addition, rationality in
respect to the construct and the conceptual framework sometimes imposes the choice of a particular philosophy on the researchers.

McCloy, Campbell and Cudeck (1994) uphold this perspective. They contend that despite the various criticisms levelled at quantitative reasoning in terms of its reliability and vulnerability to distortion in its assessment of human behaviour, its validity and reliability are sufficient to offer reasonable prognostications of human behaviour (Borman, White and Dorsey, 1995; McCloy, Campbell and Cudeck, 1994; Murphy *et al.*, 1982). Therefore, despite the limitations of the adoption of quantitative reasoning in the estimation of behavioural measures, the evidence suggests that it has proved its worth over a long period and that it is suitable for the current study. Among the advantages of a positivist approach to the current research is its potential for establishing convergent and discriminant validation in respect to the pertinent literature.

There are other reasons for the choice of positivist. First of all, it is consistent with the objectives of the research, which is to apply measurements of cause and effect to test theories intended to discovering the catalytic factors which impact e-gov adoption in KSA. Positivism seeks objective reality by using a systematic method to measure the relationship between studied variables. Secondly, the research will be based upon proposing hypothesises and testing of theories, which accords with a positivist approach. Thirdly, using positivist assumptions will enable the findings of the study to be generalised. Fourth, the study requires accurate data with reliable and valid measures with regard to individuals' adoption of technologies by utilising a systematic conceptual framework. Fifth, adopting positivism ensures flexibility and the potential for other researchers to replicate the study. Sixth, the research attempts to respond to the call for diversification of the methodological and analytical techniques in the literature of technology acceptance and e-gov adoption literature, and of the links between the factors studied, using Fuzzy Set Qualitative Comparative Analysis.

4.3 Research's Approach

Research approaches are of two types, deductive and inductive. The former is described as the procedure of inference based on a reasoning approach which derives from the general to the specific (Rothchild, 2006, p.3). This approach is mostly combined with the testing of theories, hypothesised relationships, and strategic plans intended to test them (Bryman, 2012; Lawson, 2005), and is characterised by three aspects. The first is the utilisation of hypotheses to quantitatively demonstrate the causal link between constructs. The second is operationalisation of concepts so that they fit the quantitative approach. The third one is that the required sample should not be too small to permit an accurate and precise statistical analysis, which in turn will help in generalising the findings of the study (Saunders and Lewis, 2000).

The other approach is the inductive one. This approach is described as the procedure of inferencing generic laws based on the observation of specific cases (Rothchild, 2006, p.2). This approach is stented toward establishing theories. Theories are built on the basis of the data that is collected and analysed. Inductive research is usually concerned with why something is occurring, whereas the deductive approach is usually concerned with demonstrating what is occurring (Saunders *et al.*, 2011). The choice of either an inductive or a deductive will depend on the philosophical stance that is selected, although the inductive and the deductive approaches are not completely dissimilar. The figure below (Figure 4-2) shows the procedure of both approaches.



Figure 4.12 Inductive and Deductive Approaches, adopted from Othman and Ibrahim (2013) According to Williams (2011), researchers may adopt both at the same time, and this can be advantageous for the research (Saunders *et al.*, 2011). The current study is conducted deductively in accordance with the positivist stance that has been adopted. The positivist approach will help to test the propounded conceptual model, examine the interrelation of the variables that are studied, and employs methodological and analytical techniques to shed the light on the complex links between them. Consequently, quantitative statistical analysis will help in generalising the findings. This has been achieved by conducting a literature review in respect to the topic, as seen in Chapter Two. Many critiques of the literature were identified in 2.10. Much research has dealt with egov adoption and technology acceptance in contexts other than KSA, and these can be utilised as a foundation of the proposed model, and the current research will be built on the foundations of e-literature. This concatenation fits the deductive approach well. The literature review is performed in the setting of the current study to have a comprehensive grasp of the available theories and consequently build and hypothesise model in such basis. Data is collected and then analysed to discover whether or not it is in accordance with the hypothesised relationships and whether they conform to the theories from which the proposed hypotheses are generated (Saunders et al., 2011). This approach will be of assistance in generalising the outcomes (Saunders *et al.*, 2011). The deductive approach

is normally used in research that is conducted quantitatively and over a shorter period of time than the inductive approach (Bryman, 2012). This also helps the researcher to predict the duration of the study.

4.4 Research's Methods

When a researcher is planning a study, its aims and objectives play an important role in the selection of the method utilised which, as we have seen, can be quantitative, qualitative, or a mixture of both. Quantitative method, which is linked to positivism philosophy, usually concerns with quantified data or number and then test them by using a statistical tools and technique to make sense of them (Creswell, 2009). In contrast, qualitative method, which is linked to constructivism philosophical stance, is usually utilised to deeply understand a particular issue relying in the researcher's interpretations of participant words rather than quantified data (Bryman, 2008; Kothari, 2004). The available methods are presented in the table below (Fig 4.2)

Tend to or Typically	Qualitative Approaches	Quantitative Approaches	Mixed Methods Approaches
 Use these philosophical assumptions Employ these strategies of inquiry 	 Constructivist/ transformative knowledge claims Phenomenology, grounded theory, ethnography, case study, and narrative 	 Postpositivist knowledge claims Surveys and experiments 	Pragmatic knowledge claims Sequential, concurrent, and transformative
Employ these methods	 Open-ended questions, emerging approaches, text or image data 	 Closed-ended questions, predetermined approaches, numeric data 	Both open- and closed- ended questions, both emerging and predetermined approaches, and both quantitative and qualitative data and analysis
Use these practices of research as the researcher	 Positions him- or herself Collects participant meanings Focuses on a single concept or phenomenon Brings personal values into the study Studies the context or setting of participants Validates the accuracy of findings Makes interpretations of the data Creates an agenda for change or reform Collaborates with the participants 	 Tests or verifies theories or explanations Identifies variables to study Relates variables in questions or hypotheses Uses standards of validity and reliability Observes and measures information numerically Uses unbiased approaches Employs statistical procedures 	 Collects both quantitative and qualitative data Develops a rationale for mixing Integrates the data at different stages of inquiry Presents visual pictures of the procedures in the study Employs the practices of both qualitative and quantitative research

Figure 4.13 Research Scenarios. Source: Creswell (2009)

Each method has a different focus. The quantitative method is normally used to generalise the findings of the research (Creswell, 2009). However, this often requires a

large sample to be statistically analysed according to the criteria of representing the population and generalisation. Targeted close-ended questions are used to help participants to answer quickly (Saunders *et al.*, 2011). The primary goal of the qualitative method, by contrast, is not to generalise the findings but to gain a deeper understanding of the problem. Thus, the sample required in the latter method is usually not as large as quantitative method and there is no need for it to be statistically tested and analysed (Saunders *et al.*, 2011). There is more flexibility in the collection of data in the qualitative method, but more time is needed for its collection. Bryman (2012) raises concerns over isolating the two methods and asserts that each method can help to overcome the weaknesses of the other.

The current research's aim, objectives and the inquiries that need to be answered significantly contribute in selecting one of the aforementioned research methods. The focus of the research is to find the prime factors which impact the adoption of Saudi citizens to e-gov and to diversify the methodological and analytical technique to understand the interrelationship between the studied factors. To achieve this aim, a conceptual model and a hypothesis are proposed, and these depend on the available literature. However, the quantitative method is more likely to fit the requirements of the present research, which depends on an empirical validation of the proposed model and its hypothesises as well as performing an in-depth analytical technique, namely fsQCA. The cultural values of KSA also influence the choice of the qualitative method. For example, it is difficult to contact Saudi women directly and to engage them in long discussions, which creates a possibility of bias in the data collection. Quantitative data collection, in contrast to data collected qualitatively, does not require direct contact or extensive dialogue with participants and is therefore better suited to the current research.

As in this research two analytical packages have been employed to analyse the collected data from participants viz, fsQCA and WarpPLS which will be discussed in

detail later in this chapter in sections 4.8 and 4.9, few points need to be clarified in the context of the researches' selected method. Although fsQCA is called "Qualitative", it is not considered as a qualitative technique when larger anonymous cases (respondents) are involved (Mohamed, 2020). It was called qualitative because it was developed for qualitative small samples with known cases e.g. McNamara (2014), however, it is now used more for larger samples e.g. Oyemomi (2017), Pappas *et al.* (2016) and Yueh, Lu and Lin (2016). Therefore, it is not considered a qualitative, despite its name, when large and "unknown" samples are used (Mohamed, 2020). In addition to that, this is also based on the type of data that is collected to investigate the phenomena under discussion whether associated with quantitative e.g. (numbers) or associated with qualitative e.g. (interviews, text recording etc). Some studies also have employed mixed methods using fsQCA, however, fsQCA is also considered in those studies as quantitative combined with case study as a qualitative e.g. Staley (2015). Therefore, as in this research large sample size, unknown participants and the collected data is number format, a quantitative method is selected accordingly.

4.5 Research Strategy

The various methods available to researchers are not mutually exclusive (Wilkinson and Birmingham, 2003). In well conducted research, the method needs to be appropriate, reasonable and explicitly selected (Denscombe, 2007). Neglecting such principles can result in research of poor quality, vulnerable and open to criticism (Denscombe, 2007). Based on the adopted philosophical stance, three methods can be utilised. These are the case study method, the survey method and the experimental method (see Fig 4.3).

Quantitative	Qualitative	Mixed Methods
 Experimental designs Nonexperimental designs, such as surveys 	Narrative research Phenomenology Grounded theory Ethnographics Case study	 Convergent Explanatory sequential Exploratory sequential Transformative, embedded, or multiphase

Figure 4.14 Research Strategies. Source: Creswell (2009)

The experimental method is normally employed in laboratory research, where precise, systematic and direct manipulations of behaviour can be observed by the investigator (Yin, 2003). An experimental method would not be suitable for the current research, which entails collecting samples using questionnaires (Yin, 2003).

A choice between case study and survey is therefore to be made, and a guide to the selection of a method, proposed by Bailey (2005) can be seen in Table 4.1 below. Since the theoretical foundation of the current research involves the collection of data, from which conclusions are deduced, there is no justification for the choice of a case study, as the latter is better suited to inductive studies and the establishment of theories. Consequently, a survey has been selected as the most appropriate research technique for this study.

Surveys can be either longitudinal or cross sectional. The former focuses on examining the constructs studied over a considerable period. Researchers are thereby able to record observational changes, while maintaining some degree of control over the constructs studied. Despite such flexibility, a longitudinal survey tends to take longer and can be costly. Furthermore, this type of survey usually requires a small sample so that observation and changes can be made accordingly. However, this will limit the capacity for generalisation. The cross-sectional option, by contrast, investigates a particular phenomenon at a particular time, and therefore saves costs, is more efficient and can be repeated in the future. According to Bryman (2016), the targeted sample needs to be properly selected to represent a population. For the purpose of this study, the cross-sectional technique is more appropriate for the current research which, in investigating Saudi citizens' adoption of e-gov, requires diversified methodological and analytical techniques to understand the complexities and interrelationships between the factors studied. To achieve these ends, a conceptual model and hypothesis are proposed on the basis of the relevant literature. Conducting the current research quantitatively is more likely to fit the requirements for empirical validation of the proposed model and its hypothesises and the use of an in-depth analytical technique, namely fsQCA which is discussed in more detail at the end of this chapter. Furthermore, many of the factors studied, such as citizens' perceptions and behavioural intentions to adopt e-gov, need to be captured in in a neutral, unbiased and non- manipulative way.

Strategy	Type of research question	Is control of behaviour required?	Is there focus on contemporary events?
Experiment	Who? Why?	Yes	Yes
Survey	Who? What? Where? How Many? How much?	No	Yes
Archival analysis	Who? What?Where? HowMany?Howmuch?	No	Yes /No
History	How? Why?	No	No
Case study	How? Why? What?	No	Yes

Table 4.1 Cross-categorisation and matching of research questions type and research strategy (Bailey, 2005)

4.6 Questionnaire Surveys

Questionnaire surveys are the most widely used method of data gathering, especially in management research (Veal, Leisure and . 1997). Saudi citizens will be surveyed to gain information with respect to e-gov adoption. This technique is aligned with a positivist perspective, which is the dominant philosophical stance in this field. The survey technique is the procedure of gathering inferences from a sample of participants from a particular population (Collis and Hussey, 2003, p.66). The questionnaire is divided into two categories, one administrated by the participant (selfadministrated) and the other by the researcher (interviewer-administrated). The former is often subdivided into three types. One is a questionnaire that uses the Internet as a means of distribution, usually through email, specialised webpages or social media. Another questionnaire uses the postal service as a means of distributing physical copies to participants. The third kind is delivered and collected manually. The questionnaire administrated by the interviewer entails the latter writing the participations' answers, and can be conducted either by telephone or in a face to face interview (Saunders et al., 2011). In the case of self-administrated surveys, the data is collected either by means of the Internet or by giving physical copy questionnaire to participants. However, due to gender segregation as a cultural aspects that could hinder the use of face to face questionnaires, the researcher decided on a mixture of web and email survey approaches and thereby minimize gender bias (Dillman et al., 2009; Dillman, Smyth and Christian, 2008; Parackal, 2003).

4.6.1 The Design of the Questionnaire

The questionnaire can be structured in several ways. The first of these is the closed question where participants are asked to choose between predefined responses (Saris and Gallhofer, 2014). This means, however, that the participant range of answers is limited, which could lead to a bias and a limitation of participants' more creative responses. The participants usually answer this type of question either by choosing to answer 'yes' or 'no' or by choosing from a range of positively or negatively predefined options. The second structure is the open ended design where participants are able to freely express and write their own responses in a specific text space or box (Saris and Gallhofer, 2014). This type of design is helpful for gathering new information in the

subject investigated, although there is a possibility that the researcher will face difficulties in analysing the questions and the respondents may encounter difficulties with the answers. There are also contingency questions, which are a sub-type of closed question. It is also known as a filtering question and its function is to direct the participants to another sub-question where more detailed information on the main question may be obtained (Siniscalco and Auriat, 2005).

Another type of questionnaire is semi-structured and contains blend of openended and close-ended questions. This type is proper for investigation research. Finally, there is the unstructured questionnaire, which permits respondents to freely express their points of view regarding the subject of the study. This type is better suited to quantitative research (Hague, 2002). With the object of the present quantitative study, a structured questionnaire is employed, and participants will be permitted to select the responses that best represent their points of view.

Information from participants fall into four categories: participants' knowledge; their beliefs-attitudes-opinions;, their behaviour; and their attributes (Saris and Gallhofer, 2014). The information concerning knowledge deals with individuals' degree of awareness and understanding of issues. Beliefs-attitudes-opinions assess individuals' perceptions of the issue and their thoughts, feelings and judgments with regard to it. Behaviour related information is concerned with the ways in which individuals act. Information related to attributes deals with data such as gender, age, educational level. The current research questionnaire includes a mixture of those questions (Taylor-Powell, 1998).

4.6.2 Translation

According to Saunders *et al.* (2011), there are three approaches that can be used in the translation namely, the 'direct', the 'back' and the 'parallel'. The direct approach is when a person translates the questionnaire straightforwardly. Despite the simplicity of this approach, various mistakes in the process are possible. The 'back translation' approach involves a two-way translation, the first being to transform the questionnaire into the intended language, while the second step is another person translating the questionnaire back into the previous and main written language. Finally, a comparison between both versions is conducted to make corrections. The last approach is one where translations are conducted in parallel by more than one translator at the same time. Then, the translated versions are compared with each other and the necessary corrections are made.

'Back translation' has been chosen for the present study. Following the design and preparation of the questionnaire, it is translated into the main spoken language in KSA, Arabic. However, an English version is also published, and participants will be offered a choice between the two languages. The questionnaire is also translated again into English according to the research language (Brislin, 1970). This technique is also limited in terms of variation in the number of monolingual and bilingual participants and its capacity to extend the sense of the statements beyond the limitations of literal translation (Douglas and Craig, 2007). This translation technique is chosen as the most effective for the present study. First, the researcher translates the questionnaire from English, then the translation is revised by four researchers, two of whom speak Arabic of KSA and two who are Arabic speakers from the United Kingdom. The recommendations of the four lead to the creation of a draft. Then another two specialists from KSA review the draft and the final version of the questionnaire to confirm that it is ready to be tested and piloted.

4.6.3 Piloting the Questionnaire

According to Dillman *et al.* (2009), it is important to pilot any questionnaire so that it is confirmed as readable, understandable and accessable. The current study questionaire was piloted by sending it to experts in the subject area and to academic colleagues who speak the relevant languages. Their suggestions and comments have been taken into account, including any grammatical mistakes in the English version and some Arabic expressions that can better explain the questions and the statements in the questionnair to be fully undrestood and aswered. There were five further face to face meetings with professors and doctors who are knowledgable in the area to ensure that the questionnaire is clear and understandable. Several grammar and spelling errors were found and were corrected according to the recommendations. After making sure that the questionnaire in both versions was free from mistakes, 50 questionnaires were distributed among partcipants of varying ages and educational levels. A total of 35 questionnaires were acceptable as the instructions were understood and the questionnaire completed without problems.

4.6.4 Determining the Sample for the Thesis

Malhotra (2010) specified a series of non-probability and probability sampling techniques. These are shown in Table 4.2

Non-probability Sampling	Probability Sampling
Convenience sampling	Simple random sampling
Judgmental sampling	Systematic sampling
Quota sampling	Stratified sampling
Snowball sampling	Cluster sampling

Table 4.2 Classification of Sampling Techniques (Malhotra, 2010).

Sampling techniques were categorised as either probability techniques or nonprobability techniques (Malhotra (2010). The latter was further subdivided into four types, namely convenience, judgmental, quota and snowball techniques. There is a further subdivision into four types, namely simple random sampling, systematic sampling, stratified sampling and cluster sampling..

4.6.4.1 Sampling Techniques (Non- Probability-Probability)

In non-probability, the researchers select participants on the basis of availability and accessibility. The researchers ensure that participants represent the population and that they realise that participation is not compulsory (Churchill, Brown and Suter, 2010). The non-probability technique is subdivided into the four types as mentioned above (Malhotra, 2010). Webb (2002) states that convenience sampling is the most widely used of the four. This is where investigators select participants on the basis of availability instead of choosing from the whole population. Overall, the limitation of non-probability techniques is that the variation between the selected samples and the actual population is unknown, whereas probability techniques enable researchers to calculate errors in the sampling (Webb, 2002).

Researchers often use students as representative participants, especially those researchers who investigate areas related to use of the Internet (Balabanis and Reynolds, 2001; Kim, Fiore and Lee, 2007; Li, 2002; Li, Daugherty and Biocca, 2002). The use of students as participants in a sample is favoured because they are usually skilled computer users and have fewer problems in the use of new technologies (Calder, Phillips and Tybout, 1981; Jahng, Jain and Ramamurthy, 2000). They also qualify as representatives of a population (Ferber, 1977; Yoo and Donthu, 2015).

Webb (2002) states that, in probability samples, sample units are chosen by chance. Each element (e. g., persons, households) in the population has an equal possibility of being included in the research sample. Probability technique is subdivided into four techniques, namely random, systematic, stratified, and cluster sampling (Malhotra, 2010).

Simple random sampling (SRS) is where participants are equally and fairly chosen to form a population with or without replacement (Schuman, 2008). In a randomly selected sample, each participant has an equal chance of being chosen, whereas those distinguished participants if they are chosen, a probable counterbalance in the long term by choosing the equal adverse participants, in proportion to the composition of the population (Schuman, 2008).

In the systematic sampling technique, the participants are randomly selected at first on the basis of one unit, and, then participants are selected in an even pattern until the required sample is achieved (Malhotra, 2010). Schuman (2008) states that the stratified technique is a widely utilised probability technique which is utilised to detect the characteristics of a population that the investigators required to assure will be represented in the sample. They then draw a specified quantity of subjects from each dimension of the stratum that is represented in exact proportion to their frequency in the population.

Webb (2002) states that, in a cluster technique, the population is first subdivided or clustered into two categories, a 'mutually exclusive' and a 'collectively exhaustive' division. A randomly selected sample is then taken from both divisions. The sample of the current study was required to be representative of the entire population of KSA. The sample needed to include participants that belong to various ethnic backgrounds and different parts of the country. Sample sizes, sampling techniques and the population framework of the sample needs to be specified (Malhotra, 2007; Wong and Singapore, 1999).

4.6.4.2 Sampling Population

At first, the sample in the study was to include adult Saudis citizens of both sexes, of varying levels of education and from different regions and age groups. All Internet users with experience of e-gov had the right of participation in the questionnaire without constraints. The survey will be published on different webpages, including social media and applications like e-mail, Twitter, Facebook and WhatsApp. The study was intended to focus on citizens with prior experience of e-gov systems. However, it was difficult to obtain a sample frame for e-gov users in KSA, although many attempts were made to do so. The number of users of e-gov system in KSA is unknown. Therefore, online users will be targeted and only Saudi citizens accepted who are using or have used e-gov and its services in KSA.

4.6.4.3 Sample Frame

Each participant is demanded to accomplish published surveys, and the involvement is told to be completely non-compulsory. The current study sample is focused on blogs, media webpages and applications representing different interests and preferences. In order to include a wide geographical area and a range of personality types, unrestricted sampling techniques were intended to aggregate the heterogeneity that exists in the national forums. The distributed surveys were accompanied by a covering letter which explained the purpose of the research, the participants' contributions to the study findings, their anonymity and their right to withdraw at any time.

To sum, the most suitable technique was found to be non-probability sampling. This technique is combined with an unrestrictive self-selected survey method to augment the comprehensive character of the study. This decision was taken following Saunders, Lewis and Thornhill (2012) approach to select the most appropriate sampling technique, see Figure 4.18. As data cannot be collected from whole population, statistical inferences need to be made but there is no sampling frame available, the sample need to be representative but relevant quota is not available as well, so self-selection sampling technique is selected.



Figure 4.15 Approach select an appropriate sampling technique, adopted from Saunders, Lewis and Thornhill (2012)

To motivate citizens to participate, the survey is published in different social platforms that reflect different interests, preferences and lifestyles. According to the relevant existing literature, the minimum sample size should be around 300 participants, a very good sample size would be close to 500 participants and a superior sample size would be close to 1000 participants (Comrey and Lee, 2013; Tabachnick and Fidell, 2013b). However, a test conducted to identify the minimum sample size for this research using software (Gpower) indicated that 146 participants would be enough. However, a

range between 500 to 1000 participants will be the aim of this research. More detailed discussion is presented in Chapter 5, section 5.4. It is important to mention that there are limitations to the selected sampling technique, such as the possibility of bias and the difficulty involved in generalisation. This will be discussed in the last chapter.

4.7 Measurements:

As explained in Chapter Three, 11 constructs are included in the model. The dependent construct is 'intentions to use e-gov' whereas the independent constructs are 'social influences,' 'perceived ease of use' 'perceived usefulness,' relative advantages,' 'compatibility,' 'culture,' 'complexity' and 'trust toward e-gov webpages.' The latter possesses two independent constructs, namely trust toward government as well as trust toward technology. Culture, which includes 'uncertainty avoidance', will be a moderator between 'relative advantages', 'compatibility', 'complexity' and 'intention to use e-gov services'.

The questionnaire is designed to include multiple items and a Likert scale of 5, where '1' refers to participants' strong disagreement and '5' refers to participants' strong agreement. The scales will be used for all theoretical constructs under study in the conceptual framework. Use of the Likert scale will avoid the challenges associated with developing duals of dichotomous adjectives. The scale contains a series of statements representing welcomed and unwelcomed attitudes, beliefs and perceptions with regard to the concepts investigated. The level of disagreement or agreement will be expressed by the numerical score. The scores will then be summarised in order to measure the attitudes, beliefs and perception of the participants.

The relevant previous literature and studies are reviewed to develop the measurement scales. The measurements of the variables in the conceptual framework

are within reach in the literature of e-gov and e-commerce. However, some are adapted to suit the e-gov topic.

• Trust Toward Government

Trust toward government will measure individual expectation that government employees can be relied upon and are going to do what they are obliged to do instead of citizens need to attend their applications personally (face to face) so that they can monitor the process and make sure that they are done as expected. It is not meant in this research to measure the trust in the government as a political system or party as this is beyond the current research objective. Four items are set and will be adjusted in accordance with the findings of experts and the pilot test. The measures are adopted from Belanger and Carter (2008), McKnight, Choudhury and Kacmar (2002), and Teo, Srivastava and Jiang (2008).

• Trust Toward Technology

Trust toward technology will measure individual expectancy that technology can be relied upon as a means. Three indicators are set and will also be adjusted in accordance with expert opinion and the pilot test. The measures are adopted from Belanger and Carter (2008), McKnight, Choudhury and Kacmar (2002), and Teo, Srivastava and Jiang (2008).

• Trust Toward E-gov Webpages

Trust toward e-gov webpages will measure individual expectancy that government webpages can be relied upon as a means of transacting and sharing information. Four indicators are adopted and will be adjusted based on the findings of experts and the piloting test. These measures were adopted from (Teo, Srivastava and Jiang, 2008).

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• Perception of Ease of Use

Perception of ease of use will measure the extent to which an individual believes that the use of government webpages would be easy and effortless. Eight indicators are adopted and will be adjusted according to the findings of experts and the pilot test. These measures were adopted from Castañeda, Muñoz-Leiva and Luque (2007), Chang *et al.* (2005), Davis (1989b), Kumar *et al.* (2007), and Moore and Benbasat (1991).

• Perception of Usefulness

Usefulness perception will measure the extent to which an individual believes that the use of e-gov services would be of benefit to his/her task performance. Gender indicators are adopted and will be adjusted on the basis of expert opinion and the pilot study. These measures were adopted from Castañeda, Muñoz-Leiva and Luque (2007), Chang *et al.* (2005), Davis (1989b), Kumar *et al.* (2007), and Moore and Benbasat (1991). These measures from Technology Acceptance Theory (TAM) have been extensively employed by researchers and practitioners to help in predicting and explaining individuals' acceptance of information technology (IT/IS) and its related applications.

• Relative advantages

Relative advantages will measure the degree to which an interaction with government via e-gov webpages is perceived as better than the traditional method that it replaces, such as paper-based work. Six indicators are adopted and will be adjusted in accordance with expert opinion and the pilot test. These measures are adopted from Carter and Bélanger (2005b); Davis (1989b); Gefen and Straub (2000); Jarvenpaa, Tractinsky and Vitale (2000); Moore and Benbasat (1991); Pavlou (2003a); Slyke, Belanger and Comunale (2004); Vassilakis *et al.* (2005). These measures from Diffusion of Innovation Theory (DOI) and have been widely employed by researchers and practitioners to help in evaluating the dissemination of new idea, new technology or innovations among users.

Compatibility

Compatibility will measure the degree to which a person's perception in respect to the adoption of e-gov is compatible with his or her culturally related values and lifestyle. Five indicators are adopted and will be adjusted in accordance with the criteria cited above.

These measures are adopted from Carter and Bélanger (2005b); Davis (1989b); Gefen and Straub (2000); Jarvenpaa, Tractinsky and Vitale (2000); Moore and Benbasat (1991); Pavlou (2003a); Slyke, Belanger and Comunale (2004); Vassilakis *et al.* (2005). These measures from Diffusion of Innovation Theory (DOI) and have been widely employed by researchers and practitioners to help in evaluating the dissemination of new idea, new technology or innovations among users.

• Complexity

Complexity will measure the extent to which a person's perception in respect to the use of e-gov services is difficult to understand and use. Five indicators are adopted and will be adjusted in accordance with expert opinion and the pilot test. These measures are adapted from Carter and Bélanger (2005b); Davis (1989b); Gefen and Straub (2000); Jarvenpaa, Tractinsky and Vitale (2000); Moore and Benbasat (1991); Pavlou (2003a); Slyke, Belanger and Comunale (2004); Vassilakis *et al.* (2005). As mentioned previously, these measures from Diffusion of Innovation Theory (DOI) and have been widely employed by researchers and practitioners to help in evaluating the dissemination of new idea, new technology or innovations among users.

• Social influence

Social influence will measure the extent to which the influence of respected or significant others affects an individual's use of e-gov services. Four items were adopted and will be modified on the basis of expert opinion and the pilot study. These measures are adopted from Mathieson (1991). Five indicators are used will be adjusted in accordance with experts opinion and the pilot.

The current construct is described in different ways using several models and theories. The topic is described in UTAUT as 'social influence,' in DOI as 'image', in MPCU as 'social factor's and in TPB and TRA as subjective norms.

• Intention to Use E-gov

Intention to use e-gov will measure the subjective probability that a person will use e-gov. Four items were adopted and will be modified on the basis of expert opinion and the pilot study. These measures were adopted from Venkatesh and Davis (2000). This factor and its measurement system have been extensively utilized by researchers in order to predict and explain users' acceptance of information technology (IT) or ITrelated applications such as in TAM1, TAM 2 TAM 3 and UTAUT.

• Culture

Culture will be measured by one variable, namely uncertainty avoidance.

• Uncertainty Avoidance

Uncertainty is taken to be the extent to which an individual feels uncomfortable in unfamiliar or ambiguous situations. Two indicators are adopted and will be adjusted according to expert opinion and the pilot test. These measures are derived from Hofstede (1980); Hofstede (1991); Srite and Karahanna (2006); Yoo, Donthu and Lenartowicz (2011). This factor and its measurement have been widely used in the literature. It is one of the cultural dimensions of preference for one state of affairs over another that differentiate nations as opposed to individuals from one other. Table 4.3 below summarises all the measurements adopted, with references.

Construct	Code	Items	References
Trust toward government	TRUG	 I believe that the government agency acts in citizen's best interest I believe that the government agency is truthful, honest and genuine in its dealings I believe that the government agency is competent and effective In general, the government is reliable to meet their obligations. 	(Belanger and Carter, 2008; McKnight, Choudhury and Kacmar, 2002; Teo, Srivastava and Jiang, 2008; Wang and Benbasat, 2008)
Trust toward technology	TRUT	 The Internet has enough safeguards to make me feel confident utilising it to transact personal transactions with government agencies I feel assured that legal and technological structures adequately protect me from problems on the Internet I feel confident that encryption and other technological advances on the Internet make it safe for me to transact In general, the Internet is now a robust and safe environment in which to transact business. 	(Belanger and Carter, 2008; D Harrison McKnight, 2001; McKnight, Choudhury and Kacmar, 2002; Teo, Srivastava and Jiang, 2008)
Irust toward e-gov webpages	IKUW	 This e-gov webpage is trustworthy This e-gov webpage is sincere and truthful This e-gov webpage is trustworthy. 	(Teo, Srivastava and Jiang, 2008)
Deresived assa of	FOU	Interacting with a gov	(Castañeda
use		 webpages entail lots of mental effort. My interaction with e-gov webpages is understandable. I do not see that e-gov webpages require high skills. Learning to engage with the e-gov webpages would be easy for me. I think engaging with the e-gov webpages would be a clear and understandable procedure. I would see the e-gov webpages to be flexible to engage with. It would be easy for me to become skilled at using the e-gov webpages. 	Muñoz-Leiva and Luque, 2007; Chang <i>et al.</i> , 2005; Davis, 1989b; Kumar <i>et al.</i> , 2007; Moore and Benbasat, 1991)

Table 4.3 Survey's constructs and items.

Perceived usefulness	USF	 E-gov webpages enable me to complete tasks more rapidly. Utilising e-gov webpages is time saving. Utilising e-gov webpages ease my job. E-gov webpages would enable me to complete different transactions more rapidly. I see e-gov webpages would give a worthy service for me. The content of e-gov webpages would be useless to me. 	(Carter and Bélanger, 2005b; Davis, 1989b; Gefen and Straub, 2000; Jarvenpaa, Tractinsky and Vitale, 2000; Moore and Benbasat, 1991; Pavlou, 2003a; Slyke, Belanger and Comunale, 2004; Vassilakis <i>et</i> <i>al.</i> , 2005)
Relative advantages	RELT	 Using the web would enhance my efficiency in gathering information from the e-gov. Using the web would enhance my efficiency in interacting with the e- gov. Using the web would not make it easier to explore and gather information from e-gov webpages. Using E-gov webpage would make it easier to interact with government. Using E-gov webpage would give me greater control over my interaction with government. The disadvantages of my using the E-gov webpage far outweigh the advantages. 	(Carter and Bélanger, 2005b; Davis, 1989b; Gefen and Straub, 2000; Jarvenpaa, Tractinsky and Vitale, 2000; Moore and Benbasat, 1991; Pavlou, 2003a; Slyke, Belanger and Comunale, 2004; Vassilakis <i>et</i> <i>al.</i> , 2005).
Compatibility	COMP	 I think using the web would fit well with the way that I like to gather information from e-gov. I think using the web would fit well with the way that I like to interact with the government. Using the web to interact with government would fit into my lifestyle. Using the web to interact with the government would incompatible with how I like to do things. Using E-gov webpage fits into my work style. 	(Carter and Bélanger, 2005b; Davis, 1989b; Gefen and Straub, 2000; Jarvenpaa, Tractinsky and Vitale, 2000; Moore and Benbasat, 1991; Pavlou, 2003a; Slyke, Belanger and Comunale, 2004; Vassilakis <i>et</i> <i>al.</i> , 2005).
Complexity	COML	 It is easy for me to navigate within e-gov webpages. Learning to use the E-gov webpage for exploring information and do different transaction is easy for me. I believe that it is easy to get the E-gov webpage to do what I want it to do. Interacting with E-gov webpage to explore information and do 	(Carter and Bélanger, 2005b; Davis, 1989b; Gefen and Straub, 2000; Jarvenpaa, Tractinsky and Vitale, 2000; Moore and Benbasat, 1991; Pavlou, 2003a; Slyke, Belanger

		1:00	1 0 1
		different transaction is clear and	and Comunale,
		understandable.	2004; Vassilakis <i>et</i>
		Overall, I believe that using the	al., 2005).
		E-gov webpage to explore information	
		or do different transactions is easy.	
		· č	•
Social influence	SOCL	 People who influence my behaviour think that I should use e-gov system. I would use online government services if important people to me used them People around me who use the e-gov system have more prestige. I would use online government services if I needed to. 	(Mathieson, 1991)
	•	•	•
Intention to use e- gov	INTN	 I intend to use the e-gov webpage in the near future I intend to use the e-gov webpage to access government services frequently I plan to use e-gov services from this webpage I will continue using e-gov webpages in the future 	(Venkatesh and Davis, 2000)
Uncertainty Avoidance	UNCT	 I should avoid making changes when their outcomes are uncertain to me. Rules and regulations are important because they inform me what is expected of me. Standard work procedures are helpful to me. 	(Hofstede, 1980; Hofstede, 1991; Srite and Karahanna, 2006; Yoo, Donthu and Lenartowicz, 2011).
	I	1	1

4.8 Analysis Procedures for the Survey Questionnaire

"Structural equation modelling" (SEM) is employed to quantitatively analyse the collected data. SEM is a confirmatory multivariate technique which contains the measurement errors of the proposed model and permits the analyst to calculate the path between the constructs (i.e., intentions to use e-gov) and the observed variables (items that measure the variable) (Robson, 2002). It helps in establishing both measurement and structural models and in addressing complex relationships (Hair *et al.*, 2013). PLS is selected due to its ability to permit easily the representation of both formatively and

reflectively measured latent variables (Jarvis, MacKenzie and Podsakoff, 2003) and prevents the issue of under- identification that may happen with the use of co-variance-based analysis technique (e.g. LISREL) (Bollen, 2014).

In this current research, the SEM is used to investigate the impact of ten factors, including: social influence, trust, and relative advantages of citizens' intentions to use egov services in Saudi as well as the moderating role of the cultural dimension of uncertainty avoidance. In accordance with Schreiber *et al.* (2006), SEM statistics must be presented in two main phases, before the examination and after the examination. Exploratory factor analysis (EFA) is the preferable data-screening process to be employed before conducting SEM statistical examination (Kline, 2011).

The validity of the measurement model is evaluated through considering both the discriminant as well as convergent validations. Discriminant validation assumes that the constructs should not be similar to other associated constructs; every couple of constructs is examined individually (Hair *et al.*, 2013; Tanaka, 1987; Tarling, 2008). Convergent validation describes the degree of interrelatedness among indicators of the similar construct, which must be relevant to reality (Domino and Domino, 2006; Reis and Judd, 2014). "Average Variance Extracted" (AVE) is employed to evaluate both discriminant and convergent validations (Dalgaard, 2008; Fornell and Larcker, 1981b). AVE describes the whole amount of variance in the indicators tallied via a latent variable (Schall and Smith, 2000). Convergent validation is sufficient when AVE \geq 0.50 and discriminant validation occurs when the AVE figures are higher than the squared interconstruct correlation (SIC) (Dalgaard, 2008). Additionally, composite reliability (CR) confirms the validation of the constructs, indicating how error impacts the scale (Field, 2013). A CR index of 0.70 is considered satisfactory (Hair (1998).

4.9 Fuzzy-set Qualitative Comparative Analysis (fsQCA)

Fuzzy-set qualitative comparative analysis (fsQCA) is an analysis approach that offers a substitute for the regression-based technique. Complicated casual patterns between a model's variables are explored by investigating fewer sets of cases. This method investigate all feasible interactions among a model's variables using casual configuration rather than exploring the way they influence the outcome. Thus, similar outcomes can be generated from different mixes of the models' variables. Results can be obtained from the presence or absence of a particular causal relationship based on context and the possible mix with other model's variables. According to Ragin (2014), contextual analysis of fsQCA produces diverse casual configurations as a result of comparing various cases. As the current study uses the Likert scale, three membership categories are identified according to Leischnig, Geigenmueller and Lohmann (2014). These categories are 5 for full membership, 1 for non-membership and 3 for maximum undetermined membership (Ragin, 2009b).

In fsQCA, a solution is selected based on two criteria, namely, consistency and coverage, which take a value between zero to one. According to Woodside (2013), consistency represents the degree of cover of the casual condition that the outcome produces. It is analogous to correlational statistics and is comprised of the sufficient of the solution's produced, whereas, coverage is analogous to the explained variance (R²). Therefore, for a solution to provide meaningful and interesting information, it is suggested that the related consistency should be higher than 0.75-0.80 and the related coverage between 0.25-0.65, with reasonably small variation. The last phase is to figure both the raw and the unique coverage. "Solution coverage" represent what is covered by a certain solution, the "raw coverage" represents the share outcome that is explained by a substitute path, whereas the "unique coverage" represents the share outcome that is solely explained by a particular substitute path. Complex, parsimonious and intermediate

are the solutions in fsQCA, in which the most detail is carried by the complex. The complex presumes that the outcome would not be achievable if the sample does not include real cases.

In second phase of the research analysis, fsQCA is applied for the identification of the patterns of factors to extend beyond the examination of the correlations of the model's variables. As a result of using fsQCA, fuzzy scale, which is continuous rather than dichotomous, could be used for both outcome and predictors' variables. The technique offers two types of configuration, necessity and sufficiency. They are classified in terms of three conditions, 'present,' 'absent' and 'do not care'. The differentiation between the core and peripheral elements are driven by the condition of necessity or sufficiency. According to Fiss (2011), significant casual condition toward the outcome is identified as the core element, whereas, an insignificant one is identified as peripheral.

To conduct fsQCA analysis, measures of the outcome and the independent variables need to be determined. Then, standardisation of all measures as fuzzy sets between 0 to 1 is needed to perform the analysis. 1 attributes to full-membership, whereas, 0 attributes to non-membership. This process of standardisation is conducted by the fsQCA software by configuring three informative thresholds, namely full-membership, non-membership and the crossover point, to explain the inclusion or the exclusion of the case from a set (Ragin, 2009b). This standardisation approach is suggested by Ordanini, Parasuraman and Rubera (2014). The three thresholds are placed on the 5 Likert scale. Full-membership, non-membership and the crossover point are set at the rate of 5, 3 and 1 respectively. After these anchors are set and the standardisation is completed, the software algorithm is ready to be applied to obtain 2 K of Rows, known as the truth table. K is attributed to the quantity of the outcome predictors and each row includes each potential set. According to Ragin (2009b), the truth table requires to be filtered on the

basis of the consistency and frequency of the observations. Fiss (2011, p.402) described the frequency as the observations' quantity for each potential set, whereas the consistency is the extent to which cases correlate with the set-theoretic relations articulated in a solution. To achieve the minimal quantity of empirical observations regarding the evaluation of the subset relations, a limit point is fixed. A limit of 1 is suitable for small or medium samples, whereas a limit of more than 1 is suggested for a sample that equal or more than 150 cases (Ragin, 2009b). Furthermore, Ragin (2009b) suggested that the minimum value of consistency of observations is fixed to N 0.85 which is greater than the suggested threshold of 0.78. For the lowest satisfactory frequency of observations frequency, Fiss (2011) recommended that it be fixed at 3.

4.10 Ethical Consideration:

The terms of privacy are presented for the approval and consent of the participants at the beginning of the survey. They are told that the data will be used in academic research and analysis and that stored data will remain anonymous. Respondents are also told that involvement is voluntary and that they are free to retreat whenever they want. Subsequent completion of the survey will be considered as consent to data being used in the study analysis. The Faculty of Research Ethics Committee has approved the ethical standards of the project and is fully satisfied that it conforms to academic ethical criteria for studies involving human participation.

4.11 Conclusion

The current chapter justifies the quantitatively conducted research and its analysis research proposed. If hypothesised relationships can be tested, the questions posed by the research can be answered. The measurement scales of each variable are identified, in accordance with well-known and previously validated scales. A questionnaire survey will be employed to gather the quantitative data from KSA citizens. A self-selected sampling technique is used to select the respondents among the population. Lastly, there is an explanation of the translations, the piloting test and the techniques adopted to analyse data statistically. The next chapter includes a discussion of the data analysis and the subsequent results.

CHAPTER FIVE

DATA ANALYSIS AND FINDINGS

5.1 Introduction

The preceding chapter presented the research methodology that was adopted and the design of the research, including the philosophical stance, the approach to the study, the method, research strategy, the design of the questionnaire and its piloting. Ethical and privacy issue were discussed, as were the concepts underpinning the quantitative methods; the questionnaire and surveys; and the size and techniques of sampling. "Structural equation modelling"(SEM), fuzzy set Qualitative Comparative Analysis (fsQCA), and the procedure used for the quantitative analysis were explained, and the validity and reliability of the tools were considered.

To fulfil the third aim of the research, i.e., to utilise "a methodological design, method and analytical technique that help answering research questions and help evaluating and validating the proposed model in the context of KSA and identify other alternative recipes to that model", the current chapter covers detailed statistical approaches and introduces the results of the analysis of data gathered from the survey in KSA.

It begins with an analysis of the ways in which the data was prepared, coded, cleaned and screened. There is then an evaluation of non-response bias, data normality, common method bias, data descriptive statistics and sample size, followed by an evaluation of two kinds, SEM and fsQCA. SEM evaluates the outer and the inner model, using "WarpPLS". The outer model assesses the reliability of individual items, convergent and discriminant validity, and full collinearity, while the inner model evaluates the hypothesised paths, their effects and their moderation. Lastly, the configuration approach, using fuzzy set Qualitative Comparative Analysis (fsQCA) and

its results are presented, including the necessity analysis and the intermediate solutions for the achievement of a high level of e-gov adoption.

5.2 Preparing Research Data and Collecting Procedure

Several obstacles were encountered in the gathering of the research data. Some of the targeted participants were reluctant to take part because of limited time or lack of interest, or because they were uneasy over the privacy aspect, even after the safeguards had been explained. One thousand questionnaires were spread and 690 completed questionnaires were exchanged. The returned questionnaires were checked for their compatibility with analysis and, after screening, 630 were found to be successfully completed and so qualified for analysis. The results indicated a 63% response rate.

5.3 Pre-analysis Data Processing

When data gathering is completed, it is crucial to examine the data by converting them to a form that is suitable for accurate analysis.

• Data Coding

Kothari (2004, p.123) described data coding as the allocation of numeric or symbolic figures to each response to help in their classification. Computer analysis software dealt with these responses and allocated them to appropriate categories (Saunders, Lewis and Thornhill, 2012). In this study, the continuous response scale employed a pre-coded approach through appointing a scale of numeric values to each question, with the number 1 signifying 'strongly disagree' and 5 signifying 'strongly agree'. SPSS was employed to help in coding and labelling the data gathered for each construct.

• Data Cleaning and Screening

The collected data was screened for coding mistakes and missing material in preparation for more complex analysis. It wass crucial to validate the correctness of the data used and to confirm that the causal relationships could be examined in accordance with the theories. Descriptive statistics and frequency tables were generated with SPSS statistical software to help in identifying missing values and inconsistancies in the survey answers (Saunders, Lewis and Thornhill, 2012). Missing values were then investigated. Dong and Peng (2013) state that missing values can occur at two stages, the unit stage and the item stage. Missing unit stage values occur when a participant is unable or reluctant to participate. Missing item stage values occur when one or more answers are missing from the questionnaire: these can be attributed to two main reasons. Participants might be unable to respond to questions in the survey due to lack of information or because they are unwilling to disclose private information. Alternatively, they may have missed out questions by accident or because of time limits for the completion of the survey (Saunders, Lewis and Thornhill, 2012).

Saunders, Lewis and Thornhill (2012), state that there are three types of missing data. The first is Missing Completely at Random (MCAR) which usually happens if the missing data of a particular item does not correspond to the specified item or any other items of interest. The second is Missing at Random (MAR) which usually happens if the missing data of a particular item does not correspond to the specified item but corresponds with another item of interest. The last type is Missing not at Random (NMAR) which usually happens if the missing data of a particular item soft interest. The last type is Missing not at Random (NMAR) which usually happens if the missing data of a particular item soft interest. The last type is Missing not at Random (NMAR) which usually happens if the missing data of a particular item corresponds to the specified item as well as other items of interest. Therefore, it is important for the current research to identify the missing data issue in order to rectify wrong conclusions in respect to the data analysis and its results. Furthermore, if generalisation of the

findings is the aim of the study, compromising the internal validity could lead to diminished statistical power or external invalidity.

According to Dong and Peng (2013), several techniques can be employed to overcome the issue of missing values in the research data. One is list wise deletion, which requires the researcher to completely remove the entire record when one or more values are missed. The second one is means substitution, in which it is required to find the mean from the whole data record in respect to that item and to replace the missing with the mean. There is also Multiple Imputation technique (MI) which imputes the missing values m times to generate a whole m data set, after which this set is analysed and the results combined. Another is Full Information Maximum-Likelihood (FIML) which is unlike imputation technique and uses estimation of the values, based on the available information included in the uncompleted data. The Expectation Maximisation (EM) Algorithm technique is similar to FIML, as there is no filling of the missed data. Instead, this technique uses an estimation of the value through the maximisation of the entire data log likelihood function. In the current research, the missing values are identified before any statistical analysis. Out of 690 responses, 30 were missing. On average, this accounts for approximately 4% of all responses. The acceptable percentage of missing values is still a controversial issue. Some scholars agree that 10% is a satisfactory percentage (Schlomer, Bauman and Card, 2010) and Hair et al. (2016) suggest 15%. In the present survey, a list wise deletion technique was adopted and 30 forms were excluded from the analysis.

• Assessing Non-response Bias

It is crucial to address the non-response bias, particularly since the current research has a percentage response rate of 63%. The occurrence of bias can be attributed to the refusal of participants to contribute to the questionnaire. The validity and the quality of a sample can be underestimated as a result of exposure to the non-response

bias and this is considered a significant issue (Lindner, Murphy and Briers, 2001). The evaluation of the non-response bias is achieved by a comparison of early and late responses. Lindner, Murphy and Briers (2001) state that this is a technique common employed for the identification of non-response bias in quantitative studies. They recommend that when there is no considerable difference between the two groups, generalisation of the findings to the whole population is permissible.

In the current research, the first 90 participants were identified as early participants as they responded quickly and effortless, whereas the last 90 were identified as late participants as their questionnaires took longer to obtain. However, there is no unanimity with regard to the quantity of items that need to be examined. Lambert and Harrington (1990) selected 28 items out of 56. In another study conducted by Yaghi (2007), the selected number of random items is 20 out of 74. In Kaleka (2012), thirty three items were chosen randomly. The acquired results, (see Appendix B), show that Levene's value is greater than 0.05, and it can therefore be supposed that similar variances are shared by the two groups compared. Furthermore, t-values (Sig 2-tailed) indicate that there is no strong variation when both groups are compared as "p-values more than 0.05" for nearly all the items tested. Thus, the conclusion is that the two compared samples represent the population. However, these findings do not exclude the possibility that the nonresponse bias does not exist. Instead the result indicated that it is not a major issue.

• Normality Test

It is crucial to assess normality as a precondition for analysing the data, especially when a multivariate analysis technique has been adopted, as is the case with the current research. Based on Field (2009, p.134), the assumption of normality is that the distributions of both independent variables as well as the targeted sample are normal. The entirety of values associated with a variable's indicator need to have a normal distribution, and this needs to be applied separately to all other indicators associated with all variables. According to Tabachnick and Fidell (2013a), studies that analyse their data using the regression statistical technique need to perform a normality test, as the data that has no normal distribution can affect the power of the statistically conducted research. In addition, false findings can result from an undermining of the efficacy of standard errors.

Normality assessment can be addressed by using a transforming mathematical approach, such as square root, logarithm and inverse. Graphically, normality can be evaluated by looking at the deviance, either in a visualised histogram or a visualised plot, or it can be statistically evaluated by looking at the values of skewness and kurtosis (Tabachnick and Fidell, 2013a). Skewness describes the degree of symmetry of the tested data, whereas kurtosis describes the extent to which the shape of the tested data is flattened or peaked (Tabachnick and Fidell, 2013a). Tabachnick and Fidell (2013a, p.79) state that when an item is skewed, its mean is not centred. It can be positively or negatively signed. The occurrence of the former is a result of the long tail being placed in the positive area, as opposed to the negative area of the peak, and the occurrence of the latter is a result of the long tail being in the negative area of the peak. However, the occurrence of positively signed kurtosis is a result of a value higher than zero, indicating that the peak is high and the tails are weighty. The negatively signed kurtosis results from its value being lower than zero, its peak is flattened and its tail is light. If the values of skewness and kurtosis are both zero, the data is normally distributed (Tabachnick and Fidell, 2013a).

However, there is no consensus in respect to the interpretation of the figures that represent the skewness and the kurtosis of the distribution. Prior studies in the literature have contended that any skewness figure that is higher than three is extremely skewed (Kline, 1993). According to Kline (1998) and Hoyle (1995), a kurtosis figure that is higher than ten is considered to be an issue, while a kurtosis figure that is greater than 20
is considered to be an extreme issue. In the current study, the distributions of all items are tested by an assessment of skewness and kurtosis, as illustrated in Table 5.1. It can be seen that each item has an index that represents a normal distribution of data, and that the skewness and kurtosis range from -1.831 and - 1.290, respectively, while the highest were 0.882 and 2.393 respectively. Despite the results in the table, "WarpPLS" is nonparametric in nature (Hair *et al.*, 2016; Sarstedt and Mooi, 2019), and consequently, it does not require data to be normally distributed. Therefore, analysts need to derive distributed data from the bootstrapping, which is in turn used to test significance.

construct	Items	Mean	Standard deviation	skewness	kurtosis	Construct	Items	Mean	Standard deviation	skewness	kurtosis
TRUG	TRUG1	4.049	0.848	-0.534	-0.583	RELT	RELT4	4.254	0.794	-0.482	-1.485
	TRUG2	3.784	1.049	-0.659	0.159		RELT5	3.849	0.930	-0.594	-0.849
	TRUG3	4.234	0.843	0.708	-1.340		RELT6	3.840	0.7748	-0.134	-1.483
TRUT	TRUT1	4.383	0.834	-1.045	-0.390	COMP	COMP1	4.490	1.032	-1.149	-1.453
	TRUT2	4.495	0.794	-0.459	-0.353		COMP2	3.593	0.839	-0.148	-0.594
	TRUT3	4.245	0.895	0.453	-0.145		COMP3	3.493	0.793	-0.340	-1.234
	TRUT4	3.489	0.784	-0.584	-0.402		COMP4	4.390	0.673	-0.283	-0.883
TRUW	TRUW1	4.392	1.493	-0.252	-1.434	COML	COML1	4.049	0.849	-0.589	-0.487
	TRUW2	3.893	0.893	-0.157	-1.093		COML2	4.340	0.749	-0.489	-1.483
	TRUW3	4.245	1.434	-1.450	-0.058		COML3	3.281	0.803	-0.843	-0.478
EOU	EOU1	4.459	0.938	-0.930	0.394	SOCL	SOCL1	3.938	1.184	-0.384	-0.478
	EOU2	3.404	1.493	-0.584	-0.134		SOCL2	4.932	0.849	-0.392	-0.394
	EOU3	3.483	0.784	-0.439	-1.434		SOCL3	3.291	0.849	-0.283	-0.293
	EOU4	3.349	0.748	-1.490	-0.150		SOCL4	3.201	0.784	-1.023	-0.192
	EOU5	2.938	0.943	-0.481	0.583	INTN	INTN1	4.378	0.878	-0.403	-1.283
USF	USF1	3.83	0.690	0.138	-1.859		INTN2	3.483	0.795	-0.689	-0.583
	USF2	3.594	0.849	-0.158	-0.594		INTN3	4.489	0.840	-0.509	-0.158
	USF3	4.245	0.738	0.684	-0.359		INTN4	3.902	0.800	-0.273	-0.795
	USF4	4.853	0.790	-0.589	-0.594	UNCT	UNCT1	4.381	0.839	-0.485	-1.473
RELT	RELT1	3.334	0.839	-0.289	0.348		UNCT2	3.904	0.794	-0.594	-0.483
	RELT2	4.038	0.937	-0.148	-0.483		UNCT3	4.382	0.739	-0.484	-0.293
	RELT3	4.048	0.743	-0.390	0.193						

Table 5.1 Descriptive statistics and normality tests of the constructs in the model.

Notes:

TRUG: Trust toward government; **TRUT**: Trust toward technology; **TRUW**: Trust toward webpage; **EOU**: Perceived ease of use; **USF**: Perceived usefulness; **RELT**: Relative advantages; **COMP**: Compatibility; **COML**: Complexity; **SOCL**: Social influence; **INTN**: Intention to use e-gov services; **UNCT**: Uncertainty avoidance.

• Common Method Bias

The assumption of the common method bias is that most of the variance is explained by an individual factor. The investigators usually depend on the same participants to supply data with respect to the constructs that are investigated (Podsakoff, MacKenzie and Podsakoff, 2012). The validity of the measures can be negatively affected by the common method bias as the prime cause of measurement error (Podsakoff, MacKenzie and Podsakoff, 2012). Furthermore, inflation can occur in the correlation as a result of that bias (Meade, Watson and Kroustalis, 2007).

As all variables, (that is, intention to use e-gov services, trust toward government, trust toward technology, trust toward webpage, perceived usefulness, perceived ease of use, compatibility, complexity, relative advantages, social influence and culture) are measured through utilising a single method "survey", the method used in the current research needed to be tested. Accordingly, Harman's one-factor test was used to assess common method bias (Podsakoff, MacKenzie and Podsakoff, 2012). As illustrated (see Appendix C), the un-rotated factor analysis demonstrated that 29.35% of the whole variance is covered by the first factor. It was concluded that there is no common variable to hinder any future analysis of the data, since no percentage exceeded 50 percent (Podsakoff, MacKenzie and Podsakoff, 2012).

• Descriptive Statistics

A total of 630 participants were found suitable for analysis: 347 men and 283 women. These numbers accounted respectively for 55% and 45%. The highest number of experience / years among participants was two to five, which accounted for 46%. The majority of participants have Bachelor's degree which accounted for 49.0%. The following table (Table 5.2), displays demographic details of the participants.

Category		
Total subjects		630
Gender	Males	347 (55%)
	Females	283 (45%)
	Bachelor	309 (49%)
Education level	Diploma	132 (21%)
	Master or PhD	189 (30%)
	Other	-
	< 2	201 (32%)
Internet experience	2<5	290 (46%)
	>5	139 (22%)
	<25	158 (25%)
Age	25<30	233 (37%)
	31<40	145 (23%)
	41<50	94 (15%)
	>50	
	<1000	328 (52%)
	1000-2000	107 (17%)
Income	2000-3000	100 (16%)
	3000-4000	95 (15%)
	>4000	-

Table 5.2 Sample Profile

5.4 Sample Size

It is crucial to have an appropriate sample size if the results are to be reliable and representative. Usually, the bigger the sample, the more reliable and more accurate the results will be. However, defining a large sample is still a controversial issue in the literature. According to Hair et al. (2016), to estimate an adequate sample size, either the highest number of items that formatively measure a construct or the highest number of arrows pointing to a construct, is multiplied by ten. The number produced from this mathematical process can be considered an adequate sample size for the analysis. Another method of calculating the sample size is known as the ratio. This method, as its name indicates, has at least five or ten observations per construct (Hair et al., 2016). Another simpered formula suggested by Smith (2013) to calculate the sample size of either large unknown population size. This formula as follow: or

$$n = \frac{(Z \ Value)^2 \times StdDev \ \times (1 - StdDev)}{(margin \ of \ error)^2}$$

Where:

- (n) is the required sample size
- (Z Value) is selected based on the Z table where each confident interval level is linked to a particular Z score. Commonly, %90, %95 or %99 is chosen (Smith, 2013).
- (StdDev) is the standard deviation which inform researchers the variation on the data from the sample. Commonly, 0.5 is used.
- (margin error) is the statistical degree of uncertainty and the size of error is permitted. Frequently, either +/- %5 or +/-%3 is accepted (Smith, 2013).

If this equation is applied = $\frac{(1.69)^2 \times .5 \times (1-.5)}{(.05)^2}$, the suggested sample size will be

384.16 which can be mathematically rounded to 384.

One of most common ways of estimating the sample size is by utilising a program called GPower. For an estimation of the sample size through GPower, it is necessary to identify the type of test and the statistic's group of the test. Then the type of power analysis needs to be selected. Here, for the purpose of estimating the sample, the chosen type of power analysis is "prior". Finally, it is also important to identify criteria such as the effect-size, alpha-level and the required level of power. Figure 5.1 illustrates the parameters selected in the program in order to estimate an acceptable sample size. For the purpose of this study, conservative selections were chosen, the effect-size and the alpha-level size are 0.15, and 0.95 were selected as the power of the analysis. As a result, the program suggested that an adequate sample size for this study is 146 respondents. After the collection of the data, another test is conducted with Gpower software to check whether the sample size is adequate for the statistical power that is required for the research. Changes to the software input were made by changing the value "prior" in the type of power analysis and putting the actual and usable sample size in the 'Total sample size' field which is 630 participants. The results showed that the actual sample size had

a strong statistical power of (Power 1-B err prob =1.0000000) and effect size of (0.15). In general, all previous techniques of determining sample size confirm that the sample size of this research is satisfactory. Figure 5.1 and Figure 5.2 respectively show the prior sample selection and the post hoc sample size check.



Figure 5.16 Priori sample selection



Figure 5.17 Post hoc Sample Size Check

5.5 "Structural Equation Modelling"

Two generations are usually used to analyse data. The first of these is used to conduct a correlation test between variables, a regression test and also a mean test. However, Lowry and Gaskin (2014) considered this generation as a limited one, especially when the researcher needs to analyse a complex model with many variables, which might also include mediation. The other generation is a more advanced technique called Structure Equation Modelling (SEM). SEM is a system that employs a confirmative technique, "test hypotheses", in analysing the structure of a theory that affects a phenomenon (Byrne, 2013, p.3). The aim of SEM is to explain the links between two or more constructs by utilising a concatenation of multiple regression mathematical equations. In this context, theories play an essential role. According to Hair *et al.* (2016) theories are the prime definers of the conceptual model relations between variables and are the foundation of hypotheses that correctly explain the casual relations between the studied variables. SEM processes convey that the causative relations between the studied variables are appointed through multiple regressions, permitting all the variables that

shape the proposed model to be analysed simultaneously and for its consistency to be determined (Byrne, 2013).

SEM consists of two further techniques, a covariance-based-SEM technique known as CB-SEM, and a Partial-Least-Squares-SEM technique, known as PLS-SEM. Each of these techniques has its own features, and these need to be considered in order to fit the researcher's criteria for the analysis. According to Hair et al. (2016), CB-SEM is usually suitable for a researcher who wants to confirm a theory or to compare between two or more theories. However, it requires a large sample size if it is to work properly. The data needs to be normally distributed, with a minimum of three indicators for each variable. PLS-SEM is a non-parametric technique and is more suitable for a researcher who wants to conduct an exploratory study or to extend a theory that already exists in the literature. It is more suitable for predictions or for the detection of salient factors that affect a certain phenomenon. It is also more flexible with regards to sample size and data normality, and so it is suitable for working with small samples and with data that is not normally distributed. Furthermore, it has the ability to work with variables that are measured with one or more indicators. PLS-SEM was selected as being more appropriate to the aim of this study, which is to find the catalytic factors that affect the adoption of e-gov from a citizens' perspective. Table 5.3 below shows a synopsis of the differences between the two techniques.

SEM techniques							
Criteria	"Partial Least Squares"	Covariance-Based (CB)					
	(PLS)						
Data distribution	Relaxed, does not assume	Data need to be normally					
	that data are normally	distributed					
	distributed						
Missing Data	It has the ability to deal	Missing data need to be					
	with missing data.	solved before conducting					
	However, the missing data	the analysis and should be					
	should be in accordance	according to the					
	with the recommended	recommended level					
	level						

Table 5.3 SEM Techniques Comparison

Indicators/Variables	It has the ability to deal	It can deal with a variable
	with a variable that has	that has a minimum of
	one or more indicators.	three indicators
Model characteristics	Complex model	Simple model
Aims	It is more suitable for	The aim of the study
	predictions, identifying	is to confirm theories or to
	salient factors, exploratory	compare them
	studies and extending an	
	existing theory.	

According to Hair (2013, p.549), a model can be described as a series of links that are systematically set to help in presenting an inclusive understanding and demonstration of a certain phenomenon. The visualisation of theories investigated through the SEM model in the form of path diagrams helps to make the model more understandable (Byrne, 2013). Two categories of variable are presented in SEM modelling, latent variables and observed variables. According to Kline (2011), the former are those that cannot be measured straightforwardly and require one or more sets of items to measure them, whereas the latter are those items that indirectly measure the former (Kline, 2011).

The superannuated generation with regard to multivariate procedure is divided into two categories, the interdependence technique and the dependence technique, whereas "Structural Equation Modelling" combines both techniques. "Structural Equation Modelling" relies on analysing approaches, factors and multiple regressions (Hair *et al.*, 2016). It is further divided into sub-models, an inner model the "structural model," and an outer model, the "measurements model."

5.5.1 The Outer Model

According to Hair *et al.* (2016), the outer model refers to the identification and description of the measurement theories that illustrate the ways in which that construct is operationalised by one or more measured items or indicators. The outer model specifies the links between each construct or unobserved variable and its observed

variables or indicators to measure that construct through binding them together (Byrne, 2013). To statistically analyse the link between construct and its indicators, a technique called factor analysis is usually employed. The outer model is used to assess individual item reliability, construct reliability and convergent validity, which helps to discern whether measures are internally consistent.

• Individual Item Reliability

Both cross loadings and combined loadings are used to assess the individual item reliability in the current study. The latter are obtained through the unrotated structure matrix, which also provides Pearson correlations of the unobserved constructs with the items that measure them. The cross loadings are obtained through the rotated pattern matrix, which includes 43 indicators. Each group of indicators is loaded successfully to the unobserved construct to which it is appointed. According to Kock (2013), the resulting figures usually range from 1 to -1. Hair *et al.* (2013) suggest that the loading values need to be equal to, or higher than, 0.50, whereas, p-value in respect to those loadings needs to be less than 0.05. It can be noticed clearly from Table 5.4 below that the unobserved variables and how their appointed indicators loaded. It also illustrates that the indicators' loadings' values are greater than the values they shared with other unobserved constructs. In addition, the indicators' loadings' values are greater than 0.50 (p < 0.001). Overall, and on the basis pf recommendations in the literature, the current results imply that the measurement items are acceptable and individually reliable.

Table 5.4 Loadings and cross-loadings for latent variables

Items	TRUG	TRUT	TRUW	EOU	USF	RELT	COMP	COML	SOCL	INTN	UNCT	P value
TRUG1	0.873	0.372	0.003	0.283	0.016	0.029	0.417	0.349	0.291	0.384	0.048	< 0.001
TRUG2	0.830	0.039	0.271	0.483	0.005	0.372	0.053	0.374	0.473	0.403	0.367	< 0.001
TRUG3	0.848	0.127	0.289	0.411	0.372	0.120	0.416	0.473	0.032	0.182	0.439	< 0.001
TRUT1	0.238	0.782	0.029	0.221	0.392	0.317	0.217	0.291	0.403	0.437	0.471	< 0.001
TRUT2	0.399	0.802	0.128	0.627	0.128	0.162	0.065	0.310	0.273	0.218	0.201	< 0.001
TRUT3	0.230	0.837	0.239	0.029	0.231	0.471	0.043	0.039	0.394	0.473	0.483	< 0.001
TRUT4	0.103	0.892	0.006	0.382	0.278	0.017	0.054	0.343	0.394	0.322	0.319	< 0.001
TRUW1	0.483	0.290	0.904	0.287	0.021	0.370	0.541	0.120	0.029	0.293	0.182	< 0.001
TRUW2	0.039	0.103	0.847	0.382	0.267	0.182	0.047	0.382	0.123	0.403	0.029	< 0.001
TRUW3	0.320	0.393	0.783	0.037	0.289	0.471	0.281	0.127	0.473	0.347	0.372	< 0.001
EOU1	0.012	0.383	0.238	0.803	0.308	0.128	0.037	0.192	0.032	0.039	0.389	< 0.001
EOU2	0.039	0.039	0.337	0.918	0.043	0.217	0.127	0.093	0.372	0.283	0.192	< 0.001
EOU3	0.073	0.482	0.138	0.792	0.382	0.612	0.026	0.384	0.049	0.342	0.130	< 0.001
EOU4	0.211	0.218	0.237	0.739	0.392	0.278	0.127	0.039	0.384	0.340	0.029	< 0.001
EOU5	0.038	0.127	0.373	0.793	0.029	0.170	0.028	0.378	0.083	0.127	0.218	< 0.001
USF1	0.302	0.023	0.137	0.382	0.793	0.002	0.128	0.473	0.283	0.038	0.238	< 0.001
USF2	0.392	0.003	0.127	0.391	0.843	0.291	0.037	0.182	0.473	0.472	0.038	< 0.001
USF3	0.301	0.371	0.233	0.182	0.917	0.006	0.128	0.129	0.389	0.342	0.392	< 0.001
USF4	0.182	0.203	0.221	0.120	0.827	0.028	0.037	0.374	0.128	0.483	0.028	< 0.001
RELT1	0.281	0.127	0.291	0.290	0.121	0.793	0.128	0.384	0.483	0.273	0.029	< 0.001
RELT2	0.236	0.029	0.283	0.186	0.119	0.730	0.037	0.219	0.009	0.128	0.384	< 0.001
RELT3	0.128	0.372	0.372	0.428	0.273	0.927	0.006	0.328	0.289	0.039	0.028	< 0.001
RELT4	0.374	0.028	0.382	0.373	0.482	0.763	0.329	0.248	0.283	0.472	0.023	< 0.001
RELT5	0.318	0.039	0.237	0.039	0.220	0.836	0.428	0.182	0.483	0.374	0.127	< 0.001
RELT6	0.086	0.128	0.472	0.382	0.137	0.863	0.146	0.319	0.180	0.378	0.239	< 0.001
COMP1	0.079	0.029	0.238	0.238	0.439	0.291	0.892	0.210	0.329	0.238	0.003	< 0.001
COMP2	0.378	0.374	0.273	0.128	0.229	0.216	0.704	0.328	0.182	0.347	0.023	< 0.001
COMP3	0.034	0.384	0.371	0.293	0.129	0.102	0.847	0.498	0.329	0.129	0.238	< 0.001
COMP4	0.490	0.128	0.620	0.372	0.452	0.163	0.795	0.389	0.219	0.102	0.007	< 0.001
COML1	0.039	0.023	0.002	0.120	0.382	0.372	0.039	0.798	0.418	0.293	0.029	< 0.001
COML2	0.002	0.362	0.329	0.203	0.362	0.218	0.238	0.748	0.330	0.239	0.129	< 0.001
COML3	0.382	0.120	0.371	0.471	0.238	0.219	0.384	0.838	0.239	0.304	0.483	< 0.001
SOCL1	0.003	0.129	0.483	0.129	0.237	0.218	0.047	0.192	0.828	0.283	0.239	< 0.001
SOCL2	0.039	0.417	0.284	0.212	0.039	0.392	0.038	0.384	0.793	0.330	0.007	< 0.001
SOCL3	0.239	0.128	0.291	0.029	0.032	0.229	0.128	0.483	0.738	0.103	0.394	< 0.001
SOCL4	0.032	0.180	0.009	0.238	0.382	0.120	0.281	0.093	0.931	0.339	0.039	< 0.001
INTN1	0.237	0.271	0.203	0.391	0.018	0.498	0.382	0.483	0.039	0.829	0.323	< 0.001
INTN2	0.238	0.281	0.392	0.019	0.117	0.229	0.195	0.239	0.482	0.795	0.239	< 0.001
INTN3	0.283	0.218	0.283	0.283	0.632	0.192	0.348	0.348	0.094	0.849	0.483	< 0.001
INTN4	0.364	0.483	0.478	0.485	0.238	0.410	0.387	0.701	0.378	0.827	0.473	< 0.001
UNCT1	0.489	0.039	0.640	0.192	0.483	0.392	0.218	0.283	0.007	0.483	0.837	< 0.001

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UNCT2	0.398	0.481	0.407	0.340	0.485	0.382	0.217	0.492	0.039	0.589	0.903	< 0.001
UNCT3	0.093	0.039	0.478	0.378	0.384	0.410	0.381	0.128	0.283	0.128	0.736	< 0.001

Notes:

TRUG: Trust toward government; TRUT: Trust toward technology; TRUW: Trust toward webpage; EOU: Perceived ease of use; USF: Perceived usefulness; RELT: Relative advantages; COMP: Compatibility; COML: Complexity; SOCL: Social influence; INTN: Intention to use e-gov services; UNCT: Uncertainty avoidance.

• Reliability Assessment

As formerly disscussed, reliability usually describes the degree to which identical results are produced by the measures utilised in distinct events. Various technques can be employed to evaluate reliability. One of these is the eveluation of the internal consistancy, which is a group of indicators that reflectively measure unobserved variables. Colton and Covert (2015) state that, by doing so, investigators are able to perform a comparison of the results obtained among those indicators within the bounds of an individual instrument. One of the measures widely used to assess reliability is Cronbach's alpha coefficient (Ketchen, Ireland and Snow, 2007). In Structural Equation Modelling, reliability is also evaluated through utilising "constructs" or "composite reliability (CR)". This technique also helps to address the internal consistency of the suggested criteria, Cronbach's alpha coefficient and composite reliability (CR) need to be at least equal to, or higher than, 0.7 for internal reliability to be achieved (de Vaus, 2002). It is evident from Table 5.5 below that both of these techniques for the measurement of reliability are either equal to, or higher than 0.7, thus, internal consistency is confirmed.

Factors	Cronbach's alpha coefficients	Composite reliability coefficients
TRUG	0.836	0.903
TRUT	0.879	0.893
TRUW	0.901	0.939
EOU	0.911	0.920
USF	0.893	0.911
RELT	0.878	0.898
COMP	0.899	0.923
COML	0.867	0.901
SOCL	0.782	0.899
INTN	0.899	0.941
UNCT	0.782	0.870

Table 5.5 Reliability Assessment

• Validity Evaluation - Convergent Validity

Colton and Covert (2015) describe validity as the scope to which an instrument is able to scale what it is appointed to scale. Here, convergent validity is the degree to which indicators successfully converge on an individual unobserved variable (Ketchen, Ireland and Snow, 2007). In the current research, the "Average Variance Extracted" (AVE) is assessed. An AVE is appointed to the mean variance that is taken from the items' loadings of the unobserved variables (Hair *et al.*, 2013). The AVE of each construct needs to be higher than 0.5. Table 5.6 illustrates the AVE of each unobserved variable. The value of each AVE is higher than 0.5. Accordingly, the convergent validity is confirmed in terms of the recommendations in the literature.

Table 5.6 Average Variances Extracted

Factors	TRUG	TRUT	TRUW	EOU	USF	RELT	COMP	COML	SOCL
AVE	0.548	0.740	0.573	0.638	0.543	0.594	0.612	0.649	0.559
Factors	INTN	UNCT							
AVE	0.596	0.506							

• Validity Evaluation - Discriminant Validity

According to Hair *et al.* (2013), discriminant validity can be described as the degree to which each variable is different to other variables. It can be confirmed when a significant correlation between variable does not exist (Colton and Covert, 2015). Such an assessment can be conducted by evaluating the square root of the AVE. It should be higher than the correlation among the investigated variables (Fornell and Larcker, 1981a). When the AVE of an individual variable is found to be higher than the shared variance, which refers to the variance that is explained by one variable to another variable, the discriminant validity is confirmed. The below table (Table 5.7) demonstrates the outcoms of the squared root of the AVE. It can be seen that they are high compared to the correlations between the variables (Fornell and Larcker, 1981a). The critiria of discrement validity is confirmed for all variables. In addition, the report of the

correlation matrix indicated that significant correlations exist between variables ($P \leq$

0.001).

Factors	TRUG	TRUT	TRUW	EOU	USF	RELT	COMP	COML	SOCL	INTN	UNCT
TRUG	(0.872)										
TRUT	0.738	(0.932)									
TRUW	0.289	0.448	(0.848)								
EOU	0.437	0.512	0.447	(0.843)							
USF	0.340	0.323	0.339	0.334	(0.802)						
RELT	0.423	0.403	0.439	0.489	0.443	(0.812)					
COMP	0.683	0.437	0.412	0.339	0.323	0.432	(0.788)				
COML	0.493	0.483	0.332	0.483	0.440	0.323	0.347	(0.849)			
SOCL	0.234	0.283	0.312	0.243	0.323	0.473	0.379	0.434	(0.788)		
INTN	0.437	0.443	0.129	0.449	0.349	0.334	0.249	0.403	0.334	(0.838)	
UNCT	0.273	0.234	0.363	0.232	0.234	0.487	0.529	0.637	0.402	0.390	(0.793)

Table 5.7 Correlation between Latent Variables and Square Roots of AVEs

Notes:

TRUG: Trust toward government; **TRUT**: Trust toward technology; **TRUW**: Trust toward webpage; **EOU**: Perceived ease of use; **USF**: Perceived usefulness; **RELT**: Relative advantages; **COMP**: Compatibility; **COML**: Complexity; **SOCL**: Social influence; **INTN**: Intention to use e-gov services; **UNCT**: Uncertainty avoidance.

• Full Collinearity VIFs and Q-squared Coefficients Evaluation

"WarpPLS" statistical software is employed because of its ability to measure the "Full Collinearity Variance Inflation Factors"" (VIFs) of all the unobserved variables that were investigated. According to Kock (2013), the aim is to evaluate the discriminant validation as well as the overall collinearity of those constructs. Evaluation of the VIFs is dependent on testing the full collinearity. The latter in turn helps to identify vertical as well as lateral collinearity. Kock (2013, p.13) states that the vertical collinearity refers to predictor to predictor unobserved variable collinearity in a single unobserved variable block, whereas, the Lateral indicates predictor to criterion unobserved variable collinearity. The results of this kind of collinearity could mislead the researcher (Kock, 2013, p.13). As suggested in the litrature, the full collinearity VIFs are required to be equal to, or less than, 3.3 to confirm that multicollinearity does not exist (Kock, 2013). The following table (Table 5.8) demonstrates that the value of each of the unobserved constructs investigated has full collinearity VIFs that are less than 3.3. Therefore, discriminant validity is confirmed for all of the unobserved constructs investigated and there is no effect of multicollinearity..

In addition to full collinearty VIFs, validiation of the model's endogenous unobserved constructs is assessed through the use of a Q-squared coefficient test. For a satisfactory predictive validity, the value of the Q-squared coefficient needs to be higher than 0.0. A value below 0.0 indicates that the predictive validity of the proposed model is weak (Hair *et al.*, 2013; José and Manuel, 2012). For the current research, the results show that all construct values of the Q-squared coefficient are higher than 0.0. Consequently, the model is confirmed as having predictive validity.

Factors	TRUG	TRUT	TRUW	EOU	USF	RELT	COMP	COML	SOCL
VIFs	3.127	2.567	3.344	2.039	3.218	3.134	2.334	3.192	2.367
Q-squared coefficients		0.542	0.601	0.616	0.583	0.437	0.493	0.375	0.705
Factors	INTN	UNCT							
VIFs	2.301	2.394							
0 1	0.4-6	0.000							

Table 5.8 Full Collinearity VIFs and Q-squared Coefficients Assessment

5.5.2 The Structural Model

According to Kock (2014), the structural model is simply the defined cause and effect links between the particular model's constructs. The objective of defining such cause and effect links is to help in testing the proposed hypothesis of the conceptual model under investigation. Usually, model fit indices are assessed through three tests, namely the Average Path Coefficient (APC); the Average R-squared (ARS); and the Average Variance Inflation Factor (AVIF) (Kock, 2014). The author suggested that the APC and the ARS are significant where P < 0.05, and the AVIF is less than 5. Table 5.9 below illustrates that all the previous indices satisfy the cited criteria, and thus the model fit is acceptable.

Table 5.9 Model Fit Indices

Indices	APC	ARS	AVIF
	0.172	0.739	2.184
Note: -*** = F	P<0.001		

5.5.3 Results Synopsis

Figure 5.3 shows the results of the Structual Equation Modelling (SEM) analysis of the curent study. All hypotheses are defined by connecting each construct with the other one. The unobserved constructs are defined with square shapes. The beta coefficients as well as the standarisation of the partial regression coefficients indicate the power of the multivariate associations between constructs in the defined model. One star indicates a degree of significance that is less than 5% where (P < 0.05); two stars indicate

1% where (P < 0.01); and three stars indicate 0.1% where (P < 0.001). NS refers to a relationship that is not significant. Finally, R-squared refers to the amount of variance that constructs appointed to that particular construct are able to explain.



Figure 5.18 Proposed Research Model

All the proposed hypotheses are examined through the structural model so that relationships between variables can be identified. Table 5.10 below includes a synopsis of the coeffecients after standardisation, which was obtained through the estimation of both the structural model and P value. Moreover, a simple structural model with the exclusion of measurements and the variance error for clarity is presented in Figure 5.3 above.

Hypothesised paths	Standardised	P value	Test results
	coefficient		
$TRUG \longrightarrow TRUW$	0.37	***	Accept
$TRUT \longrightarrow TRUW$	0.41	***	Accept
TRUW> INTN	0.19	*	Accept
$RELT \longrightarrow TRUW$	0.35	***	Accept
$RELT \longrightarrow INTN$	0.28	***	Accept
$EOU \longrightarrow USF$	0.69	***	Accept
$COMP \longrightarrow INTN$	0.49	***	Accept
$COML \longrightarrow INTN$	-0.71	***	Accept
EOU \longrightarrow TRUW	0.18	*	Accept
USF \longrightarrow INTN	0.08	NS	Reject
$SOCL \longrightarrow INTN$	0.56	***	Accept
$RELT \longrightarrow CUL \longrightarrow INTN$		***	Accept
$\bigcirc \text{COMP} \longrightarrow \text{CUL} \longrightarrow \text{INTN}$		***	Accept
$\bigcirc \text{COML} \longrightarrow \text{CUL} \longrightarrow \text{INTN}$		***	Accept

Table 5.10 Structural model estimation results

H1 is confirmed, with the construct of trust toward government positively affecting trust toward e-gov webpages (standardised coefficient= 0.37 at p<0.001) and thus H1 is accepted. H2 receives support, as the construct of trust toward technology positively relates to trust toward e-gov webpages (Standardised coefficient= 0.41 at p<0.001). H3 is well accepted, as the construct of trust toward e-gov methods positively impacts citizens' intentions to use e-gov systems (Standardised coefficient= 0.19 at p<0.05). Relative advantages positively relate to trust toward e-gov webpages (H4). This premise is supported (Standardised coefficient= 0.35 at p<0.001). H5 is supported, as relative advantages significantly impact citizens' intentions to use e-gov systems (Standardised coefficient= 0.28 at p<0.001). H6 predicted that compatibility positively impact user' intentions to adopt e-gov systems. The study confirms this prediction (Standardised coefficient= 0.49 at p<0.001). Hypothesis 7 proposed a positive association between complexity and citizens' intentions to use e-gov systems. As expected, complexity negatively affects citizens' intentions to use e-gov systems (Standardised coefficient= -0.71, P<0.001).

As expected, the H8, H9 and H10 results revealed that perceptions of ease of use, perceptions of usefulness, as well as social influence significantly impact individuals' intentions to use e-gov systems. The results additionally transpired that perceived ease

of use and social influence significantly affect citizens' intentions to use e-gov systems, ease of use standardised coefficient=0.18, P<0.05; social influence: standardised coefficient=0.56, P<0.001, while perceived usefulness has no impact on citizens' intentions to adopt e-gov systems.

5.5.4 Total Effects, Direct Effects, and Indirect Effects

The statistical software employed, ("WarpPLS") is capable of producing all types of effect for the investigated unobserved constructs in the model that connect to one or more links with other constructs in the same model. According to Kock (2012, p.50), the software also produces several important results with those effects, such as path coefficients linked to those effects and the quantity of paths that produce a particular effect. It also produces the P-value linked to each effect, which is normally measured by resampling, using the chosen resampling technique, standard error linked to the effect and finally the size of the effect. Cohen (2013) f-squared coefficient is followed to measure those effects.

Table 5.11 shows the total effect of users' intentions to use e-gov systems, along with the quantity of paths for measuring them, the size of the effects as well as the linked P-values. The sum of the effects is measured by considering all paths linking two constructs. The statistical software ("WarpPLS" 4.0) spontaneously measures the whole impact and the commensurate P-values (Kock, 2012). As seen in the table, the sum of the effects with regard to citizens' trust toward e-gov webpages is significant, as the P-value for citizens' intentions to use e-gov services equals = 0.02.

	Quantity of Path	Total-effect	P-value	Effect-size
TRUG	2	0.31	0.02	0.27
TRUT	2	0.26	< 0.001	0.21
TRUW	1	0.39	< 0.001	0.47
EOU	2	0.61	< 0.001	0.52
USF	1	0.20	< 0.001	0.29
REL	3	0.51	< 0.001	0.62
COMP	1	0.47	< 0.001	0.36
COML	1	0.38	< 0.001	0.57
SOCL	1	0.63	< 0.001	0.37

Table 5.11 Total Effect of individuals' intention to use e-gov services.

Table 5.12 below presents the direct effect of factors on citizens' intentions to adopt e-gov systems. It can be seen that some of these factors, e.g. trust toward e-gov webpages, relative advantages, complexity, compatibility and social influence, directly and significantly impact citizens' intentions to use e-gov webpages.

Table 5.12 The uncer effect								
	Paths N	Direct effect	P value					
TRUW	1	0.18	< 0.001					
USF	1	0.09	0.23					
REL	1	0.26	< 0.001					
COMP	1	0.43	< 0.001					
COML	1	0.58	< 0.001					
SOCL	1	0.51	< 0.001					

Table 5 12 The direct effect

Table 5.13 below shows the sum of the indirect effects of the factors on citizens' intentions to use e-gov systems. It also illustrates the coefficient of the total of the indirect impact of factors on citizens' intentions to use e-gov system = 0.793, which is significant at the P-value <0.001. The outcomes of the indirect impacts imply that a mediating role is played by trust toward e-gov webpages.

	Table 5.13 Sums of Indirect Effects						
	Paths-N Indirect effects P-value						
INT	5	0.793	< 0.001				

Table	5.13	Sums	of	Indirect	Effec

Notes: TRUG: Trust toward government; TRUT: Trust toward technology; TRUW: Trust toward webpage; EOU; Perceived ease of use; USF: Perceived usefulness; RELT: Relative advantages; COMP: Compatibility; COML: Complexity; SOCL: Social influence; INTN: Intention to use e-gov services.

5.5.5 Moderating Effects

According to Hair *et al.* (2016), it is essential to understand the type of moderator, as it can influence the significance of a particular link between model constructs. There are two types of moderators, categorical and continuous. The former is often gathered by utilising one item e.g. category data (male or female, married or single). The latter is often gathered by utilising two or more items for measurement. A moderating effect is performed by creating an interaction term in order to see its impact. Three methods commonly used to create such interaction terms are the product-indicator method, the orthogonalising method and the two stages method. For the product-indicator method, the indicator of each variable is multiplied by the indicator of each moderator. However, this method has drawbacks. When the variable has formative indicators, it could raise the issue of collinearity, as indicators of both variable and moderator are used again; and it can also increase the moderating impact (Hair *et al.*, 2016).

The orthogonalising method is an extended method whereby product-indicators avoid the shortcomings of the method previously mentioned. The main goal of this method is to remove collinearity. Two effects are generated from this method, a main effect and a simple effect. The former is the effect between model variables without the moderator interaction term, whereas the latter effect is with the moderator interaction term. The data used in the interaction term is standardised, and thus collinearity is removed. According to Hair *et al.* (2016) the use of this method is not advisable when the variable or the moderator has formative indicators. They recommend this method when the aim is to increase the prediction or reduce the bias of an interaction effect.

The two-stage method, as its name suggests, involves two phases. The first is the analysis of the model's paths without creating the moderator interaction terms. In the next phase, multiplication of the generated scores of both the variable and the moderator is performed to produce a single item measure. Unlike the previous methods, this one can be used irrespective of whether the variable has formative indicators or reflective indicators. It is recommended when the aim is to measure the significance of the effect of the moderator interaction term (Hair *et al.*, 2016).

However, there is an alternative approach that is often used to examine the moderation impact. It is referred to as multi-group analysis or group comparison technique (Byrne, 2016; Sharma, Borna and Stearns, 2009). This approach is particularly preferred when the independents of the moderator variables are discrete (Vinzi et al., 2010). Despite the risk of dichotomising the formatively measured constructs, this approach works well with reflectively measured constructs (Vinzi et al., 2010). The technique follows a split group method in which the main sample is subdivided into two groups according to an identified cut-off value of the moderating construct. In the current study, the sample is subdivided into high and low according to the moderator variable (uncertainty avoidance) cut-off point. The subdivision is performed according to the median of the variable uncertainty avoidance (Sharma, Borna and Stearns, 2009). Following this step, two models are examined for the hypothesised moderation effect. One model is restricted, so that all the paths influenced by the moderators are constant at (1). The second model is not restricted, and all the paths included in the structural model are permitted to be tested smoothly without restriction (Brockman and Morgan, 2003). A considerable difference (P<0.05) between the models examined indicates that the moderating construct significantly impacts the hypothesised relations. For the purpose of this study, the moderation role is examined through the employment of a multi group analysis technique (Byrne, 2016; Sharma, Borna and Stearns, 2009). This option has been selected because the constructs under investigation (moderator, independent variables and dependent variables) are discrete and the variables are measured, and also because of its validation in the literature and its simplicity. Furthermore, Vinzi et al. (2010) and Rigdon, Schumacker and Wothke (1998) indicated that the moderation

techniques discussed previously based mainly on the product term, are more likely to be selected when interaction occurs between non-discrete variables; whereas it is rational to select multi-group analysis when interaction occurs between discrete variables. Generally, as long as significant variance does not occur among the groups investigated, similar results will be achieved irrespective of whether product term or multi-group analysis is employed (Vinzi *et al.*, 2010).

In the present research, the sample is subdivided into two groups, "high-culture (N=410)" and "low-culture (N=220)" according to the median of uncertainty avoidance (Baron and Kenny, 1986; Chiu *et al.*, 2012). In order to further examine the moderating role of uncertainty avoidance, the formula recommended by Chin, Marcolin and Newsted (2003) is used to evaluate the differences in path coefficients between the "high-culture" group model and the "low-culture" group model. The approach of Ahuja and Thatcher (2005) and Chang *et al.* (2014) is followed to calculate the T-statistics. The comparison is performed with both measurement-model and structural-models. Table 5.14 presents the comparative weights of the constructs comprised in the final model.

	High-culture		Low-culture	P value
TRUG	0.172	TRUG	0.219	0.09
TRUT	0.109	TRUT	0.206	0.37
TRUW	0.136	TRUW	0.217	0.08
EOU	0.218	EOU	0.264	0.03
USF	0.126	USF	0.212	0.42
RELT	0.194	RELT	0.190	0.36
COMP	0.205	COMP	0.264	0.07
COML	0.182	COMPL	0.116	0.41
SOCL	0.160	SOCL	0.257	0.38

Table 5.14: Weight Comparison

It is clearly noted in Table 5.14 that majority of the (p-values) were statistically insignificant (P-values are greater than 0.05), implying there was no invariance among the measurement-models examined in the two subsamples. This proves that the measures employed in the questionnaire were equivalent in the two subsamples. Accordingly, the investigator is able to progress the comparison of the path coefficients and the multi-group analysis.

Table 5.15 (below) illustrates the finding that relative advantages, compatibility and complexity exert a weaker impact on the intentions to use e-gov systems of citizens with higher levels of culture. Our results indicate that the effect of relative advantages, compatibility, and complexity on citizens' intentions to use e-gov systems are significantly moderated by cultural factors, e.g., uncertainty avoidance.

Tuble offe Sudstieur Comparison of Latins							
Path	High Culture (R ² =0.46)		Low Culture (R	Statistical			
	Standardized	T value	Standardized	T value	comparison		
	path		path coefficient		of paths		
	coefficient						
REL> INTN	0.37	4.39***	0.43	2.12*	2.39**		
COMP→ INTN	0.19	2.31*	0.32	2.18*	3.47***		
COML INTN	0.47	4.84***	0.37	4.35***	1.28**		

Table 5.15 Statistical Comparison of Paths

Note: P* <0.05, P** <0.01 and P*** <0.001

5.6 A Configuration Technique Utilising Fuzzy-set Qualitative Comparative Analysis (fsQCA)

Table 5.7, displayed previously, shows that the value of some of the estimated correlation coefficients are higher than 0.60. This implies that the relationships that were tested between model variables and the intentions to use e-gov system are asymmetric, and so the same outcomes may be generated by alternative combinations of causal conditions (Pappas and Papatheodorou, 2017). The present study therefore employed a configuration approach through utilising fsQCA to give an inclusive understanding of the drivers of individuals' intentions to use e-gov systems in KSA. The fsQCA approach explores the ways in which causal conditions as configurations connect to the outcomes of interest by using the set theory approach (Fiss, 2011). The fsQCA technique has been used to analyse data in order to understand which conditions lead citizens to a certain outcome (Ragin and Davey, 2014) (in this case, intentions to use e-gov services). Adopting the fsQCA approach, the data were modified to fit the membership extent of cases in sets with values between 0.0 and 1.0 thereby changing the conventional factors into fuzzy factors (Rihoux and Ragin, 2008).

In the present study, a combination of trust toward technology, trust toward government, trust toward e-gov webpages, perception of usefulness, perception of ease of use, relative advantage, compatibility, complexity and social influence drivers are hypothesised as the causal conditions that influence intentions to use e-gov services. The fsQCA technique reveals how different variables can affect citizens' intentions to use egov system. However, it would be difficult for the government to strengthen citizens' intentions to use e-gov systems by pursuing every driver at a high level. Different combinations of these variables should be investigated in order to identify which combinations of them contribute to strengthening citizens' intentions to use e-gov systems. For that reason, the fsQCA technique explores different combinations of variables between the comparable cases that result in a stronger intention of citizens to use e-gov systems.

Ragin (2009a) indicated that, after constructing the data set, the next step in utilizing fsQCA technique is to calibrate the causal conditions (perception of usefulness, perception of ease of use, trust toward e-gov, trust toward technology, relative advantage, compatibility, complexity) and the outcome (i.e., consumers' intentions to use an e-gov systems). The present study utilizes the direct method as the calibration method (Ragin, 2009a). The study variables are measured by the Likert scale, and use the original values of 1, 3, and 5 as 'no membership,' 'cross over point', and 'full membership' respectively. The consistency value can be treated as correlations and the coverage can be treated as R^2 .

5.6.1 Results

5.6.1.1 Necessity Analysis for High e-gov Adoption

A logical necessity analysis spotlights the essential individual conditions for a given result, which is the first step in the analysis of fsQCA results (Mendel and Korjani,

2013; Stanciu *et al.*, 2018; Veríssimo, 2016). These individual conditions would be necessary, however, not sufficient to produce an outcome (Kent, 2015). A fussy set variable or a set of variables are considered "necessary" or "almost always necessary" when the consistency value equals or exceeds 0.90 ,and it is advised that it should be a minimum of 0.80 (Fiss and Marx, 2013; Ragin, 2006; Ragin, 2009b). Such a condition will possibly be a component of all sufficient conditions (Ragin, 2009b). Regarding necessity conditions for high e-gov services adoption, with a consistency score exceeding the 0.90 threshold, Table 5.16 shows that TRUG, TRUW, COML, and SOCL are the four necessary factors associated with high e-gov service adoption. It can therefore be claimed that TRUG, TRUW, COML, and SOCL factors are necessary but not sufficient for the achievement of high e-gov service adoption.

	Consistency	Coverage
TRUG	0.97	0.83
TRUT	0.78	0.81
TRUW	0.95	0.86
EOU	0.52	0.74
USF	0.73	0.77
RELT	0.48	0.53
СОМР	0.49	0.67
COML	0.96	0.87
SOCL	0.92	0.82

Table 5.16: Necessity analysis for high e-gov services adoption

The next stage is to analyse the sufficient conditions by constructing, refining and analysing the truth table (Fiss, 2011; Mendel and Korjani, 2013; Ragin, 2009a). According to Ragin and Sonnett (2005), the truth table provides three substitutional results, namely complex, parsimonious and intermediate. The first one provides the minimum simplification to the sufficient configuration, and thus it has the highest amount of detail, while the second one provides the maximum. The final one contains theoretically reasonable counterfactuals exclusively and can be easily interpreted. Therefore, on the basis of the recommendations of the researchers cited above, an intermediate solution is used. Table 5.17 below shows the results of fsQCA analysis of citizens' intentions to use e-gov systems (intermediate solution with consumers' intention). Black dots "•" present the presence of a causal condition and white dots "o" present the absence or denial of a condition and the blank indicate a "does not matter" condition. The raw coverage and consistency measures for each solution are included in Table 5.15. This demonstrates how far citizens' intentions to use e-gov systems are determined by the identified configurations of perceptions of usefulness, perceptions of ease of use, trust toward government, trust toward technology, trust toward e-gov webpages, relative advantage, compatibility, complexity and social influence drivers.

The configurations consistency value, which is similar to path coefficient in PLS-SEM, that is, equal to, or more than, 0.80 shows that the pathways almost always drive to the stated outcome (Fiss, 2011; Ragin, 2009a). Coverage value, which is similar to the R^2 in PLS-SEM, that ranges between 0.25-0.65 is considered informative (Fiss, 2011). According to the results in Table 5.17, no single variable will strengthen citizens' intentions to use e-gov system, but combinations of variables will do so. In particular, the results identify with great raw consistency, (greater than 0.90), three solutions that strongly drive citizens' intentions to use e-gov systems.

Solution 1 suggests that the presence of trust toward government, trust toward e-gov webpages, perception of ease of use, complexity, and social influence, together with low perception of usefulness and relative advantages, will lead to a strong intention among citizens to use e-gov systems, even in the absence of trust toward technology and compatibility, given its consistency value of 0.98. This configuration is shared by 82% of the citizens (raw coverage). Otherwise, configuration 2 shows that the presence of trust toward government, trust toward e-gov webpages, relative advantages, and social influence and a low trust toward technology and ease of use will result in a high intentions of citizens to use e-gov systems, even in the absence of perception of usefulness, compatibility and complexity, given its consistency value of 0.96. This configuration is

shared by 74% of citizens (raw coverage). Solution 3 shows that the presence of trust toward government, trust toward technology, trust toward webpages, ease of use, and complexity and a low perceptions of usefulness will result in high consumers' intentions to use e-gov services, even in the absence of relative advantages and compatibility, given its consistency score of 0.92. This configuration is shared by 18% of the consumers (raw coverage). Table 5.15 demonstrates that all consistency scores are at least 0.95, implying that these configurations are sufficient to indicate high citizens' intentions to use e-gov systems. Solution coverage is greater than 0.8, which suggests that the solution accounts for a large proportion of citizens' intentions to use e-gov systems.

Solution	TRUG	TRUT	TRUW	EOU	USF	RELT	СОМР	COML	SOCL	Raw	Consistency
										coverage	
1	•		•	•	0	0		•	•	0.82	0.98
2	•	0	•	0		•			•	0.74	0.96
3	•	•	•	•	0		•		•	0.18	0.92

Table 5.17 Intermediate solutions with citizens' intentions to use e-gov services

Note: •= Presence of a condition; \circ =Absence of a condition; Blank circle = Do not care; Overall solution coverage = 0.86; Solution consistency= 0.95

5.7 Conclusion

In this chapter, the statistical approaches used for the data analysis were presented. The chapter began with an account of data preparation and the collection process. Then, pre-analysis and data processing were discussed. The discussion included data coding, data cleaning and screening, assessing non-response bias, a normality test, common method bias and descriptive statistics. Next, there was discussion of the data analysis approach, Structure Equation Modelling (SEM), with clarification of the advantages of using that approach. The chapter then explained the process of assessing the measurement model, including individual item reliability, reliability assessment, validity assessment (convergent validity and discriminant validity), full collinearity VIFs and Qsquared coefficient assessment. Assessment of the measurement model was followed by an assessment of the structural model, including model fit indices; results of the overview of the hypothesised paths coefficients; the effect (total, direct and indirect effect); and the effect of the hypothesised moderators. The chapter ends with a discussion of the configuration approach, which utilised Fuzzy-set Qualitative Comparative Analysis (fsQCA) and its results, which included three solutions.

The chapter that follows will present a deep discussion of the findings derived from the analysis in this chapter.

CHAPTER SIX

DISCUSSION

6.1 Introduction

The previous chapter discussed the analysis procedure, which helped to explain the ways that data is prepared, coded, cleaned and screened. It then evaluated nonresponse bias, addressing the issues of outliers, multicollinearity and normality. The measurement model was assessed through the investigation of Confirmatory Factor Analysis (CFA) and the structural model was assessed through testing the hypothesised research relationships with "WarpPLS" statistical analysis software. Lastly, the configurations approach was presented, using Fuzzy-set Qualitative Comparative Analysis (fsQCA) with its findings and solutions.

The current chapter will attempt to fulfil the last three aims of the thesis. These are: to add contributions to the knowledge of the existing literature of e-gov adoption in general, and particularly in the context of KSA; to provide practical recommendations to enhance the adoption of e-gov; to state the implications of the study and to make recommendations for further research. There will be a detailed discussion of the results of the current hypothesised relationships and of the recipes derived from the use of fsQCA.

The empirical findings and the results of testing the research hypothesises in the analysis chapter will be discussed in detail, with consideration of previous studies as well as the context of the research itself. The chapter will be divided into two sections, namely the findings from "WarpPLS" results in respect of to the proposed research hypothesises and the finding of fsQCA. The chapter will end with a discussion of the final research model and a conclusion.

6.2 Discussion Related to Research Hypothesises

The model of this research hypothesised that citizens' trust toward e-gov webpage is influenced by 'trust toward government', 'trust toward technology', 'perceived ease of use' and 'relative advantages.'

Citizens are likely to be confident in using e-services when their trust toward government is increased (Reddick and Roy, 2013). Consequently, integrity and reliability is reinforced (Belanger and Carter, 2008; Benbasat, Gefen and Pavlou, 2008; Lee, Kim and Ahn, 2011; Srivastava and Teo, 2009). Trust is highly depend on the way that governments function and therefore it is a developmental process and can change rapidly (Karkin and Janssen, 2014; Srivastava and Teo, 2009). Few studies of e-gov have considered the role played by trust (Beldad et al., 2012; Lee, Kim and Ahn, 2011; Schaupp, Carter and McBride, 2010). Although it is known that trust toward technology plays an important role in this context, few studies have theorised trust toward e-gov as an important antecedent (Belanger and Carter, 2008; Jafari et al., 2011; Teo, Srivastava and Jiang, 2008). The existence of citizens' trust toward e-gov webpages is highly dependent on trust toward the government itself (Belanger and Carter, 2008; Lee, Jung and Kim, 2011; Schaupp, Carter and McBride, 2010; Teo, Srivastava and Jiang, 2008). Consequently, the existence of the latter determines citizens' trust government services (Lee, Kim and Ahn, 2011; Srivastava and Teo, 2009; Teo, Srivastava and Jiang, 2008), and so citizens' trust toward technology and in government determines readiness to adopt e-gov (Beldad, De Jong and Steehouder, 2011; Beldad et al., 2012; Lee, Kim and Ahn, 2011; Reddick and Roy, 2013).

• Trust Toward Government and Trust Toward Technology

Hypothesis 1. Trust toward government in KSA positively impacts trust toward e-gov webpages.

Hypothesis 2. Trust toward technology in KSA positively impacts trust toward e-gov webpages.

The findings of this study indicate that 'trust toward government' and 'trust toward technology' have a significant positive effect on citizens' trust toward e-gov webpages. Therefore, H1 (β =.37, p <.001) and H2 (β =.41, p <.001) are supported. Few studies have used the trust factor in the context of e-gov (Beldad et al., 2012; Lee, Kim and Ahn, 2011; Schaupp, Carter and McBride, 2010). Some studies have considered trust toward technology as a strong influencer but few have explored trust toward government as antecedents (Belanger and Carter, 2008; Jafari et al., 2011; Teo, Srivastava and Jiang, 2008). Despite the valuable contribution of TAM to the application of technology-related adoption as a parsimonious model, trust is believed to play an integral role in the prediction of citizen's' trust toward e-gov webpages (Tan, Benbasat and Cenfetelli, 2008). The findings of this research are in harmony with these studies e.g., Chen et al. (2015); Chong et al. (2010); Lee-Geiller and Lee (2019); Montazemi and Qahri-Saremi (2015); Ranaweera (2016); Shuib, Yadegaridehkordi and Ainin (2019). Thus, citizens' trust toward government webpage exists when citizens trust their government and the technology that is used to deliver e-gov services (Belanger and Carter, 2008; Lee, Jung and Kim, 2011; Schaupp, Carter and McBride, 2010; Teo, Srivastava and Jiang, 2008; Weerakkody et al., 2013). These results emphasise the government's need to build citizens' trust toward e-gov webpages in order to promote the adoption of e-gov services. In constructing webpages, it is important to consider social aspects and to take into account citizens' expectations. The government needs to reinforce citizens' confidence that government transactions conducted electronically are at least as safe and efficient as those conducted by the methods formerly employed. Citizens' fear of potential manipulation by government employees could best be overcome by targeting particular categories of the population, for example, those who

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are more willing to trust and to take risks and those who already have technological awareness and knowledge. Then, with an increase in the number of successful cases of e-gov adoption, oral messages could be employed to promote public awareness. This measure could be combined with improvements to governmental institutions by using social media and other channels to reinforce the measures previously suggested. However, part of the findings of this research contradict those of Horsburgh, Goldfinch and Gauld (2011), who concluded that citizens' trust toward government does not play an important role in influencing their trust toward e-gov. This contradiction is likely to be attributable to the context of their study, which was Australia and New Zeeland.

Despite the recent dramatic technological growth that has occurred in KSA, it is nevertheless a less advanced nation that has only recently attempted to build a comprehensive governmental infrastructure for e-gov and to ensure levels of accountability, security and privacy comparable to those of more advanced nations. In addition, KSA culture is in many ways conservative, and so, for example, sharing personal information online, such as photos, particularly photographs of women, would raise serious cultural and social issues. Citizens' fears that their confidential details could be accessed, shared or misused are a major concern in a culture such as KSA, which is the reason why face to face transactions involving government are widely preferred (Alshehri and Drew, 2010b). For the same reasons, mistrust of new technology and fear of being hacked, scammed, spammed or affected by viruses are of greater concern in less advanced nations such as KSA (Alshehri, Drew and Alfarraj, 2012). These could justify the contradicted findings of citizens' trust toward government from KSA that are culturally, socially technologically shaped compared to those advanced nations.

• Trust Toward e-gov Webpage

Hypothesis 3: Trust toward e-gov webpages in KSA positively affects intentions to use e-gov services.

Trust toward e-gov webpages positively influences citizens' intentions to adopt e-gov in KSA (β =.19, p <.05). Thus, H3 is supported. The finding is consistent with Lee and Koubek (2010) as they concluded that webpages play an important role as an interface between citizens and their governments. Citizens' intentions to adopt e-gov in KSA are likely to increase when they feel that government webpages are trustworthy and reliable channels that allow them to interact, transact and request information safely and securely. This finding is consistent with that of George (2002) who emphasised that users' concerns related to the risks associated with the adoption of new technology, e.g. e-gov, as it lowers their intentions of adopt that technology. The result is also supported by the findings of Venkatesh et al. (2016) that the medium used to interact with e-gov, e.g. e-gov webpages, influences citizens' intention to adopt e-gov. Other studies with which these findings are consistent are those of Abu-Shanab (2017); AlAwadhi (2019); Alzahrani, Al-Karaghouli and Weerakkody (2017); Lee-Geiller and Lee (2019); Mahmood, Weerakkody and Chen (2019); Ranaweera (2016). Disclosing personal information might affect citizens' trust toward such means of dealing with government and may result in hindering the adoption of the system (Belanger and Carter, 2008), especially in KSA, where the conservative nature of the culture proved to be among main impediments to the execution of e-gov (Alshehri and Drew, 2010b).

For that reason, it is crucial to enhance Saudi citizens' experience of governmental institutions and of the latter's ability to meet their needs, thus enhancing citizens' trust toward e-gov webpages (Wang and Lu, 2010). In addition, the cost of an opportunistic behaviour need to be high compared to the advantages that gained from such behaviours conducted by any parties. According to Dashti, Benbasat and Burton-Jones (2010), this could enhance the

internal calculated of trust by citizens in the evaluation the between benefits and costs of such unwanted behaviours of those parties. Decision makers also need to focus in the first impression as citizens might seek to cognitively evaluate the new mean of dealing with government (Srivastava and Teo, 2009). These suggestions can be realised through the implementation of strategies and actions plans to help in empowering citizens and enhancing their awareness with regard to e-gov webpages. When Saudi citizens' awareness increases, their understanding of e-gov activities are more likely to increase (Abdelghaffar, Kamel and Duquenoy, 2010). An effective starting point would be an educational approach, using social media platforms such as Twitter, Facebook and YouTube to introduce and promote e-gov webpages, as Saudi citizens are frequent habitual users of these platforms (GlobalMediaInsight, 2018). Consequently, the willingness of Saudi citizens to trust and accept changes will be motivated when they realise the advantages of the system that is being offered, and positive sentiments will proliferate. The involvement of Saudi users in the evolution and transformation of e-gov and its webpages by encouraging them to provide feedback is also a commendable strategy. According to Srivastava and Teo (2009), persistently asking users of a system (e.g. of e-gov) to make suggestions for improvement will increase satisfaction and enhance trust toward that system. This view is also supported by (Alzahrani, Al-Karaghouli and Weerakkody, 2017; Chun et al., 2010). The role played by the users of e-gov plays an important part in the formulation of e-gov policies.

Relative Advantages

Hypothesis 4: A high level of perception of relative advantages positively relates to a high level of trust toward e-gov webpages.

To the best of the researcher's knowledge, the current study is the first to explore the link between relative advantages and trust toward e-gov webpages in the context of e-gov adoption. Venkatesh et al. (2003c), consider that there is no difference between Relative Advantages and Perceived Usefulness which are treated as two different categories in the current research model, Shin (2010), however, clearly differentiates between them. He explained that the category of Perceived Usefulness does not contain an explicit comparison between the online method and its predecessor, which is a crucial aspect of the research. According to the findings of the current research, 'relative advantage' significantly and positively affects citizens' trust toward e-gov webpages (H4) $(\beta=.35, p < .001)$, however, these extra advantages could already exist. Therefore, as mentioned previously, targeting categories of citizens that are more likely to trust, more willing to take risks and already possessing technological awareness could provide the beginnings of a solution, together with the measures of reinforcement already cited. Consequently, with the increase of success cases, oral messages could highly promote the citizen awareness regard those differences between conventional way and the use of e-gov webpage and its extra advantages. In addition, this could be combined with attempts of social improvement to governmental institutions. The use of social media could be a particularly effective measure, as 25 million out of 33.25 million citizens have an active social media account and 18 million have active mobile social accounts (GlobalMediaInsight, 2018). Decisions of online users in KSA are found to be significantly affected by the views of other, socially influential, users and e-ward of mouth and these forms of transmission are able to reach very large numbers of citizens simultaneously (Al Mana and Mirza, 2013). These communications could in turn augment trust toward e-gov webpages as the gap between intention to trust these webpages and their actual use could depend heavily on an understanding of their relative

importance and the advantages offered to citizens (Hynes and Wilson, 2016; Lindenberg and Steg, 2013).

The research model also hypothesised that compatibility and relative advantages, perceived usefulness, trust toward e-gov webpages and social influences positively affect users' intentions to use e-gov services, whereas complexity negatively influences their intentions.

Relative Advantages

Hypothesis 5: A high level of perception of the relative advantages positively relates to a high level of intentions to use e-gov services.

The findings of the research confirm that relative advantage strongly and positively impacting on citizen's' intentions to use e-gov services in KSA (β =.28, p <.001). Citizens' intentions to use e-gov services are probably to rise when it is felt that e-gov services are more efficient than the conventional kind in locating information, interacting with government and performing transactions with it. These findings are consistent with those of Bouwman and Van De Wijngaert (2002); Lee (2001); Moore and Benbasat (1991); Plouffe, Hulland and Vandenbosch (2001); Rath and Sekhar (2010); Richardson (2011); Tan and Teo (2000); Taylor and Todd (1995a); Van Slyke, Lou and Day (2002), but contradict the findings of Carter and Belanger (2005). The possible explanation for Carter and Belanger's findings could be that their study was conducted in an advanced nation where citizens are familiar with services that are similar to e-gov, where Internet surfing is frequent, and where there is familiarity with online shopping. Participants might not perceive e-gov as a novel invention. The context of the present study, by contrast, is a less advanced nation where citizens might be less familiar with online facilities and e-services.

This one of the motive that this research is based on to investigate factors affecting e-gov adoption in the context of less advanced nation (KSA) which could

possibly reveal different finding than advanced nations as the result of Carter and Belanger (2004b) and (2005) that revealed different finding despite they have been conducted in the same context. In addition to that, the study conducted by Carter *et al.* (2016) who find contradicted findings between United States and United Kingdom in his comparative study also support such aim to understand e-gov adoption in different context. The religion, culture, and the tribes system are rooted in the system of KSA, therefore, underestimation of such influence of a context might lead to wrong generalisation of other studies to be applicable in KSA.

• Compatibility

Hypothesis 6: High level of perception of compatibility positively relates to the high levels of intentions to use e-gov services.

The findings of the research indicate that compatibility has a significant impact on users' intentions to adopt e-gov (H6) (β =.49, p <.001). The findings are in harmony with past studies in the context of e-commerce e.g. Christou and Kassianidis (2002); Kim, Kim and Leong (2005); Kim and Lee (2006); Moital, Vaughan and Edwards (2009); Wong and Law (2005); tax e-filing services Hung, Chang and Yu (2006b); Ojha, Sahu and Gupta (2009); and e-gov Shareef *et al.* (2011); Shuib, Yadegaridehkordi and Ainin (2019). When there is congruence between citizen's life style and work (e.g. using social media, familiarity with web navigation and online communications ,such as email) and e-gov services are provided, citizens are more likely to perceive e-gov as being compatible with their life-styles and therefore adopt it. Compatibility positively influences early adoption, and also influences continuity of adoption (Sun and Jeyaraj, 2013). This suggests that citizens assess the compatibility of e-gov systems both prior to and subsequent to adoption. It also implies that government needs to make its e-gov services harmonise with citizens' previous experience in dealing with conventional government services. For example, e-forms should be consistent with conventional government forms. Moreover, standardising e-gov webpages would be an important way to increase citizens' perception of compatibility, which would in turn increase their adoption of e-gov services. In contrast to more individualist cultures, Saudi culture, with its tendency to collectivism, has shown a resistance to the use of new technology, and there is a preference for face to face interaction with other people (Aldraehim *et al.*, 2013; Loch, Straub and Kamel, 2008). Therefore, compatibility of the system is crucial.

• Complexity

Hypothesis 7: High level of perceptions of complexity negatively relates to high level of intentions of using e-gov services.

The findings of the research confirm that complexity negatively influences citizens' intentions to use e-gov services (H7) (β =.71, p <.001). Conversely, when citizens perceive that e-gov transactions can be accomplished as easily as the conventional kind, there is a high probability that e-gov services will be adopted. Therefore, attention needs to be given to the way in which e-gov services are presented to the public. Information needs to be simple and easily remembered and offered in a form that enables previous knowledge to be used in the new context and generalized (Webb, 1997). For example, e-gov information and services need to be easy to locate and navigate by the employment of standards and methods made familiar by, for example, online shopping. This finding is consistent with previous studies Venkatesh et al. (2003a), Al-Shafi and Weerakkody (2010), Alomari (2014), Weerakkody et al. (2013), Al-Gahtani (2003), Alateyah, Crowder and Wills (2013), Al-Ghaith, Sanzogni and Sandhu (2010), Alghamdi and Beloff (2014), Choudrie, Alfalah and Spencer (2017), Alomari, Woods and Sandhu (2012c), and Lean et al. (2009). On the other hand, this finding is contradicted by the findings of Alsaif (2014), who also conducted his study in KSA. However, this contradiction could be explained by the fact that Alsaif (2014)

performed his study in the very early stages of the implementation of e-gov, when basic tasks, such as downloading forms and looking for information, required less effort. E-gov in KSA has become more technologically advanced since then, which could explain Alsif's finding. However, sometimes the complexity of a task does not mean that it is difficult to complete (Webb, 1997). The system might perform basic tasks if it is kept simple. Further analysis and an interesting finding in this regard is to be found in the fuzzy set qualitative comparative analysis section.

• The Moderating Role of Culture (Uncertainty Avoidance)

Hypothesis 8a: Culture (uncertainty avoidance) moderates the link between relative advantages and intentions to use e-gov.

Hypothesis 8b: Culture (uncertainty avoidance) moderates the link between compatibility and intentions to use e-gov.

Hypothesis 8c: Culture (uncertainty avoidance) moderates the link between complexity and intentions to use e-gov.

This block discuss the moderating effect of culture (Uncertainty Avoidance) on the links between the three DOIs variables in the model (relative advantages, compatibility and complexity) and citizens intention to use e-gov services (H8a, H8b and H8c). The role played by culture in the use and adoption of /IS related applications is very important (Tam and Oliveira, 2019). Several studies have investigated the role of culture, seeking an explanation of its effect on IT/IS use, adoption and implementation (Calhoun, Teng and Cheon, 2002; Leidner and Kayworth, 2006; Rose, Evaristo and Straub, 2003). The characteristics of an e-gov system that is suitable for one culture might be unsuitable for another. According to Baskerville (2003), cultural differences not only exist between countries, but also between individuals who live in a particular country. In the context of the adoption of IT/IS related applications, the

moderating role played by cultural dimensions, e.g. uncertainty avoidance, in influencing individual intention to adopt those applications has been found to be significant (Baptista and Oliveira, 2015; Lee *et al.*, 2007). The prime reason for selecting uncertainty avoidance is to address issues associated with the e-gov design and individual behaviour with regard to such systems, and to explore the way that the different cultural characteristics of citizens influence the development of e-gov services.

Hofstede's culture model is well established and has been successfully applied in IT/IS related applications using one or more of its dimensions (Leidner and Kayworth, 2006). Uncertainty avoidance has been adopted for several reasons. Firstly, Hofstede's cultural dimensions is a developed model. Secondly, its validity has been examined by others (Baptista and Oliveira, 2015; Lee *et al.*, 2007). Thirdly, its dimensions have been successfully examined in the context of e-gov adoption (Zhao, 2011; Zhao, 2013), and in the current research, the influence of culture was tested in the adoption stage and it has not previously been tested in that context. Fourthly, it has been found that uncertainty avoidance is one of the most widely and successfully used dimensions in the literature of the adoption and use of IT/IS related applications (Leidner and Kayworth, 2006). Tam and Oliveira (2019) have indicated that uncertainty avoidance has a significant impact on individual decisions on whether or not to adopt IT/IS. There findings indicate that the wish to avoid uncertainty is responsible for much of the anxiety associated with the adoption of systems such as e-gov.

The findings of this study indicate that uncertainty avoidance moderates the relationship between relative, compatibility, and complexity and users' intention to adopt e-gov services in KSA. Therefore H8a, H8b and H8c are supported. The results show that relative advantages, compatibility, and complexity exert a weaker impact on citizens' intentions to use e-gov for the group of citizens with a high level of uncertainty avoidance, whereas the effects are stronger for the group of citizens with low levels of uncertainty avoidance. This supports the findings of Hofstede (2001) that rules and more structured environment are preferred by those citizens with high value of power distance, masculinity, collectivism, and uncertainty avoidance. Conventional ways of requesting information and transacting with government are more likely to be the preferred approach of older and more conservative citizens, who tend to see unstructured situations as a novelty that raises concerns over security, and who are likely to view the unknown as threatening (Hofstede, 2011). Their perception of the risks associated with the use of new IT/IS related application, e.g. e-gov, make it less acceptable to them. They are more likely to feel that new technology is not easy to use, due to lack of confidence and the expectation of making mistakes in their interactions.

The moderating effect of uncertainty avoidance in the model implies that relative advantages, compatibility, and complexity are less important in explaining citizens' adoption of e-gov in KSA, where users' uncertainty avoidance is at a high level. The findings of this study are in line with previous studies Al-Hujran *et al.* (2015); Khalil (2011); Nam (2018); Tam and Oliveira (2019); Warkentin *et al.* (2002); Zhao (2011); Zhao (2013). Warkentin *et al.* (2002) emphasised in their study the significant influence of uncertainty avoidance and power distance. They concluded that both are likely to be the ultimate dimensions that determine citizens' the adoption of e-gov. The outcomes of the present study point out that as culture differences do not only exist between countries, but also exist between individuals who live in a particular country (Baskerville, 2003). It is crucial to understand these

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differences when promoting the adoption of e-gov. Each country, including, KSA, has its unique context, culture and beliefs that need to be given careful attention in the evaluation and implementation of e-gov systems.

• Perceived Ease of Use

Hypothesis 9: Perceptions of ease of use positively influences trust toward e-gov webpages in KSA.

For Perceived Ease of Use, the model TAM, proposed by Davis (1986), is one of the most highly validated models in technology and IS acceptancerelated applications (Ismail and Osman, 1970; Joo and Sang, 2013; Malaquias and Hwang, 2016; Persico, Manca and Pozzi, 2014; Workman, 2014; Zhu and Chang, 2014). The theory suggests that there are two determinants of people's acceptance of IT and IS related applications, namely perceptions of Ease of Use and of Usefulness. However, there have been concerns over the use of TAM in cultural contexts characterised by a high degree of Uncertainty Avoidance (McCoy, Galletta and King, 2007).

Despite these concerns, the findings of this study support the validation of TAM in KSA as Perceived Ease of Use has a positive significant impact on citizen' trust toward e-gov webpages (H9) (β =.18, p <.05). This support is reinforced by the findings of Agag and El-Masry (2016a) who proved the significant impact of Perceived Ease of Use on the earlier phase of adoption. The current research results are also consistent with the findings of previous previous studies e.g. (Agag and El-Masry, 2016a; Ayeh, Au and Law, 2013), that is, the investment in e-gov webpages could send a positive message that the government is committed to building good relationships with its citizens. Indeed, e-gov webpages are the primary means of interaction with citizen, and thus such committment is widely noticed. The government needs to emphasies the usability and navigability of its webpages to send positive signals that imply good investment in the relationship with its citizens. Saudi Citizens need to experience less cognitive effort so their brain is able to use the previous built schema of using webpage and extend it easly to build a new one for e-gov webpage (Council *et al.*, 2000). The procedure for adopting a new e-gov webpage needs to require only a small amount of cognitive effort in a country like KSA, which has a high uncertainty avoidance score (Gatignon and Robertson, 1985). With the increase of Saudi citizens' usage of the system, the requirement for cognitive effort will gradually diminish (Limayem, Hirt and Cheung, 2007). Although Percieved Ease of Use is not the only influence on citizens' trust toward e-gov webpages, its contribution cannot be ignored (Al-Hujran *et al.*, 2015; Al Khattab *et al.*, 2015; Alateyah, Crowder and Wills, 2013; Carter and Belanger, 2005; Carter *et al.*, 2016; Horst, Kuttschreuter and Gutteling, 2007; Lin, Fofanah and Liang, 2011; Phang *et al.*, 2006).

• Perceptions of Ease of Use to Perceptions of Usefulness:

Hypothesis 10: Perceptions of ease of use positively influences perceptions of usefulness in KSA.

The outcomes of the study confirm the positive and significant influence of perceptions of ease of use on perceptions of usefulness (H10) (β =.69, p <.001). The findings support the assumption of TAM that when individuals perceive egov as an easy system to use, as understandable and requiring no cognitive efforts, their intentions to use it are likely to increase. Their assessment of the difficulty of using the services and the effort it requires is likely to determine the perceived usefulness of the services. This finding is in agreement with that of Agag and El-Masry (2016a) who paid attention to the crucial role played by PEOU, especially in the earlier phase of adoption. Morover, there is consistency with previous studies that confirm the positive and significant impact of PEOU (Agag and El-Masry, 2016a; Ayeh, 2015a; Cherchi, 2017; Kim, Rasouli and Timmermans, 2014; Manca, Sivakumar and Polak, 2019). More important is that this study offers a useful insight related to the doubts expressed in previous studies as to whether TAM can be applied in a cultural context that is characterised by high levels of uncertainty avoidance, power distance, and masculinity, such as KSA. This study confirms the capacity of TAM to be applied and generalised in such a context e.g. (Agag and El-Masry, 2016a; Ayeh, Au and Law, 2013)

• Perceived Usefulness

Hypothesis 11: Perceptions of usefulness positively influences intentions of using e-gov services in KSA.

The link between perceptions of usefulness and citizens' intentions to adopt e-gov services is, however, not supported (H11) (β =.08, NS). Despite the significant and positive relationship in the current model between relative advantages and intention to use and adopt e-gov (H5), Saudis citizens give no attention to the perceived usefulness of the system. A possible explanation for this finding is that Saudi citizens can see the advantages of e-gov services compared with the conventional kind, but lack confidence in their ability to perform the relevant tasks, despite the ease of use of the online service (H10). This could imply that PU need to be developed more as Venkatesh *et al.* (2003a) advised in their study to use the expected performance of the system. The finding of the relationship between PU and citizens' intention to use online services is in line with the conclusions of Agag and El-Masry (2016a) and Carter and Bélanger (2005a) except for relative advantages in the latter. As stated previously, citizens in less advanced nations such as KSA could perceive an e-gov system as a novelty, whereas in the advanced nations where Carter and Bélanger (2005a) conducted their study, e-gov would not be perceived as a novelty because citizens of those countries are already familiar with similar services and systems.

• Social Influence

Hypothesis 12: Social influences positively affect Saudis' intentions to use egov services.

TAM does not include the Social Influences construct which is included in several models and is described by terms such as Social Influence in UTAUT, Image in DOI, Social Factors in MPCU and Subjective Norms in TPB and TRA. Venkatesh et al. (2003b), described social influence as the extent to which individuals' perception that other individuals in the same society consider the use of the system, i.e., e-gov services, to be important. Horst, Kuttschreuter and Gutteling (2007) found that Subjective Norms are strongly and positively impacting on individual users' intentions to adopt e-gov systems. In similar vein, the substantial effect of Social Influence in the adoption of e-gov has been confirmed in two studies conducted in Qatar by Al-Shafi and Weerakkody (2007) and in Kuwait by AlAwadhi and Morris (2008). Thus, individuals' decision processes are likely to be affected by the surrounding culture. Srite and Karahanna (2006) attribute the effect of social influence on individuals' intentions to the type of culture, that is to a culture which is characterised by a high degree of uncertainty avoidance and femininity. Other studies confirm a link between citizens' failure to adopt e-services and a society which is characterised by high degrees of power distance and collectivism (Arslan, 2009; Erumban and de Jong, 2006). KSA culture is characterised with a high degree of power distance, uncertainty avoidance and a low value accorded to individualism. This illustrates the substantial impact of individuals' respect for the opinion of relatives and other people in society. Thus, social influence is added to this study in the context of KSA as it is believed to influence citizen's intention to adopt egov.

The findings of the study confirm the positive and significant influence of social infuluence on citizens' intention to use e-gov services (H12) (β =.56, p <.001). These findings are in line with those of Xie et al. (2017) and are also consistent with those of AlAwadhi and Morris (2008) and Shafi and Weerakkody (2009). As stated previously, Saudis are more likely to be influenced by the judgments and expectations of others i.e., society and people close to them. Individuals in Saudi culture tend to work in groups and the interrelationships between them are valued. However, the findings are inconsistent with George (2004) who found that social influence does not affect customers' attitudes in the context of e-commerce. In a similar vein, Shih and Fang (2004) indicated that the relationship between social norms and customers' adoption of Internet banking is not significant. These findings are probably attributable to the difference between the culture and values of Saudis and the culture and values that predominate in the countries where the studies were conducted. Individuals who live within a social context and culture like that of KSA, where a low value is placed on individualism, are more likely to be affected by the opinions and expectations of others. Another possible explanation is offered by by Venkatesh et al. (2003c), which is that the link between social influence and adoption of new technology is not significant when the adoption is not compulsory, whereas the adoption of e-gov in KSA is partly compulsory and this could explain the findings.

The synopsis of the hypothesised research relationships in the model are presented in the following table.

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H #	Hypothesised relationship	Result
H1	Trust toward government in KSA positively impacts trust toward e-gov webpages.	Supported
H2	Trust toward technology in KSA positively impacts trust toward e-gov webpages.	Supported
H3	Trust toward e-gov webpages in KSA positively affects intentions to use e-gov services.	Supported
H4	A high level of perception of relative advantages positively relates to a high level of trust toward e-gov webpages.	Supported
H5	A high level of perception of the relative advantages positively relates to a high level of intention to use e-gov services.	Supported
H6	High level of perception of compatibility positively relates to the high levels of intention to use e-gov services.	Supported
H7	High level of perception of complexity negatively relates to high level of intention of using e-gov services.	Supported
H8a	Culture (uncertainty avoidance) moderates the link between relative advantages and intention to use e-gov.	Supported
H8b	Culture (uncertainty avoidance) moderates the link between compatibility and intention to use e-gov	Supported
H8c	Culture (uncertainty avoidance) moderates the link between complexity and intention to use e-gov.	Supported
H9	Perception of ease of use positively influences trust toward e- gov webpages in KSA.	Supported
H10	Perceptions of ease of use positively influences perceptions of usefulness in KSA.	Supported
H11	Perception of usefulness positively influences intention of using e-gov services in KSA.	Not Supported
H12	Social influences positively affect Saudis' intentions to use e- gov services.	Supported

6.3 The Final Proposed Model of the Research:

The current research has investigated e-gov adoption in KSA from the viewpoint of its citizens. The developed and validated model is a product of the integration of TAM, DOI with the model of Trust and Risk. The model also considers social aspects, adding social influence and cultural aspects of KSA by employing Hofstede's culture dimension (Uncertainty Avoidance). The individual item reliabilities of the model are satisfied with all items exceeding 0.50 (p<0.001). Also, the model's reliability assessment shows that its constructs have internal consistency, as Cronbach's alpha and composite reliability were greater than 0.70. The convergent validity of the model constructs is confirmed, as

the Average Variance Extracted of each item in the model is above 0.05. Discriminant validity is also confirmed by satisfying the condition that the square root of each construct's AVE is greater than its shared variance with other constructs. There is no multicollinearity problem, as "Variance Inflation Factors" (VIFs) results show all items are not above 3.3. The productive validity is supported, as the result of Q-squared Coefficients Assessment related to each construct is above zero. Its fit indices show a good fit model, as Average Path Coefficient (APC) and Average R-squared (ARS) are significant. Moreover, the Average Variance Inflation Factor (AVIF) is below 5.

Trust toward e-gov webpages is the first dependent variable which is correlated with trust toward government, trust toward technology, perceived ease of use and relative advantages. These independent variables explain 29% of the variance with R-square = (0.29) and this is a significant contribution to the results.

The study results also indicate that citizens' trust toward webpages is strongly predicted by trust toward technology, trust toward government, relative advantages and perceived ease of use. However, the results confirmed that citizens give greater attention to trustworthiness and relative advantages to be gained from e-gov webpages than to the easiness of using them. Citizens' trust toward e-gov webpages is reduced when they do not trust the technology used and the government that delivers the services. These findings are supported by Reddick and Roy (2013). The findings also confirm the results of Lee-Geiller and Lee (2019); Ranaweera (2016); Shuib, Yadegaridehkordi and Ainin (2019). More interestingly, the findings of this research confirmed the suggestion for the future research of Alsaif (2014), who noted the Pearson correlation between trust toward government and trust toward the Internet for .509 at (p<.05). Thus, he suggested trust toward government would be an antecedent to trust toward the webpage or the Internet. In addition, a new insight is revealed by the indication that citizens' trust toward government webpages is also reduced when the relative advantages of using a webpage

are fewer than those offered by the conventional media for dealing with the government. To the best of the researcher's knowledge, this relation has not been explored before, and it is therefore an important contribution to the research results.

The second dependent variable is 'intentions to use e-gov services, which is hypothesised to be influenced by trust toward e-gov webpages, perceived ease of use, perceived usefulness, relative advantages, complexity, compatibility and social influence. The outcome of the multiple regression shows that those variables explain 81% of the intentions to use e-gov service variance (R-square = 0.81), and this is also a significant contribution to the current study results. The results show that complexity is the strongest predictor of intentions to use e-gov services, and confirm that citizens give greater attention to the simplicity of the system than to other factors when making comparisons with the conventional ways of dealing with government. So, individuals' reluctance to adopt e-gov systems decreases with the increase of the complexity of the system, as they find themselves confident that they can use it without difficulty. Perceived ease of use, social influence, compatibility, relative advantages and trust toward e-gov webpages are seen to strongly influence users' intentions to use e-gov services. However, perceived usefulness, surprisingly, was found to have no significant influence on citizens' intention to adopt e-gov services. Therefore, perceived usefulness was removed from the final model.

When the variables (relative advantages, complexity and compatibility) were moderated by Hofstede's' cultural dimension (uncertainty avoidance), the current study results indicate a weaker impact on users' intentions to use e-gov for the group of citizens with a high level of uncertainty avoidance. Whereas, the effects are stronger for the group of citizen with a low level of uncertainty avoidance. The results support the findings of Hofstede (2011), as citizens with a high extent of uncertainty avoidance have propensity to avoid unstructured situations due to their perception of risk associated with ambiguity. Saudis see e-gov as a new system and they are not confident in their ability to perform tasks without making mistakes. H7 supports this finding as complexity is found to be the strongest predictor of citizens' intentions to use e-gov. The results also confirm those of Tam and Oliveira (2019) who emphasised the importance of uncertainty avoidance in determining individual decision on whether to adopt IT/IS. H7 also confirms Baskerville (2003) assertion that cultural differences exist between citizens of a country, as well as between countries.



Figure 6.19 Research Adoption Model

6.4 Discussion of Fuzzy-set Qualitative Comparative Analysis

The complication of understanding individual behaviour and the intention to adopt e-gov within different contexts has led to some difficulty in reaching a comprehensive assimilation of the formation procedure. The approaches widely applied to the exploration and investigation of the factors which influence the adoption of e-gov and to the testing of adoption- related theories are CB-SEM or PLS-SEM. It is argued that scientifically applied approaches are not considered neutral (Gigerenzer, 1991), and that they inform thinking as well as framing theories (Woodside, 2013; Woodside Arch, 2016; Wu *et al.*, 2014). Because the issues of multicollinearity, asymmetric and nonlinear relations are unsatisfactorily dealt with when employing regression-based techniques, the power of elaboration of a particular theory or model on the basis of those techniques is often ranged as medium to low. For that reason, fsQCA may be seen as a contemporary substitute tool that could be employed to supply more subtle information. However, like any other analysis tool, it has its limitations, and these will be discussed later in the "limitations" section of the research. To the best of the researcher's knowledge, fsQCA is not currently used for research into the adoption of e-gov. Hence, this study presents the advantages of utilising both SEM and fsQCA approaches to the analysis. The former allows observation of the strength of the paths between constructs in the proposed model, whereas the latter produces configured solutions that achieve specific outcomes of the study. Each approach should be seen as complementing the other.

The findings of fsQCA reveal that three complex configurations lead to users' adoption of e-gov in KSA, with overall solution coverage = 0.86 and solution consistency = 0.95. The first configuration (1) shows that high trust toward the government, high trust toward the webpage, high ease of use of the e-gov webpage, low usefulness, low reliability perception, low complexity and social influence achieve the highest e-gov adoption via citizens in KSA. Of the three configurations, this configuration has the highest consistency of 0.98, and explains the majority of cases with raw coverage = 082. The second configuration (2) includes high trust toward government, low trust toward technology, high trust toward e-gov webpages, low ease of use, high reliability, and social influence, leading to the achievement of a high level of citizens' adoption of e-gov. This configuration has the second highest consistency = 0.96 and explains a very good number of cases, with row coverage = 0.74 of the total cases. The last configuration (3) includes high trust toward government, high trust toward technology, high trust toward e-gov webpages, high case of use, low usefulness, high compatibility and social influence.

However, this configuration has the lowest consistency = 0.92 and a good explanation but the lowest number of cases with raw coverage = 0.18.

More interesting is that all the three configurations (solution 1, solution 2 and solution 3) include three conditions, namely high trust toward government, high trust toward e-gov webpages and social influence. These findings imply that all three conditions are necessary (though not sufficient) to achieve a high level of citizens' adoption of e-gov in KSA. Furthermore, the finding revealed the important role played by the three conditions in increasing adoption by citizens. Therefore, although no single factor or condition can predict citizens' adoption, the three conditions mentioned are essential to all solutions. This also answers the question of why the adoption of the aforementioned variables, based on the combined variables, is more likely to produce a higher level of adoption than the adoption of a single variable. Surprisingly, the necessity analysis indicates that four variables are necessary, namely citizens' trust toward government, users' trust toward e-gov webpages, complexity as well as social influences. These four variables are most likely to appear in the truth table as necessary conditions in all the provided solutions. However, all of them appear in the truth table except complexity. This contradiction can occur when the condition is demised or minimised because of the acceptance of its absence to enhance parsimony (Kent, 2015).

The PLS-SEM results indicated that social influence, citizens' trust toward e-gov webpages, relative advantages, compatibility and complexity are significant antecedents of citizens' intention to adopt e-gov services, but not citizens' perception of ease of use. The results of fsQCA conditionally support the above results, especially citizens' trust toward e-gov webpage, citizens' trust toward government and social influences as three core necessary (though not sufficient) conditions. Citizens' trust toward technology and relative advantages are also conditionally supported and can be either present or absent contingent on the other combined conditions. FsCQA shows the interesting finding that, despite the significant influence of compatibility, complexity on citizens intention to adopt e-gov based on PLS-SEM analysis, their absence in two out of three solutions indicates that both conditions facilitate a high level of intentions of citizens to adopt e-Despite the conditional support of compatibility and citizens' trust toward gov. technology conditions in fsQCA to the result of PL-SEM, there is some inconsistency in the result of both techniques. The results of PLS-SEM analysis show that compatibility is the third highest antecedent to citizens' intentions. Citizens' trust toward technology is the highest antecedent of citizens' intentions through citizens' trust contingent on egov webpages. In addition, both have a significant positive relation. However, their presence (as high) in one out of three solutions that have a satisfactory consistency with lowest coverage and consistency among the three do not entirely reflect their significant and positive results in PLS-SEM. Another interesting finding is that, users' trust toward e-gov webpages is a significant antecedent of citizens' intention but the least significant among the antecedents in PLS-SEM. However, the findings from fsQCA indicate that a high level of citizens' trust toward e-gov webpages is a core necessary condition (although not a sufficient condition) in all the three intermediate solutions presented with all the different combinations of other conditions.

Surprisingly, the first and the highest consistent solutions in fsQCA with 0.98 and highest coverage 82%, which include two contradicted configurations namely, high perception of ease of use and high complexity, as an important to reach such an outcome. More interesting is that complexity has a significant and negative impact on users' intentions to adopt government in KSA. If PLS-SEM results that evaluate the isolated effect of a particular antecedent, such as complexity and its significant and negative effect, is completely followed, it could result in demands for a less complex e-gov system for achieving a high level of adoption in KSA. However, the previous fsQCA findings indicate that a complex system is not always difficult to use. This could imply that a

complex system was acceptable to citizens, as long as the system is thoroughly explained and promoted so that its facilities become easy to use. If the system is simplified too much, it would fulfil the basic needs of citizens but would soon become outdated. Citizens need a system that facilitates many day-to-day activities and saves time, money and effort. Therefore, the evaluation of the combined influence of factors which influence citizens' adoption of e-gov in KSA with fsQCA prove that a degree of complexity of the system is acceptable.

Another surprising finding from the evaluation of the combined influence of the antecedents impacting users' intentions to adopt e-gov systems is the absence of significant antecedents from two out of three solutions (S1 and S3), namely complexity and compatibility. By looking broadly at the three solutions provided in the truth table, it can be seen that the absence of relative advantages requires either complexity or compatibility to reach an outcome of a high level of citizens adoption, whereas the presence of high relative advantages with other combined configurations, with the exception of complexity and compatibility, will lead to an outcome of a high level of citizens' adoption. This is an interesting finding, as high relative advantage would compensate the influence of both compatibility and complexity.

Another interesting finding is the absence of citizens' trust toward technology in two out of three solutions in the truth table. The results of the truth table indicate that in addition to the three essential conditions, namely high trust toward government, high trust toward e-gov webpages and social influence, citizens' trust toward technology could be substituted in two ways. The substitution can occur either by high relative advantages or complexity, with high perception of ease of use. This implies that when citizens find that the adoption of e-gov helps them to perform tasks effectively and efficiently, they will be likely to adopt it, even if their trust toward the technology used is low. Secondly, citizen will be likely to adopt e-gov despite the complexity of the system, as long as the system is thoroughly explained, promoted and is able to meet most of their needs, even if they do not trust the technology used.

The results of PLS-SEM analysis show that citizens trust toward government, citizens' trust toward technology, citizen's perception of ease of use and relative advantages are significant antecedents of citizen's trust toward e-gov webpages. These results are conditionally supported by the results of fsQCA, as citizens' trust toward government is a core necessary condition (though not a sufficient condition) for high levels of citizens' trust toward e-gov webpages. However, the results show interesting findings. The absence of citizens' trust toward technology in two out of three solutions indicates that this condition facilitates a high level of citizens' trust toward e-gov webpages. Citizens' perception of ease of use can be either present or absent, contingent on the other combinations of conditions for the achievement of a high level of citizens' trust toward e-gov webpages.

The following table 6.2 summarises and compares the previous findings from the analysis of (PLS) and the combined influences resulting from the analysis of fsQCA.

Individual Influence		Combined influence			
Variables	PLS result	fsQCA result	Can Variable be substituted	Substitutions (Completely or partially substitution need to be combined with all (*) variables	
*TRUG	Significant positive influence – TRUW	A must, necessary (through not sufficient)	No	No	
TRUT	Significant positive influence – TRUW	Not necessary, but can be combined with other variables.	Yes	Completely substituted = (High EOU and COML + Low USF and RELT)	
*TRUW	Significant positive influence – INTN	A must, necessary (through not sufficient)	No	No	
USF	Not supported	Not necessary, but can be combined with Yes other variables.		Partially substituted = (High EOU and COML + Low RELT)	
				Partially substituted = (High TRUG, EOU and COMP)	
				Completely substituted = (High RELT + Low EOU and TRUT)	
EOU	Significant positive influence – TRUW	Not necessary, but can be combined with	Yes	Partially substituted = (High RELT + Low TRUT)	
	Significant positive influence - USF	other variables.			
RELT	Significant positive influence – TRUW	Not necessary, but can be combined with other variables.	Yes	Completely substituted =(High TRUT, EOU and COMP + Low USF)	
	Significant positive influence – INTN]		Partially substituted = (High EOU and COML + Low USF)	
СОМР	Significant positive influence – INTN	Not necessary, but can be combined with other variables.	Yes	Completely substituted = (High EOU and COML + Low USF and RELT)	
				Completely substituted = (High RELT + Low USF and TRUT)	
COML	Significant negative influence – INTN	Not necessary, but can be combined with other variables.	Yes	Completely substituted =(High COMP, EOU and TRUT + Low USF)	
				Completely substituted =(High RELT + Low EOU and TRUT)	
*SOCL	Significant positive influence – INTN	A must, necessary (through not sufficient)	No	No	

Table 6.2 Synopsis and Comparison of the finding of Individual influence (PLS) and Combined influence (fsQCA)

NOTE: (*) indicate all must conditions (necessary through not sufficient) in fsQCA that cannot be substituted.

6.5 Conclusion

The current chapter presented the additional discussion with regard to the results of the proposed questions. The hypothesised relationships in the model were explained and their consistency and inconsistency with the previous studies were also highlighted. The outcomes of the current research are discussed in the current chapter in an attempt to explain the factors which influence citizen' adoption of e-gov systems in KSA.

Trust toward technology, trust toward government and relative advantages are found to be highly significant antecedents for the prediction of citizens' trust toward egov webpages. Perceived ease of use is also considered a significant antecedent, but citizens give higher attention to the previous antecedents when trust is evaluated.

In addition, complexity is found to be the strongest predictor of citizens" intentions to adopt e-gov services in KSA. Trust toward government webpages is revealed to be significant, although it is the least significant among the predictors. Social influence, compatibility and relative advantages are all found to be highly significant in predicting citizens' intentions to adopt e-gov services. In contrast, perceived ease of use was found to be insignificant in prognosing users' intentions to adopt e-gov services in KSA, and thus its related hypothesis is rejected. Moreover, the important role played by culture (uncertainty avoidance) in moderating the relation between complexity, compatibility and relative advantage and users' intentions to adopt e-gov services is confirmed to be strong and needs to be considered in an evaluation of e-gov adoption.

The current chapter provided a final model of e-gov adoption in KSA from citizens' viewpoints as a product of integrating TAM, DOI and Trust and Risk models and considered social and cultural aspects that were highly predicted to explain such a phenomenon. Also, it presented the advantages of utilising both SEM and fsQCA analysis. Three solutions were presented, with three conditions that were considered essential to all solutions, namely high trust toward government, high trust toward e-gov webpages and social influences. The following chapter endeavours to synthesise the replies to the proposed research questions in accordance with the discussion and findings of the current chapter. The contributions of the present study, its implications, shortcomings and recommendations for further research are also presented in the next chapter.

CHAPTER SEVEN

CONCLUSION

7.1 Introduction

The previous chapter presented the empirical outcomes of the "WarpPLS" results with regard to the proposed research hypotheses and the findings of fsQCA with reference to previous studies, as well as to the research itself. It then presented the final research model and the conclusion.

The three final aims of the thesis are: 1. To add contributions to the knowledge of the existing literature of e-gov adoption in general, and in the context of KSA in particular. 2. To provide practical recommendations for the enhancement of the adoption of e-gov, and 3. To provide recommendations for further research. To fulfil these aims, this chapter will conclude the previous discussions and present a synthesis of the major findings of the research.

The chapter includes the main findings of the research, responses to the proposed research questions and the key features of the research. Its theoretical and practical implications are identified, its limitations are discussed and addressed, and further research directions are suggested.

7.2 Overview of the Study

The present study tested the proposed model in Figure 3.7 and its hypothesised relationships among the variables. These variables are listed in Table 4.3. They are 'trust toward government', 'trust toward technology', 'trust toward e-gov webpages', 'perception of ease of use', 'perception of usefulness', 'relative advantages', 'compatibility', 'complexity', 'social influence', 'intention to use e-gov' and 'culture' (uncertainty avoidance). A "Structural equation modelling" analysis software package

""WarpPLS"" and Fuzzy Set Qualitative Comparative Analysis (fsQCA) were used to statistically analyse paths in the model, complementarity and interdependent relationships that exist between the variables. "WarpPLS" application was particularly geared toward examining nonlinear links among variables. By using such modelling tools, (PLS) "Partial Least Squares" has several advantages, such as its ability to handle very complex models. Many variables and relationships, loadings, standardized regression coefficients, and R² for the entire endogenous constructs can be produced easily and clearly (Hair *et al.*, 2016). Also, in terms of data distribution, the software provides the researcher with relaxed assumptions (Hair, 2013). According to Kock (2012), and by performing linear and non-linear regression analysis, "WarpPLS" has the ability to identify non-linear relationships among variables. For fsQCA, complex causal patterns between the variables of a model can be investigated by examining a small number of cases. It also goes beyond that by analysing the influence of the models' variable on an outcome to the investigate all feasible interaction among them.

An online survey has been used in the present study to reach the users of e-gov. The expansion of the Internet makes it an efficient means for the researcher interested in online activities to reach a high volume of the targeted population (Agag and El-Masry, 2016a). The Qualtrics online survey platform (www.qualtrics.com), one of the leading companies in the top right quadrant, was used to collect data. The sample was selected from KSA. The independent variables in the theorised model are 'trust toward government', 'trust toward technology,' 'social influences', 'relative advantages', 'compatibility', complexity' and 'perceptions of ease of use'. The intervening or mediating variables in the theorised model are 'trust toward e-gov webpages' and 'perceptions of usefulness'. The culture variable is the Hofstede culture dimension (uncertainty avoidance) which moderates the relation between the variables ('relative advantages', 'compatibility' and 'complexity'), and the main latent variable, 'intention

to adopt e-gov'. Finally, the main dependent variable in the theoretical model is 'intentions to use e-gov'.

To address the missing data prior to the analysis, a Listwise Deletion (LD) approach was used. This method deleted all the data rows that contained missing data elements. As suggested by Hair (1998), missing data of all variables in the theoretical model were within the 10% threshold. Out of the 660 responses, 30 were missing. Therefore, 30 were excluded. On average, this accounts for approximately 4% of all responses.

Multicollinearity analysis of the data was performed. According to Kock (2012), the increase in multicollinearity might be a result of the high correlation coefficient among variables in the model. Therefore, multicollinearity is likely to be a sign of high correlation coefficients between two or more variables. As pointed out by Douglass *et al.* (2003), the increase in multicollinearity is not a conclusive result of high correlation coefficients among variables, but the latter are conflated with collinearity. Thus, the data has been tested with a full collinearity test. As recommended by Hair (1998), the threshold of the Variance Inflated Factor is VIF=5. Based on this recommendation, there was no multicollinearity in the tested data.

An SPSS statistical software package was used to generate the descriptive statistical data. "WarpPLS" was used to analyse and test non-linear relationship in the hypothesised relationship between variables presented in the theoretical model. The results of the tested hypotheses are presented in Table 5.9. The other results of data analysis, including fsQCA, were explained in Chapter 5. One of the 12 hypothesised relationship was rejected, and 11 were accepted. The hypothesis of perceived usefulness of the intentions to adopt e-gov adoption has not been substantiated. In Chapter 5, there is a synopsis of all the standardised coefficients from the estimated model along with the p-value. The results of the fsQCA were also presented in Chapter 5, revealing three

solutions that could increase citizens' adoption of e-gov in KSA. Three conditions were also revealed as essential to all the proposed solutions. The findings from these statistical analysis techniques, namely "WarpPLS" and fsQCA, were discussed in Chapter 6. All the 12 proposed hypotheses are discussed separately, with a final presentation of the proposed research model.

Finally, the current chapter, Chapter 7, will conclude the previous discussions and present a synthesis of the major findings of the current research. The chapter also includes responses to the proposed research questions, and the key features of the research are discussed. Response to the findings of the literature review that was conducted will be included to see ways they were addressed in this research. Theoretical and practical implications are identified, and lastly the shortcomings of the present study are discussed and addressed, and further research directions are suggested.

7.2.1 The Research Gap and Research Questions

Advances in Information and Communication Technology (ICT) have dramatically transformed the ways that individuals, businesses and governments communicate and interact with each other. The egress of the Internet has compelled governments to enhance the mechanism of interacting with the public, and this has led to the creation of an e-society. With the rapid development of technology, e-gov has become more than a means of providing services to citizens, organisations, businesses or other government departments. It is a revolutionary shift in societies, and thus e-gov and its practical applications have inspired much debate. Despite the capacity of e-gov to change societies dramatically, many developed and less advanced nations are facing challenges that hinder its adoption. This is often attributable to a misunderstanding of research findings, and the mistaken belief that lessons learned in one context can be applied globally. Each country has its own unique context, despite a few similarities that some of them share. For this reason, the implementation of e-gov applying a single universal approach in every case leads to ineffective attempts at implementation. With its '2030 Vision' and the dramatic changes that are now under way, KSA is eager to improve and enhance the use of e-gov. The country has plans to reduce its dependency on oil resources, to diversify the economy and cut costs, and to improve governmental services for all beneficiaries including citizens, businesses and governmental institutions themselves. Despite the high investment in these plans, the results on the ground have not been satisfactory. For e-gov benefits to be recognised and realised, the rate of e-gov adoption needs to increase. Therefore, KSA needs plans and strategies that consider its unique context in order to enable e-gov to fulfil its great potential.

The literature review of e-gov adoption revealed that the influence of culture has received little attention. Two cultural comparison studies between two less advanced nations, the Britain and the America were conducted by Carter and Weerakkody (2008), and another comparative study of an advanced nation (the United Kingdom) and a less advanced nation (Sri Lanka) was conducted by Ali, Weerakkody and El-Haddadeh (2009). The findings of these studies indicated that differences in culture have an effect on the adoption of e-gov. Another study by Arslan (2009) investigated the influence of culture in some European countries. A global comparison study was conducted by Khalil (2011) to detect the impact of cultural aspects on the predisposition to implement e-gov systems. According to Zhao (2011), all these e-gov studies utilised Hofstede five culture-dimensions. Seng, Jackson and Philip (2010) used the Grid and Group Cultural Theory of Mary Douglas to identify factors which enable or hinder the adoption of e-gov. The findings of their study indicated that cosmology-hierarchism, individualism, egalitarianism and acceptance of the inevitable affected the application of e-gov in the context of Malaysia.

Chatfield and Alhujran (2009) performed an e-gov comparison studies between advanced nations and Arab nations as well as a comparison among those Arab nations. The study found that there was a huge gap in the level of access to contemporaneous technologies between advanced nations and Arab nations, as well as among those Arab nations themselves. However, insufficient focus has so far been paid to the effect of cultural aspects on individuals' adoption of e-gov in the context of Arabic nations. For this purpose, the current study has attempted to overcome this gap by examining the cultural impact of citizen' adoption of e-gov in the context of KSA, together with consideration of related social factors.

Moreover, in the review of the existing literature, only a small number of studies have focused on the identification of the factors that influence the adoption of e-gov in less advanced nations, such as KSA, from a citizens' perspective. Studies that were conducted in KSA are in many respects limited and were discussed in Chapter 2. One might assume that findings from studies conducted either in advanced nations or less advanced nations that share some characteristics with KSA could produce generalisations that also apply to KSA. The existence of certain similarities to other countries, for example, of language or religion could result in wrong conclusions and the implementation of ineffective practices. An issue could be highly significant in one country but not in another. A recent study that investigated e-gov adoption in two less advanced nations with many similar characteristics, the United Kingdom and the United States, indicated that there are differences with regard to the factors that influence citizens' adoption of e-gov (Carter *et al.*, 2016).

Furthermore, existing publications of e-gov adoption in the literature either focus on the main influence of specific predictors of intention to use e-gov services (e.g. perceived usefulness, perceived ease of use), or fail to examine their combined influence. By doing so, these studies ignore the complementarity and interdependent relations of those predictors on users' intentions to use e-gov services. Most important is how a combination of those predictors offer a better explanation of citizens' intentions. Therefore, this research, instead of exploring only the causal patterns of the factors that impact adoption of e-gov by individuals, attempts also to explain how these factors combine and lead to an increased level of adoption. Thus, the current study attempts to identify configurations that elucidate e-gov adoption by citizens. These configurations help in understanding the detailed patterns of factors that increase the level of adoption.

Hence, in an effort to response to the aforementioned gap in the empirical literature, the current work has presented and examined a conceptualised model which identifies the factors which impact the adoption of e-gov from the citizens standpoint by examining psychological aspects, such as perceptions of usefulness, perceptions of ease of use, and technical aspects, such as relative advantages, compatibility and complexity, and social influences. It also explores the moderating role of cultural and societal manifestations in KSA, in accordance with Hofstede's culture dimension ('uncertainty avoidance') on the links between relative advantages, compatibility and complexity and users' intentions to use e-gov systems. Furthermore, the current research utilises the model of trust and risks ('trust toward technology', 'trust toward government' and 'trust toward e-gov webpages') to examine the stimulating variables which affect users' adoption of e-gov.

Alongside this model, research questions have been proposed to address the identified gap in the literature of e-gov adoption. To link the findings of the study with the research findings, it might be helpful to recall those questions:

RQ1. What are the factors affecting e-gov adoption in the context of KSA?

RQ2. To what extent dose culture (Uncertainty avoidance) influence e-gov adoption in KSA context?

RQ3. What are the configurations which lead to an increase in the adoption of e-gov in KSA?

To answer these questions and the proposed hypotheses, the following objectives are set:

- > To understand the existing state of e-gov in general, and in KSA in particular.
- To propose, in terms of the existing literature, a conceptualised model which compasses the catalytic factors that impact the adoption of e-gov with reference to the viewpoints of citizens.
- Utilising a methodological design, method and analytical technique that help answering research questions and help evaluating and validating the proposed model in the context of KSA and identify other alternative recipes to that model.
- To add contributions to the existing literature of e-gov adoption in general, and of KSA in particular.
- > To provide practical recommendations to enhance the adoption of e-gov.
- To identify the implications of the study and to recommend further areas of research.
- > Provide study implications and recommendations for further research.

7.3 Research Findings

The following is a synopsis of the prime outcomes obtained from the systematically performed review of the existing literature and the current empirical research. This synopsis also includes responses to the proposed research questions in Chapter 1.
7.3.1 Finding that Response to the First Question "RQ1. What are the factors affecting e-gov adoption in the context KSA?"

- Several issues related to organisations, technology and society that affect governments in the transformation from the conventional way of transacting, interacting and enquiring information by their citizens to e-gov systems were discussed and identified in Chapter 2. This chapter also identified the prime factors which prevent or encourage the use of e-gov in KSA. These factors include the '2030 Vision' programme; gender segregation; the fact that KSA receives 2.25 billion Muslims for the Hajj and Omrah (pilgrims); the fact that KSA is one of the ten hottest countries in the world; that it is, one of the G20 countries; is 13th largest country in the world; and the government's decision to open the country to tourism for the first time. These factors could be considered as strong drivers for the implementation of an e-gov system. On the other hand, the existing literature indicates that there are several factors that could delay or prevent the implantation of such a system in KSA. These factors are mostly related to society, organisations and technology. For example, trust, cultural norms, a weak consolidated infrastructure, a slow restructuring procedure, insufficient policies and regulation and citizens' IT/IS related skills, are some of the issues that hinder the adoption of e-gov in KSA.
- The current research aims to develop a conceptualized model that holds the stimulus factors influencing the adoption and use of e-gov system by citizens as end users in KSA. Several theories and models derived from different perspectives are explored and further developed. Consequently, there has been an integration of TAM, DOI, Trust and Risk Model to form a suitable model which could better explain citizen' adoption of e-gov systems in KSA. To strengthen the model's explanation of citizens' adoption, a culture dimension (uncertainty avoidance) has been added as a moderator between DOI constructs the and intentions to adopt e-gov services. Social influence

is also added to improve understanding of the phenomenon (See Chapters 2 and 3, which deal with the first question in the current research).

- The analysis revealed that trust toward government and trust toward technology as antecedents of trust toward e-gov webpages are separately loaded. Perceived usefulness and relative advantages are also loaded separately. Despite the significant influence of relative advantages, perceived usefulness shows no influence on users' intentions to adopt e-gov system in KSA. Therefore, it has been dropped from the final proposed model.
- The result of regression analysis revealed that trust toward government, trust toward technology, relative advantages and perceived ease of use are significant antecedents that positively influence citizens' trust toward e-gov webpages. They successfully explained 29% of the variance with R²=0.29, which is a significant contribution to the result.
- The result of regression analysis revealed that social influence, trust toward e-gov webpages, relative advantages, and compatibility positively and significantly impact citizens' intention as end users of an e-gov system. However, complexity negatively and significantly affected their intention to adopt the system. These factors successfully explained 81% of the dependent variable variance (intention to adopt e-gov system) with R²=0.81 which is a significant contribution to the result of the research.
- The results of the regression analysis also revealed that there is no correlation between perceived usefulness and citizens' intention to adopt e-gov systems. Surprisingly, perceived usefulness is considered an important factor that determines users' acceptance of technology. This implies that Saudi e-gov users can differentiate and clearly see the extra advantages of e-gov services over the conventional way, as the correlation of relative advantages with citizens' intentions is supported. However,

citizens could lack confidence in their ability to perform the required tasks. Perceived usefulness needs to be further developed, for example, by using performance expectancy in its place. Perceived usefulness was therefore removed.

- The crucial role played by trust is revealed in the result of the current research. Both trust toward government and trust toward technology are confirmed to be strong antecedents of citizens' trust toward e-gov webpages. Furthermore, the significant influence of trust toward e-gov webpage on citizens' intention to adopt e-gov system is also noted since Saudi culture is characterised with a high value of uncertainty avoidance.
- The results of this study also shed light on the positive and significant correlation between relative advantages and citizens' trust toward e-gov webpages. To the best of the researcher's knowledge, this relation has not been previously explored, and is therefore a significant contribution to the results.

7.3.2 Finding that Response to the Second Question " To what extent dose culture (Uncertainty avoidance) influence e-gov adoption in KSA context?"

The result of this study also revealed that culture differences, even among citizens themselves contribute significantly in impacting the adoption of e-gov. This can be observed from the revealed moderation of uncertainty avoidance on the relation between relative advantages, complexity and compatibility and intention to use egov. These differences are more likely to affect citizen's adoption of e-gov. It is therefore implied that, in the process of promoting e-gov in KSA, addressing culture issues would help to make e-gov systems more compatible, less complex and make its relative advantages more apparent. The findings of this research also revealed that citizens characterised by a strong tendency to avoid uncertainty are less likely to adopt e-gov. They are more likely to prefer conventional ways of performing transactions and interactions with the government when they are available and working in parallel with an e-gov system. It is predictable that such personalities regard the conventional methods as more advantageous, highly compatible and less complex because those methods contain less uncertainty, whereas, citizens with a low extent of uncertainty have higher of adopting e-gov.

7.3.3 Finding that Response to the Third Question "What are the configurations which lead to an increase in the adoption of e-gov in KSA?"

- The result of the Fuzzy Set Qualitative Comparative Analysis revealed the importance of configurations that could increase the rate of adoption. Also, it revealed the importance of combined influences, and the complementarity and interdependent relations of those predictors on citizens' intention to use e-gov services. More importantly, the results show that combinations of those predictors better explain citizens' intentions. To the best of the researcher's knowledge, the current study is the first to successfully address this issue, especially in the context of KSA. Therefore, this study concludes that no single factor or condition can predict citizens' adoption. Instead, three conditions, high trust toward government, high trust toward e-gov webpages and social influence are necessary though not sufficient for all solutions. The study also finds that the adoption than the adoption of a single variable.
- In general, trust toward e-gov, trust toward e-gov webpages and social influence are essential conditions for the achievement of a high rate of e-gov adoption. All other

variables can be partly or completely substituted on the basis of a combination of the three essential conditions that were identified, and other variables.

- Despite the significant and positive influence of trust toward technology, it can be substituted in two ways. The substitution can be either partial, by means of 'low ease of use' + 'high relative advantages, or complete ('high ease of use' and 'complexity' + 'low usefulness and 'relative advantages').
- Despite the unsupported link between usefulness and the adoption of e-gov, its influence combined with all necessary conditions and other selected variables in fsQCA plays an important role that cannot be ignored and can lead to high adoption of e-gov in KSA. It can also help in substituting other variables, either partially or completely, based on combined conditions, such as trust toward government, relative advantages, compatibility and complexity. It can also be substituted either partially (by low ease of use + high relative advantages), or completely, (by high ease of use and complexity + low usefulness and relative advantages).
- Despite the significant and positive influence of ease of use on trust toward e-gov webpages and on usefulness, it can be only partially substituted by high relative advantages and low trust toward technology.
- Despite the significant and positive influence of relative advantages on adoption and trust toward government webpages, it can be substituted in two ways. The substitution can be either partial, (by high ease of use and complexity + low usefulness) or completely, (by high trust toward technology, ease of use and compatibility + low usefulness).
- Despite the significant and positive influence of compatibility on adoption, it can be completely substituted in two ways. The substitution can be either by a high level of ease of use and complexity + low usefulness and relative advantages, or by high relative advantages + low usefulness and trust toward technology.

- Despite the significant and negative influence of complexity on adoption, it can be completely substituted in two ways. The substitution can be either by high compatibility, ease of use and trust toward technology + low usefulness or by high relative advantages + low ease of use and trust toward technology.
- According to the fsQCA findings, the perception of high relative advantages would compensate for the influence of both compatibility and complexity.
- According to the fsQCA findings, complex systems do not always mean it is difficult to use. This implies that a complex system could be acceptable to citizens, provided that it is well explained and well promoted.

7.3.4 Responses to the Evaluation of the Conducted Review of the Existing Literature of e-gov Adoption in Chapter 2 Section 2.10:

In Chapter 2 Section 2.10, several limitations were found in previous studies of e-gov adoption. Eight issues were found to have generally limited some previous studies and four issues were found to have limited the generalisability of those studies. The current study attempts to cover these issues. The eight general issues and the four generalisability issues have been addressed. However, due to the researcher's inability to gain a sample framework for citizens who previously used e-gov in KSA, it is not easy to generalise the findings, despite the four issues of generalisability that have been addressed. It would be useful to recall those issues again and to respond to each one of them. Table 7.1 below presents the issues in respect to Section 2.10:

No	Issue	Response
General issues		
1	On the basis of the reviewed literature, there are a limited number of studies that have investigated the adoption of e-gov in the context of KSA.	The response of this study is a study conducted in KSA.

Table 7.1 Responses to the assessment of the e-gov literature

2	Many limitations to the few studies conducted in KSA have been noted, such as concentration on a particular type of service within e-gov systems, or on specific groups, such as a single gender, or by the collection of a particular type of data from a specific city e.g. Choudrie, Alfalah and Spencer (2017) and Weerakkody <i>et</i> <i>al.</i> (2013). However, e-gov in KSA covers a wide area and provides various services for different beneficiaries, such as male and female. Especially since '2030 Vision' there have been innovations with regard to females, such as allowing women to drive. Gender segregation, religious issues, and the tribal system could affect e-gov adoption, especially with regard to women. Therefore, diversifying the targeted sample and collecting data from a wider area could bring more realistic and reliable results.	This study investigated the current system, which provides several services to a wider population, including both males and females, in accordance with the Saudi '2030 Vision'. The results are be more realistic and more reliable than those of previous studies.
3	Another issue is that some studies examined an e-gov system that had not yet been inaugurated at the time of the study: the targeted sample was questioned on the basis based of their perception of a point of time in the future (e.g. Hamner and Al-Qahtani (2009). Also, only a few factors which might impact the adoption of e-gov were used and the targeted sample was selected from one city. Many factors which impact the adoption of e-gov, especially technical factors, require a practical use of the system in order to gather more realistic answers to the issues investigated.	The current study examined the system that is currently used by citizens in KSA. so that the result can reflect the real use of those citizens, especially with regard to technical issues.
4	Several studies conducted in KSA do not have empirical validation of their model (e.g. Alshehri, Drew and Alfarraj (2012) and Alateyah, Crowder and Wills (2013).	This study validated the model in the context of KSA by collecting responses from citizens and analysing data accordingly.
5	Based on the existing literature and to the best of the researcher's knowledge, most e-gov adoption studies have emphasised the direct influence of the factors affecting intention to use. Yet many contradictory and inconsistent results exist in the literature e.g. Alomari (2014); Alsaif (2014); Carter <i>et al.</i> (2016); Choudrie, Alfalah and Spencer (2017); Venkatesh <i>et al.</i> (2003a). Therefore, indirect and internal relationships between those factors need to be further investigated to better understand such contradictions.	This study was the first to utilise fsQCA with SEM The latter allows the observation of strength of the paths between constructs in the proposed model, whereas the former produces configured solutions that achieve specific outcomes, and investigates the combine

		influence, the complementarity and interdependent relations of those predictors of citizens' intentions to use e-gov services. The study additionally focused on the direct and indirect influence of those factors such as trust toward e-gov webpages)) that mediated the relationship between trust toward the government, trust toward technology, relative advantages and perceptions of ease of use and citizens' intentions to adopt e-gov. Also, the study examined the impact of perceptions of ease of use on citizens' intentions through perceived usefulness as well as the moderating role of culture (uncertainty avoidance) on the relationship between relative advantages, compatibility, complexity and intention to adopt.
6	Despite the call to diversify the methodological and analytical approach in order to uncover the complex relationship between variables that lead to technology adoption (Bagozzi, 2007; Pappas, Giannakos and Sampson, 2017; Pappas <i>et al.</i> , 2017), the majority of the studies in the literature have employed either Covariance Based Technique (CB-SEM) or Partial Least Square (PLS-SEM). Both techniques presuppose symmetric relationships between the studied variables (O'Donohue, 2016; Woodside, 2014; Woodside, 2017). Therefore, more investigation needs to be done.	Fuzzy Set Qualitative Comparative Analysis was used with PLS-SEM.
7	Majority of the studies that studied culture employed Hofstede measures (Khalil, 2011), which are designed to be conducted on a national level, not to measure individuals. Some of them used predefined scores for each	Individual culture orientation is measured in accordance with (Yoo, Donthu and Lenartowicz, 2011)

	country to study the effect of culture (Ali, Weerakkody and El-Haddadeh, 2009; Arslan, 2009; Seng, Jackson and Philip, 2010; Zhao, 2011). However, the former approach could not work. Hofstede and many other studies warned about such applications (Bearden, Money and Nevins, 2006; Blodgett, Bakir and Rose, 2008). The approach could give rise to issues where a particular context consists of a heterogeneous population with multi-cultural aspects (Yoo and Donthu, 2015). Therefore, it is important that further investigation uses a scale that is validated at an individual level to see the actual culture orientation for citizens.	
8	Several studies in the developed countries indicated that the reluctance of using e-gov can be resulted from the low level of trust in government and technology. Despite that, few studies have examined the influence of trust in government and technology in the context of KSA e.g. Weerakkody <i>et al.</i> (2013), and some of these studies have not empirically validated their findings e.g. Alateyah, Crowder and Wills (2013). Other studies have focused on a particular area, service or group of people e.g. Choudrie, Alfalah and Spencer (2017) and Alharbi, Papadaki and Dowland (2017). KSA is a big countries that equivalent in size of the sum of Italy, Spain, Sweden, United Kingdom, France and Portugal. Many tribes, which speak, eat and live differently, are located in different areas in KSA. Attitudes that are acceptable in one are or tribe could be unacceptable in the others. Even words that is acceptable in one area could be not in the other. Some cities are westernized such as Jeddah, Riyadh and Dammam and many others, and some preserve a conservative culture. Several studies proved that trust in government or technology can be different between countries that share similar characteristic e.g. Carter et al. (2016). Even the influence of trust in government and trust in technology can be different between groups who live at the same countries e.g. Carter and Belanger (2004b) and Carter and Bélanger (2005a). This is particularly important as e-gov in KSA still considered as a new system and the conventional way (face to face) is still working in parallel with it. This in turn will more likely	This has been achieved by empirically investigated and validated the influence of trust in government and trust in technology as an antecedent to trust in e- gov websites. The latter influence in citizens intention to adopt e-gov has been also examined and empirically validated.

	to make individual make evaluation between both based on the most trustworthiness approach. Therefore, trust in government and trust in technology need to be empirically investigated with a representative sample that could reflect and produce more meaningful findings.	
	Generalisability issues	
a	The limited ability of generalizing the findings of those studies is due to the limited size of the targeted population e.g. Lin, Fofanah and Liang (2011) and Horst, Kuttschreuter and Gutteling (2007).	This study targeted a wide area of KSA with 630 usable questionnaires to conduct the analysis and to validate the model. There are disagreements over what is to be considered a big sample. However, in accordance with the recommendations in the literature, rule of thumb and GPower software together generated the appropriate sample size, and the size of the study sample can be considered as large.
b	Each country has its own context in respect to several features, such as technology infrastructure, financial issues and traditions etc. Many of the studies conducted in developed or less advanced nations are based on the stage and the level of advancement or stage of maturity achieved by those countries e.g. Dwivedi <i>et al.</i> (2017), Voutinioti (2013), Seo and Bernsen (2016) and Sharma and Mishra (2017). The findings of Carter <i>et al.</i> (2016), discussed previously in the literature, proved that differences in the adoption of e-gov and those factors affecting it are evident not only in the context of different countries, but also among citizens who live in a different area of the same country. More interesting is that some of the conducted studies validating an identical model in the same country produced different results due to changing the sample from students to ordinary citizens e.g. Carter and Bélanger (2005a) and Carter and Belanger (2004a). KSA has its own context that needs to be investigated accordingly.	The current study conducted in KSA considered the recent technology infrastructure and the level of maturity of the government.

c	Several studies are limited in their samples in respect of their size and the groups targeted. Consequently, there could be issues over the representativeness of the population that actually uses e-gov. Many of these studies mainly targeted students e.g. Carter and Belanger (2005) and Teo, Srivastava and Jiang (2008).	The study did not target a particular group, such as elderly, the young or individuals who benefit from a particular service. The study covered a wide area and different cities in KSA and the sample included participants from different levels of education, age and background and both men and women.
d	Despite the similarities between some of the countries in the adoption studies e.g. (language, ICT advancement, maturity level etc.), it is obvious from the existing literature and the proposed models that each country has its own context that needs to be considered.	The study examined and tested the model according to the perspective of Saudi citizens.

7.4 Research's Contributions

The current research has made significant contributions to the field of e-gov and other similar contexts. These contributions are relevant to academia and to decisionmakers in government. The next sections include explanations of the practical and theoretical implications of these contributions.

7.4.1 Theoretical contributions

As far as the authors knows, this is the first study to investigate the factors which impact the adoption of e-gov from citizens' standpoints by examining trust toward technology and trust toward government as antecedents of trust toward in e-gov webpages, which in turn influence citizens' intention to adopt e-gov. Furthermore, as far as is known, this is the first study to investigate the link between relative advantages and citizens' trust toward e-gov webpages. The outcomes show that trust toward technology, trust toward government and relative advantages are strong determinants of citizens' trust toward e-gov webpages and these factors successfully explained 29% of the variance. This will assist other researchers to examine additional factors to validate the antecedents of citizens' trust toward e-gov webpages that already have been investigated in this research into other e-gov studies in different context.

Moreover, this research supplements the literature of e-gov adoption by presenting conditions for e-gov adoption behaviour. Previous studies in the existing literature have explained citizens' adoption of e-gov by analysing various technical, social, organisational and psychological antecedents (Al-Hujran *et al.*, 2015; Alharbi, Papadaki and Dowland, 2017; Alsulaimani, 2018; Carter and Bélanger, 2005a; Carter *et al.*, 2016; Choudrie, Alfalah and Spencer, 2017; Weerakkody *et al.*, 2013). However, those studies used SEM and multiple regression analysis and concentrated on finding the prime effect of several antecedents on one or more dependent variables. This issue limits those studies as a result of their neglect of the interdependent causal structure between the model constructs. This research draws from complexity theory by following a configurational approach towards citizens' adoption of e-gov and contributes to the literature by demonstrating how sets of causal conditions combine to produce configurations that impact on citizens' adoption of an e-gov system. Furthermore, this research provides a better understanding of those specific patterns of the adoption behaviour that increase the rate at which citizens adopt e-gov.

7.4.2 Methodological contribution:

To the best of the researcher's knowledge, this research is the first to present from a methodological point of view the advantages of utilising both SEM and fsQCA analysis approaches in e-gov adoption literature, especially in KSA. This study is the first to investigate causal patterns of the factors which impact the adoption of e-gov from citizens' standpoints, and goes further by investigating the combined influence, the complementarity and interdependent relations of those predictors, employing Fuzzy Set Qualitative Comparative Analysis (fsQCA). An important aspect is how combinations of those predictors are better at explaining citizens' intentions to adopt e-gov systems. The study is the first to investigate the way these factors combine to increase adoption. Several configurations that elucidate e-gov adoption by citizens are identified. These configurations help a comprehensively understanding of the detailed patterns of factors that increase citizens' adoption to e-gov. This facilitates the work of other researchers who investigate the combined influence, the complementarity and interdependent relations of factors which impact the adoption of e-gov in divers contexts, applications and fields.

7.4.3 Practical Implications:

The results of this research indicate the factors which impact users' adoption of e-gov by examining the role played by trust and culture in KSA. Therefore, decision makers could benefit from the findings of the research in an attempt to understand the phenomenon and to increase the adoption rate of citizens by addressing issues related to the factors that have been studied. In addition, decision makers could benefit from the configuration of the combined influence of those factors to effectively increase adoption. These configurations could help them to know the ranked importance of each factor, and also to better understand the importance of combining those that are highly complementary to each other. Furthermore, with the increase intention to effectively and efficiently allocate country valuable resources, these configurations could be highly useful for management to understand where the focus should be to increase citizens adoption rather than wasting those resources that could be useful to be invested in other area of improvement.

A well designed and adopted e-gov system in KSA could definitely facilitate directly and indirectly the transformation that is happening in KSA in term of its 2030 vision of reducing the dependency on the oil revenue and diversifying the economy's income to other resources such as tourism. KSA has revealed an archaeological treasure of Al-Ula and full of remains from different times and signs of different eras of local history that have not been touched or altered by anyone and unknown to the rest of the world (France24, 2018). This is clear from the French archaeologist "Jamie Quartermain" who said that this was an undiscovered remarkable jewel of archaeological discoveries (France24, 2018). Apart from that, between 2.5 to 3.0 million individuals visit KSA yearly to conduct one of the five pillars of Islam "Hajj" and between 19.1 to 20.0 million individual also visit KSA yearly for Umrah (SGAS, 2019). In addition, the foreign workers who are living in KSA count for 40% out of 34.2 million of the population (AAWSAT, 2019). KSA is also a wealthy country and it can globally plays an important role in drying the sources of financial support of those terrorist organizations that work under cover of humanitarian organization (Wilson, 2019). Therefore, this huge number of non-Saudi citizens who came to the country every year or work there, need a welldeveloped e-government system that can monitor, serve and facilitate all the processes that are required by government and ease those tourists and worker routines. A recent step in 2019 by the government to achieve the 2030 vision has been introduced which will include non-Saudi to use the system. Another step towards this goal was also introduced at the beginning of 2020 by offering an e-visa for people who wanted to come and visit the country. With a well-developed and a well adopted e-gov system, such government goals could be easily achieved.

7.4.3.1 Strengthen Trust with Citizens

According to the finding of the SEM analysis, trust toward government and trust toward technology are significant antecedents of trust toward e-gov webpages, which in turn significantly influence citizens' intentions to adopt e-gov. Both trust toward government and trust toward technology indirectly impact citizens' adoption, whereas, trust toward e-gov webpages directly impact citizens' adoption. Moreover, perceived ease of use and relative advantages have an indirect effect though citizens trust toward e-gov webpages. The findings of Fuzzy Set Qualitative Comparative Analysis revealed an interesting result, as a high level of citizens' trust toward government and a high level of citizens' trust toward e-gov webpage are essential conditions of all three proposed configurations or solutions for the achievement of a high rate of e-gov adoption in KSA.

On the basis of the previous discussion, decision makers need to ensure that government webpages are trustworthy and dependable channels that permit interactions, transactions and requests for information that are safe and secure. Government institutions need to assure the public that they are able to deliver the appropriate services online. This could be done by employing various media outlets, such as social media and short television advertisements.

Decision makers also need to ensure that building a webpage is not based on technological aspects alone. There are important social aspects to consider and citizens need their government employees to behave according to their expectations and in a socially responsible manner. Managers need to convince citizens that the stringent controls exercised over conventional government transactions is as efficient or even more efficient in the practices of e-gov. Citizens' fear of potential manipulation by government employees could best be overcome by targeting particular categories of the population, for example, those who are more willing to trust and to take risks and those who already have technological awareness and knowledge. Then, with an increase in the number of successful cases of e-gov adoption, oral messages could be employed to promote public awareness. This measure could be combined with improvements to governmental institutions by using social media and other channels to reinforce the measures previously suggested.

These recommendations are more likely to have successful outcomes if decision makers ensure that the services provided exceed the benefits to be gained from the conventional means of interacting with government. With the recent extensive use of social media applications and platforms such as Twitter, Snapchat and WhatsApp, positive experiences could be shared and disseminated quickly. Consequently, even citizens who do not use such applications or platforms could be strongly affected by favourable word-of- mouth reports from those who use these media.

On the basis of the fsQCA findings, the government needs to give attention to trust, especially trust toward government and trust toward e-gov webpages. Because these are necessary through not sufficient to increase the adoption of e-gov and cannot be substituted. However, if individuals do not trust technology, the government could overcome such a factor by significantly focusing on increasing the ease of use of the system and its compatibility with individual life styles, even when perceptions of the usefulness of the system and its relative advantages are at a low level. If individuals have a low level of trust toward technology, governments can overcome the lack of trust by emphasising the advantages and usefulness of e-gov in people's daily activities.

Apart from the previous recommendations, it is evident that high use of social media platforms in KSA is difficult to be a measure of e-readiness, but such indicator is difficult as well to be ignored in such a context. Logically, the majority of e-gov services are text-based services, thus the influence of trust cannot be isolated from the influence of the rate of literacy where citizens need to read and write with understanding of the services to be completed. Also, the influence of trust in the context of e-gov is difficult to be isolated from the influence of computer and information literacy where citizens need to be able to use their computer, smartphone or tablet as a means that enable them to conduct e-gov services. Therefore, the effort towards strengthening citizens' trust in government and trust in technology could be less effective when there are no true investments mainly in the education system (Alateyah, Crowder and Wills, 2013). Based on the UNESCO (2018), literacy rate in KSA of citizens aged between 15-24 have increased 80% to 99.3% between 1990 to 2017. For those citizen aged from 65 and above, the literacy rate increased from 3% to 62.45% between 1990 to 2017. Another report of e-government survey published by United-Nations (2018) confirmed that 60% of the citizens in KSA were online with a significant increase in e-literacy. Furthermore, the report indicateed the use of social media by Gulf Countries including KSA is one of the highest globally. The numbers are quite promising but more effort need to be done for promising results to be realized on the ground.

In less advanced nations such as KSA, unskilled and unqualified government employees with lack of technical experties have proved to be a significant hindrance to the operation of new projects that require the use of new technology (Goings, Young and Hendry, 2003). ICT skills are of two kinds, namely computer related skills and IS related skills. Computer related skills are the skills and knowledge required to operate computers. Several studies have confirmend that poor IT skills among end-users is one of the main obstacles to the use of e-gov (Choi *et al.*, 2016; Odat, 2012). Some skills related to information security are normally necessary for the use of e-gov by end users. The acquisition of such skills would make an important contribution in creating confidence in the use of e-gov systems (Liu and Carter, 2018).

7.4.3.2 Enhance Citizens' Perception of the Relative Advantages and the Ease of Use of the e-gov System.

Based on the findings, relative advantages significantly affect citizens' trust toward e-gov webpages and have a direct and indirect significant influence on citizens' adoption of e-gov services. Therefore, it is crucial to increase citizens' perception of the system's relative advantages compared to the conventional ways of dealing with government. Managers can achieve this through continuous assessment of issues that make citizens realise the difference between using online government services and the conventional method (i.e., one to one interaction). When the relative advantages are experienced as either below or the same as the conventional way, citizens will in all probability follow their usual practice i.e., dealing with government using the familiar methods. In order for the advantages of online interactions to be realised, they need to be highlighted, shared and disseminated, using the kinds of social media mentioned previously. There could be short tutorial videos that demonstrate the difficulties and disadvantages of offline government, such as the extra cost of transportation, parking, queuing and the restricted working hours of government offices. Solutions then can be demonstrated in order to make citizens realise the advantages of using online resources that allow them to avoid all these difficulties.

Despite the significant influence of 'relative advantages' and 'ease of use', the decision makers can overcome their influence as they are not necessity and can be substituted on the basis of the finding of fsQCA. If the perception of ease of use is low in respect of e-gov systems, increasing the perception of e-gov's relative advantages to citizens daily life activities should be given attention. If citizens have no perception of the relative advantages of e-gov, decision makers need to focus on increasing citizens' trust toward technology, perception of ease of use and compatibility, with attention paid to the usefulness of e-gov. However, if individuals perceive the relative advantages of the system (low), the decision makers will be able to overcome such issue by significantly enhance users' perceptions of ease of use, and complexity with attention to the usefulness of the system. Complexity in this context means that the system needs to perform many tasks and not simply one, so that citizens can receive high levels of benefit. However there needs to be well presented, well informed guidance as to how these tasks can be performed, in order that they become easy to use.

7.4.3.3 Recommendation Regarding Social Influence and Culture

The research has discovered that social influence is the second strongest predictor of citizens' intentions to adopt e-gov in KSA. Furthermore, the findings of Fuzzy Set Qualitative Comparative Analysis revealed an interesting result, whereby social influence with high levels of citizens' trust toward government and high citizens' trust toward e-gov webpages are essential conditions in all three generated configurations or solutions. These findings imply that social influence plays an important role in increasing the rate of adoption of Saudi citizens. Therefore, decision makers need to give attention to social influences in order to achieve high e-gov adoption rate, especially in a culture characterised with high levels of uncertainty avoidance. This could be achieved by first targeting highly influential individuals, such as those whose technological skills are trusted, people who are admired within the society or celebrities who make extensive use of social media applications. Such people need to be knowledgeable about the advantages of using e government so that they are able to exercise a persuasive influence on others to follow their example. After that the role of normative influence will proceed through citizens' confirmation of the positive expectations of those influencers. This will lead to the internalisation of the established new norms and the replacement of the previous conventional ways.

Social influence, however, is a necessary though not sufficient condition for an increase in the rate of e-gov adoption. Therefore, the decision makers need to give attention to the suggestions mentioned previously to overcome the pressure of what is accepted in society as it is difficult to be substituted with the focus on other factors which impact the adoption of e-gov, in addition to other necessary factors, namely trust toward government and trust toward e-gov webpages.

In respect to culture, it is a natural that individual experience uncertainty when confronting a new product or service, such as e-gov (Anne Lee, Garbarino and Lerman, 2007). Rationally, individuals might adopt strategies that reduce uncertainty, (Dacin and Smith, 1994), for example by increasing their familiarity with the new product or service (Anne Lee, Garbarino and Lerman, 2007). The decision makers therefore need to increase the familiarity of the e-gov system, by allowing citizens to gain experience, for example, in those governmental institutions that citizens visit to perform governmental transactions and where demonstrations of the system can take place and familiarity can be enhanced. In a similar vein, new products or services such as e-gov are less likely to be the subject of reduced levels of uncertainty when there is a deficit of information (Anne Lee, Garbarino and Lerman, 2007). In such a situation, the government could use "external cues" as an uncertainty reduction strategy (Lee and Lou, 1995). External cues can consist of positive feedback from well known, admired and trusted individuals who use the product or services (Standifird, 2001). Such a strategy, with government support, could make a significant contribution to the reduction of uncertainty on the part of citizens adopting an e-gov system in KSA.

7.4.3.4 Reducing the Complexity of the System

According to the results of SEM analysis, complexity is the strongest antecedent of citizens' adoption of e-gov in KSA. It negatively affects citizens' adoption. Citizens are less likely to adopt a complex system, and therefore decision makers need to emphasise the relative simplicity of e-gov. The system and its services need to be intuitive and easy to navigate. Citizens needs should be considered in respect to the presentation and organisation of the information required by them. They need to be able to find information and services without much cognitive effort. Frustration and difficulty could easily lead to reduced levels of adoption. Short visual tutorials would be helpful in explaining webpage procedures and decision makers could enhance the simplicity of the search engine so that citizens can quickly and easily find the services. When citizens complete their transactions, it will be highly useful if a space is provided for each one to express his/her perspective in respect to the services and the system as a whole. Consequently, e-gov system can be redesigned accordingly. Decision makers could also ensure that 'live chat' is constantly available when citizens need help or guidance. Creating a social network in the most popular platforms will aid response to citizens questions or requests for assistance. Instant and consistent responses to citizens' queries will enhance the perception in respect to the system and the services provided. Moreover, these accounts can also offer tutorials and share any new services provided so that citizens are aware of them and become accustomed to the process of using them.

According the research findings of fsQCA, decision makers are able to vanquish the influence of the complexity of e-gov adoption in one of two ways. The first way is by focusing on the compatibility of the system, the perception of ease of use and citizens trust toward technology, with attention given to the perception of usefulness. The second way is by focusing on the relative advantages of the system compared to the conventional way of government, with attention paid to the system's ease of use and citizens' trust toward technology.

7.4.3.5 The Enhancement of e-gov Compatibility:

On the basis of the current study outcomes, compatibility is found to be the third strongest predictor of citizens' adoption of e-gov in KSA. When citizens find e-gov is compatible with their lifestyles, they will be likely to prefer it to the conventional way of dealing with government. Decision makers can achieve this goal of raising the perception of compatibility by ensuring that the system runs smoothly. Decision makers need to make e-gov services reflect the conventional way in order to increase citizens' familiarity with the processes, which will make the latter more acceptable. For example, the traditional and hard copy forms of applying for passports and driving licences should be reflected in the structure of the electronic equivalents. Moreover, an auto filing feature of the main fields, such as names, addresses and national ID numbers, will serve to promote the adoption of e-gov services.

Compatibility has a significant effect on the adoption of e-gov. The outcomes of fsQCA exposed that the decision makers is able to overcome its high influence in either of two ways. The first way is by focusing on the ease of use of the system and its complexity, with attention paid to the usefulness and relative advantages of the system in comparison with the conventional way. Complexity, however, indicates the more sophisticated tasks that the system is able to perform, and citizens need to be well informed and guided in order to perform tasks easily. The second way is by focusing on the perception of relative advantages and by paying attention to the usefulness of the system and citizens' trust toward technology.

7.5 Limitations and Future Research:

As in other studies, the researcher has identified limitations that could be overcome in future research. The quantitative approach used in this study could have resulted in the omission of other important details when investigating the factors that influence the adoption of e-gov. Another limitation stems from the use of an online survey. The main functions of this approach to data collection are to overcome the conservatism of the culture, gender segregation, gender bias, the size of the area covered and a weak postal infrastructure. As a consequence, the targeted community was restricted to Internet users who might have expressed concerns incongruent to those of non-users of the Internet. Because of the major changes that are currently taking place in KSA, such as '2030 Vision' and the increased participation in social roles of women, a more effective approach to data collection could be adopted in future by other researchers.

Another limitation is the sample used in this research. With the continuing improvement of e-gov in KSA to achieve the aims of '2030 Vision', it has expanded to include non-Saudi individuals who work in KSA or who visit the country as pilgrims or as tourists. Several services are offered to those individuals by means of an e-gov system, such as the issuing visas, obtaining permission to take part in the Hajj and Omrah (pilgrims) or even issuing driving licences and online payment of fees. Therefore, testing and validating the model by gathering data from both Saudis and non-Saudis could produce more precise and comprehensive results and could lead to findings that differ from the current ones. This inclusiveness was not possible for the current research because of the time frame involved. Another concern is the technique used for sampling. Due to the unknown number of citizens who use e-gov in KSA, the research was not able to have a sample frame, and thus a non-probability sampling approach was used. This could affect the generalisability of the findings. Another important issue that could be considered as a limitation is the restriction of the participants in the questionnaire to those who have previously used e-gov, although this such restriction is in line with the purpose of the present study, which was to find the catalytic factors which impact citizens' adoption of e-gov in KSA. However, future research that includes citizens who did not use an e-gov system could shed light on other catalytic factors that influence adoption.

A cross-sectional survey was employed in this research. Consequently it featured those who adopted e-gov for a short specific time. Longitudinal research that entails data collection over a long period of time could be beneficial and lead to a more inclusive understanding of the adoption of e-gov. However, the time frame of the current research made it difficult to employ longitudinal study.

Despite the advantages of using fsQCA, it has some limitations that need to be considered. Researchers need to be aware that fsQCA is unable to handle latent variables and indicators jointly. Most social science variables are measured indirectly, by using indicators to reduce error. As fsCQA is unable to deal with latent variables, a transformation to the variables' indicators need to be performed so that they are conjoined in one item, by taking the mean of those variables' indicators. Consequently, some important information might be left behind. In a similar vein, researchers who use variables that are measured formatively need to take into consideration that it is not suitable and not recommended to perform a transformation for those variables' items, such as by taking means, as the indicators do not usually subrogate each other.

Most studies related to e-gov and e-commerce focus heavily on the causal pattern between dependent and independent variables to investigate a phenomenon in the proposed model. Important information could be missed by ignoring the combined influence, the complementarity and interdependent relations between and within the dependents and independent variables that are studied. Researchers investigating e-gov adoption in less advanced nations may in future combine fsQCA analysis or similar to gain a better understanding of the studied variables. The configurations resulting from such an analysis could produce a parsimonious model that offered a simpler and better explanation of the phenomenon.

Although uncertainty avoidance is the most conceptualised cultural dimension of the acceptance of technology in the literature, there is no obvious evidence in that literature of which cultural dimension has the most significant influence on the acceptance and adoption of technology or e-gov. Also, some studies have noted the interaction between some of these dimensions but these studies resulted in inconsistent findings. Therefore, another interesting area of further investigation might be the use of fsQCA in all cultural dimensions to investigate the combined influence of those dimensions and the interactions between them, instead of examining the isolated influence of each dimension. The validation of the conceptual model of the research was solely in the context of KSA. However, this does not limit the capability of the model, as the purpose was to identify the catalytic factors which impact citizens in KSA to adopt e-gov. However, it cannot safely be concluded that the model is applicable to different countries, whether or not they share some characteristics with KSA.

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Agag, G., El-masry, A., Alharbi, N. S. & Ahmed Almamy, A. (2016) 'Development and validation of an instrument to measure online retailing ethics: Consumers' perspective'. Internet Research, 26 (5), pp. 1158-1180. <u>https://doi.org/10.1108/IntR-09-2015-0272</u>
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Presentation at Conferences:

'Elements of E-gov Change and Adoption in KSA' at the 2nd International Conference on Business and Social Sciences (ICBBS 2017) University of Cambridge.

Appendix A: Non-response Bias Test

Independent S	amples Test				
	Levene's Test	for Equality of	t-test for Equali	ty of Means	
	Variances	1 2	· ·		
	F	Sig.	Sig. (2-tailed)	Mean Difference	
TRUG1	0.201	0.479	0.393	-0.341	
TRUG3	0.725	0.184	0.393	-0.341	
TRUG4	1.123	0.058	0.272	-0.522	
TRUT2	0.033	0.642	0.272	-0.522	
TRUT3	3.026	0.012	0.935	-0.168	
TRUW1	0.333	0.623	0.934	-0.168	
TRUW2	0.857	0.315	0.462	-0.566	
TRUW3	0.331	0.522	0.462	-0.566	
EOU1	3.229	0.019	0.671	0.310	
EOU3	0.182	0.728	0.671	0.310	
EOU4	2.363	0.081	0.436	0.267	
USF2	0.836	0.212	0.436	0.267	
USF3	0.283	0.723	0.577	0.205	
RELT1	0.643	0.314	0.576	0.205	
RELT2	1.235	0.037	0.316	0.622	
RELT3	0.478	0.328	0.315	0.622	
COMP1	0.392	0.748	0.719	-0.217	
COMP2	1.920	0.024	0.719	-0.217	
COML1	0.374	0.293	0.481	0.385	
COML2	0.859	0.839	0.481	0.385	
SOCL2	0.582	0.062	0.576	-0.298	
SOCL3	0.278	0.473	0.576	-0.298	
INTN1	0.473	0.574	0.348	-0.432	
INTN3	0.384	0.067	0.348	-0.432	
INTN4	0.049	0.217	0.134	-0.626	
UNCT1	0.485	0.094	0.133	-0.626	
UNCT2	0.172	0.694	0.467	-0.523	
			0.384	-0.074	
			0.283	-0.832	
			0.372	-0.232	
			0.302	-0.182	

Table 7.2 Tables for Non-response Bias Test

Appendix B: Common Methods Bias Test

	Initial F	Figenvalues		Extractio	$\frac{1}{1}$ Sume	of Squared
Component		Igenvalues		Ladina	, Sums	of Squared
e e inpenienie				Loadings	5	
	Total	0/2 of	Cumulative %	Total	0/2 of	Cumulative %
	Total	Variance	Cumulative 70	TOTAL	Variance	Cumulative 70
		v arrance			v arrance	
1	29.35	32 627	32 627	29 350	32 627	32 627
2	7.392	11.232	43.483	27.000	52:027	52.027
$\frac{1}{3}$	7.233	9.049	52.532			
4	7.127	8.450	60.982			
5	6.363	6.405	67.387			
6	5.870	6.213	73.600			
7	5.564	5.582	79.182			
8	5.218	5.235	84.417			
9	4.314	3.943	88.360			
10	3.933	3.211	91.571			
11	2.861	2.427	93.998			
12	2.819	1.253	95.248			
13	1.780	0.847	96.088			
14	1.662	0.736	96.818			
15	1.471	0.671	97.488			
16	1.432	0.593	98.078			
17	1.335	0.475	98.548			
18	1.183	0.239	98.778			
19	0.841	0.204	98.978			
20	0.810	0.185	99.458			
21	0.806	0.083	99.538			
22	0.723	0.074	99.808			
23	0.711	0.071	99.878			
24	0.680	0.062	99.838			
25	0.632	0.051	99.888			
26	0.598	0.050	99.898			
27	0.539	0.047	99.908			
28	0.433	0.044	99.968			
29	0.401	0.039	99.971			
30	0.317	0.039	99.973			
31	0.283	0.037	99.975			
32	0.171	0.033	99.900			
33	0.130	0.032	99.210			
34	0.127	0.031	99.010			
35	0.120	0.032	99.023			
36	0.118	0.029	99.023			
37	0.117	0.027	99.047			
38	0.116	0.026	99.482			
39	0.115	0.026	99.270			
40	0.110	0.023	99.263			
41	0.110	0.022	99.254			
42	0.109	0.021	99.253			

Table 7.3 Table 26 Tables for Common Methods Bias Test

43	0.100	0.011	100		

Appendix C: Ethical Approval



Ref: FoB/UPC/FREC/FREC1516.56 Date: 27 June, 2016

Dear Ahmed

Ethical Approval Application No: FREC1516.56 Title: Factors affecting the adoption of e-government in Saudi Arabia

The Faculty Research Ethics Committee has considered the ethical approval form and is fully satisfied that the project complies with Plymouth University's ethical standards for research involving human participants.

Approval is for the duration of the project. However, please resubmit your application to the committee if the information provided in the form alters or is likely to alter significantly.

We would like to wish you good luck with your research project.

Yours sincerely

(Sent as email attachment)

Dr James Benhin Chair Faculty Research Ethics Committee Faculty of Business

Faculty of Business University of Plymouth Drake Circus Plymouth Devon PL4 8AA United Kingdom +44 (0) 1752 584979/85888 +44 (0) 1752 585715 www.plymouth.ac.uk

F W

Figure 7.20 Ethical Approval

Appendix D: The Research Questionnaires

C # 2 # 3	
	كلية الإدارة
PLYMOUTH	كلية بليموث للأعمال
	المتحدة المملكة
á sa há sa háta na háta tenna sa hata	10 5 35-11 1-1
ن بيني الحدومة الإندارونية في الممتحة العربية الشعودية	عقوان البعت العوامل الموترة علي
نوراه في جامعة بليموث، كلية إدارة الأعمال ,أتحقق من العوامل المؤثرة على تبني الموا	عزيزي السيد/السيدة أنا باحث دكن
ربية السعودية من هنا أرسل اليكم هذا الإستبيان لجمع آراء مستخدمي الحكومة الإلكتر.	للحكومة الإلكترونية في المملكة الع
د هناك أجوبة صحيحة أو خاطئة، نحن فقط مهتمون بأرائكم .وبالتالي إذا كنت تستخدم خد.	في المملكة العربية السعودية لاتوج
ستخدامها يرجى الإجابة على جميع الاسئلة قدر ما تستطيع، وإعادة الاستبيان . إذا واجهتك السرا	الحكومة الإلكترونية او لديك نية لإ
. بصال بي على العلوان المرقق الداه . (ذكم مهم للعليه للجاح هذه اللاراسة وسوف يبقى في س سيدية كذلك: بطال إلى معادمات تحدد هدتاك في هذا الاحتداث جارد أن أخد كبرك مثل م	صعوبه أو لذيك أي أسئله الرجاء الا تامة مديدكم أرضا معمالة م
سرية حاف من يصب إي معنومات تحدد موينت في من الاستيال .واود من المبركم بان مسار. و أنت حد في سحب مشار كذك من هذه الدر اسة في أي وقت قبل اكمال الدر اسة و لكن لا يم	ف، هذه الدر اسة هي تيط عبة تماما
رد في الحد إذا كنت ترغب في الحصول على نسخة من نتائجه يرجى تزويدنا بعنو ان الو)2 ، إلى هذا الحد إذا كنت ترغب في الحصول على نسخة من نتائجه يرجى تزويدنا بعنو ان الو	سحبها بعد التحليل في 17/01/01
	الإلكتروني في نهاية الدراسة
	. شكر ا جزيلا لكم لحسن تعاونكم .
	تفضلوا بقبول فائق تحياتي
	أحمد المامي
	جامعة بليموث
	كلية الإدارة
ahmed.almamy@plym	البريد الإلكتروني outh.ac.uk
استبيان الرجاء القراءة ووضع علامة في المربع التالي :الباحث أعطاني نسختي الخاصة من	إذا وافقت على المشاركة في هذا الإ
ا وفهمتها و توضح طبيعة البحث وما المطلوب مني القيام به كمشارك .أنا أتفهم ان هذا البحث	ورقة المعلومات التي كنت قد قرأتها
علومات التي أقدمها سوف تصان بسرية مالم تخضع لأي شروط قانونية . أنا أو افق على ·	هو لمشروع لباحث دكتوراة وأن الم
ني حر في الانسحاب في أي وقت قبل التحليل في 2017/01/01 دون إيداء أي سبب ودون	المشاركة في هذا البحث، وأنا أفهم أ
	الإضرار بنفسي .
" : هي الإبتكارات الجديدة التي تسعى إلى نقل الطريقة التقليدية لإجراء المعاملات الحكومية	
سرعة ورخص الخدمات للمواطنين	خدمات إلكترونية لتحسين الجودة وم
	أمثلة للحكومة الإلكترونية
الـ ، قام الانتراني	 البحث عن المستندات المر
عقوبه في سبحة ، مسرحت بة من خلال شبكة الانترنت	 طبحت عن تستند طباعة الاستمار ات الرسم
چان <u>مری میں میں میں میں میں میں میں میں میں می</u>	 تجديد جواز السفر أو رخ
	555 <u>55</u> -

Figure 7.21 Arabic Version of the Questionnaire

الجزء الأول: العوامل المؤثرة على تبني الحكومة الإلكترونية

أرجو استخدام القياس التالي للتعبير عن رأيك اتجاه الحكومة الإلكترونية:

5 = أوافق بشدة، 4 = أوافق، 3 = محايد، 2 = لا أوافق، 1 = أوافق بشدة

ثقة في الحكومة	لا بٹ	اوافق ىدة		أو ب	رافق ئىدة
ا أعتقد أن الجهات الحكومية تتعمل في مصلحة المواطن	1	2	3	4	5
ا أعتقد أن الجهات الحكومية صادقة ونزيهة وجدية في تعاملاتها	1	2	3	4	5
مكل عام، فإن الحكومة يمكن الاعتماد عليها للوفاء بالتزاماتها	1	2	3	4	5
ثقة في التكنولوجيا					
بكة الإنترنت تحتوي على ضمانات كافية لتجعلني أشعر بالراحة عند استخدامها لمزاولة الأعمال	1	2	3	4	5
شخصية مع الجهات الحكومية					
ا على يقين من أن الهياكل القانونية والتكنولوجية توفر حماية كافية لي من المشاكل على شبكة الإنترنت	1	2	3	4	5
لى على ثقة من أن التشفير والتقدم التكنولوجي الآخر على الإنترنت جعلها آمنة بالنسبة لي للتعامل	1	2	3	4	5
مكل عام، فإن الإنترنت الآن هو بينة آمنة ومتينة لمزاولة الأعمال التجارية	1	2	3	4	5
ثقة في المواقع الحكومية الإلكترونية					
رقع الحكومة الإلكترونية هو جدير بالثقة	1	2	3	4	5
يقع الحكومة الإلكترونية ذو مصداقية	1	2	3	4	5
يقع الحكومة الإلكترونية يمكن الوثوق به	1	2	3	4	5
نظورك لسهولة الاستخدام					
نفاعل مع المواقع الحكومة الإلكترونية يتطلب الكثير من الجهد الذهني	1	2	3	4	5
فاعلي مع مواقع الحكومية الإلكترونية سهل الفهم بالنسبة لي	1	2	3	4	5
ا لا أجد أن مواقع الحكومة الإلكترونية بحاجة إلى مهارات عالية	1	2	3	4	5
نعلم للتفاعل مع المواقع الحكومية الإلكترونية سبهل بالنسبة لي	1	2	3	4	5
نتقد أن التفاعل مع المواقع الحكومية الإلكترونية عملية واضحة ومفهومة	1	2	3	4	5
نظورك لجدوى الخدمة					
راقع الحكومة الإلكترونية تتيح لي إنجاز المهام بسرعة أكبر	1	2	3	4	5
متخدام مواقع الحكومة الاكترونية توفر لي الكثير من الوقت	1	2	3	4	5
ستخدام مواقع الحكومة الإلكترونية تسبهل لي القيام بعملي	1	2	3	4	5
اقع الحكومة الإلكترونية تتيح لي إتمام المعاملات المختلفة يسرعة أكبر	1	2	3	4	5
فوائد النسبية					
استخدام شبكة الإنترنت يحسن كفانتي في جمع المعلومات من الحكومة الإلكترونية	1	2	3	4	5
استخدام شبكة الإنترنت يحسن كفانتي في التفاعل مع الحكومة الإلكترونية	1	2	3	4	5
، استخدام شبكة الإنترنت لايسهل استكشاف وجمع المعلومات من مواقع الحكومية الإلكترونية	1	2	3	4	5
، استخدام موقع الحكومة الإلكترونية يجعل التفاعل مع الحكومة أسهل	1	2	3	4	5
، استخدام موقع الحكومة الإلكترونية يعطيني تحكم أكبر على تفاعلي مع الحكومة	1	2	3	4	5
لبيلت استخدام مواقع الحكومة الإلكترونية تفوق بكثير المزايا	1	2	3	4	5
وافق					
أنا أعتقد أن استخدام شبكة الإنترنت يتناسب جيدا مع الطريقة التي أفضل جمع المعلومات من الحكومة الإلكترونية	1	2	3	4	5
---	----------	---	---	---	---
أنا أعتقد أن استخدام شبكة الإنترنت يتناسب جيدا مع الطريقة التي أفضل أن أتفاعل مع الحكومة	1	2	3	4	5
إستخدام شبكة الإنترنت للتفاعل مع الحكومة تناسب نمط حياتي	1	2	3	4	5
استخدام شبكة الإنترنت للتفاعل مع الحكومة غير متوافق مع كيف أفضل أن أفعل ألأشياء	1	2	3	4	5
التعقيد					
من السهل بالنسبة في التنقل داخل مواقع الحكومية الإلكترونية	1	2	3	4	5
تعلم إستخدام موقع الحكومة الإلكترونية لإستكشاف المعلومات والقيام بمعاملات مختلفة سهل بالنسبة لي	1	2	3	4	5
أنا أعتقد أنه من السهل الحصول على موقع الحكومة الإلكترونية لتفعل ما أريد أن تفعله	1	2	3	4	5
التأثير الاجتماعي					
الأشخاص الذين لهم تأثير على سلوكي يعتقدون أنه ينبغي أن استخدم نظام الحكومة الإلكترونية	1	2	3	4	5
أنا أود أن استخدم خدمات الحكومة الإلكترونية إذا إستخدمها الأشخاص المهمين بالنسبة لي	1	2	3	4	5
الأشخاص من حولي الذين يستخدمون نظام الحكومة الإلكترونية لديهم مكانة أكثر	1	2	3	4	5
أنا أود استخدام الخدمات الحكومية على الإنترنت إذا كنت بحاجة إلى ذلك	1	2	3	4	5
النية لاستخدام الحكومة الإلكترونية					
أنا أنوي استخدام موقع الحكومة الإلكترونية في المستقبل القريب	1	2	3	4	5
أنا أنوي استخدام موقع الحكومة الإلكترونية للوصول إلى الخدمات الحكومية بشكل متككر	1	2	3	4	5
أنا أخطط لاستخدام خدمات الحكومة الإلكترونية من خلال مواقعهم	1	2	3	4	5
أنا سوف أستمر في استخدام مواقع الحكومية الإلكترونية في المستقبل	1	2	3	4	5
تجنب عدم اليقين					
يجب ان اتجنب إجراء تغييرات عندما تكون نتائجها غير مؤكدة بالنسبة لي	1	2	3	4	5
القواعد واللوائح مهمة لأنها ترشدني لما هو متوقع مني ان افعل	1	2	3	4	5
	.	1			-

	الرجاء تزويدنا بالمعلومات التالية (اختر المناسب بالنسبة لك)		
الجنس	الدخل	العمر	
رجا	<1000	25 اقل من	
امر	1000-2000	25 - 30	
	2000-3000	31 - 40 41 - 50	
	>4000	50 اعلى من	
	التحصيل العلمي	خبرة الانترنت (سنين)	
	بخانوريوس معهد	< <u>2</u> 2<5	
	دکتور اه او ماجستیر	>5	
	32 3 33		
تقدیر کبیر اِذا کان	الخرى الحرى المعلومات موضع	ا أشكر كم على إستقطاع الوقت لإستكمال	
تقدير كبير إذا كان 6 والتي تعتقد أنها قد السعودية، يرجى	المعلومات موضع هذا الاستبيان مساعدتكم في توفير هذه المعلومات موضع ن هذا الإستبيان أو أي تعليقات ترغب فيا عن هذه الدراسا ى تبني المواطنين الحكومة الإلكترونية في المملكة العربية	أشكركم على إستقطاع الوقت لإستكمال هناك أي شيء أخر تود أن تخبرنا به ع تساعدنا على فهم العوامل التي تؤثر عل	
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تقدير كبير إذا كان زوالتي تعتقد أنها قد السعودية، يرجى	هذا الاستبيان مساعدتكم في توفير هذه المعلومات موضع هذا الاستبيان مساعدتكم في توفير هذه المعلومات موضع بن هذا الإستبيان أو أي تعليقات ترغب فيا عن هذه الدراسة ي تبني المواطنين الحكومة الإلكترونية في المملكة العربية ه	أشكركم على إستقطاع الوقت لإستكمال هناك أي شيء آخر تود أن تخبرنا به ع تساعدنا على فهم العوامل التي تؤثر عله القيام بذلك في المكان المخصص أدنا	
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تقدير كبير إذا كان ، والتي تعتقد أنها قد السعودية، يرجى	لغرى هذا الاستبيان مساعدتكم في توفير هذه المعلومات موضع من هذا الإستبيان أو أي تعليقات ترغب فيا عن هذه الدراسا ى تبنى المواطنين الحكومة الإلكترونية في المملكة العربية ه	أشكركم على إستقطاع الوقت لإستكمال هناك أي شيء آخر تود أن تخبرنا به ع تساعدنا على فهم العوامل التي تؤثر عله القيام بذلك في المكان المخصص أدنا	
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تقدير كبير إذا كان والتي تعتقد أنها قد السعودية، يرجى	لفذا الاستبيان. مساعدتكم في توفير هذه المعلومات موضع هذا الاستبيان أو أي تعليقات ترغب فيا عن هذه الدراسا ى تبني المواطنين الحكومة الإلكترونية في المملكة العربية ه	أشكركم على إستقطاع الوقت لإستكمال هناك أي شيء آخر تود أن تخبرنا به ع تساعدنا على فهم العوامل التي تؤثر عل القيام بذلك في المكان المخصص أدنا	

School of Management Plymouth Business School University of Plymouth Plymouth United Kingdom



Research Title: Factors Impacting E-government Adoption in Saudi Arabia Using Fuzzy Set Qualitative Comparative Analysis and PLS Path Modelling.

Dear Sir/Madam

I am a PhD researcher at University of Plymouth, Business School, **Investigating the factors affecting citizen's adoption of e-government in Saudi Arabia**.

I am thus sending to you the accompanying questionnaire in order to gather the opinions of egovernment users in Saudi Arabia. There are no right or wrong answers; we are just interested in your opinions. Thus if you are using e-government services or have the intention to use them please answer all questions as best as you can and return the completed questionnaire. If you face any difficulty or have any questions, please contact me on the address below. Your response is extremely important to the success of this study and will be held in strict confidence. Your responses are also anonymous and confidential as no information that identifies you is asked in this questionnaire. I would like to let you know that your participation in this survey is completely voluntary and you are free to withdraw your participation from this study at any time before you complete the survey but you cannot withdraw after the analysis in 01-01-2017.

To that extent if you would like to receive a copy of its findings, please provide us with an e-mail address at the end of the survey.

Thank you very much in anticipation for your kind co-operation. Yours sincerely

Ahmed Almamy

University of Plymouth School of Management E-mail: ahmed.almamy@plymouth.ac.uk

If you agree to participate in this survey, please read and tick the following box:

The researcher has given me my own copy of the information sheet which I have read and understood. The information sheet clarifies the nature of the research and what I would be asked to do as a participant. I comprehend that the research is for a PhD student project and that the confidentiality of the information I provide will be safeguarded unless subject to any legal requirements.

I agree to take part as a participant in this research and I understand that I am free to withdraw at any time before the analysis in 01-01-2017 without giving any reason and without detriment to myself.

E-government Definition:

" A new innovation which seek to transfer the traditional way of conducting government transactions into online services for better quality, cheap and fast services to the citizens".

Examples of e-government:

- Looking for required documents in the internet.

- Printing official forms through the internet.

- Renew passport or licences online.

Figure 7.22 English Version of the Questionnaire

PART 1: Factors affecting the adoption of e-government

Please use the following scale to describe your opinion towards e-government services: 5= Strongly Agree (SA), 4= Agree (A), 3= Neutral (N), 2= Disagree (D) and 1= Strongly Disagree (SD).

Trust in Government	Stro	ngly ee		Stron	igly gre
I believe that the government agency acts in citizen's best interest.	5	4	3	2	1
I believe that the government agency is truthful, honest and genuine in its dealings.	5	4	3	2	1
In general, the government is reliable to meet their obligations.	5	4	3	2	1
Trust in Technology					
The Internet has enough safeguards to make me feel comfortable using it to transact personal business with government agencies	5	4	3	2	
I feel assured that legal and technological structures adequately protect me from problems on the Internet	5	4	3	2	
I feel confident that encryption and other technological advances on the Internet make it safe for me to transact	5	4	3	2	
In general, the Internet is now a robust and safe environment in which to transact business.	5	4	3	2	
Trust in e-government Websites					
This e-government website is trustworthy	5	4	3	2	
This e-government website is honest and truthful	5	4	3	2	
This e-government website can be trusted.	5	4	3	2	
Perceived Ease of Use					
Interacting with e-government websites requires a lot of my mental effort.	5	4	3	2	
My interaction with e-government websites is easy for me to understand.	5	4	3	2	1
I do not find that e-government websites need high skills.	5	4	3	2	
Learning to interact with the e-government websites would be easy for me.	5	4	3	2	
I believe interacting with the e-government websites would be a clear and understandable process.	5	4	3	2	
Perceived Usefulness					
E-government websites enable me to accomplish tasks more quickly.	5	4	3	2	E
Using e-government websites save me time.	5	4	3	2	
Using e-government websites make it easier to do my job.	5	4	3	2	
E-government websites would enable me to complete different transactions more quickly.	5	4	3	2	
Relative Advantages					
Using the web would enhance my efficiency in gathering information from the e- government.	5	4	3	2	
Using the web would enhance my efficiency in interacting with the e-government.	5	4	3	2	t

Using the web would not make it easier to explore and gather information from e- government websites.	5	4	3	2	1
Using E-government website would make it easier to interact with government.	5	4	3	2	1
Using E-government website would give me greater control over my interaction with	5	4	3	2	1
The disadvantages of my using the E-government website far outweigh the	5	4	3	2	1
Compatibility					
I think using the web would fit well with the way that I like to gather information from e-government.	5	4	3	2	1
I think using the web would fit well with the way that I like to interact with the government.	5	4	3	2	1
Using the web to interact with government would fit into my lifestyle.	5	4	3	2	1
Using the web to interact with the government would incompatible with how I like to do things.	5	4	3	2	1
Complexity					
It is easy for me to navigate within e-government websites.	5	4	3	2	1
Learning to use the E-government website for exploring information and do different transaction is easy for me	5	4	3	2	1
I believe that it is easy to get the E-government website to do what I want it to do.	5	4	3	2	1
Social Influence					
People who influence my behaviour think that I should use e-government system.	5	4	3	2	1
I would use online government services if important people to me used them	5	4	3	2	1
People around me who use the e-government system have more prestige.	5	4	3	2	1
I would use online government services if I needed to.	5	4	3	2	1
Intention to Adopt e-government					
I intend to use the e-government website in the near future	5	4	3	2	1
I intend to use the e-government website to access government services frequently	5	4	3	2	1
I plan to use e-government services from this website	5	4	3	2	1
I will continue using e-government websites in the future	5	4	3	2	1
Uncertainty Avoidance					
I should avoid making changes when their outcomes are uncertain to me.	5	4	3	2	1
	-	4	2	2	1
Rules and regulations are important because they inform me what is expected of	5	4	3	-	1

ale male	<1000 1000-2000	Under 25
ale smale	<1000 1000-2000	Under 25
	1000-2000	
	2000 2000	23 - 30
	3000-4000	41 - 50
	>4000	Over 50
	Educational qualifications you hold	Internet experience (years):
	Bachelor Diploma	< 2
	PhD or Master's	2<5
	Others	>5
If there is anything else you wish to make that adoption of e-governme	you would like to tell us about you think may help us to unde ent in Saudi Arabia, please do s	this survey or other comments ristand the factors affecting the so in the space provided below.