E-government and Digital Divide in Hail City: A Quantitative, Older Adults Study

A Thesis Submitted to the University of Hertfordshire in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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Abstract

The subject of information and communication technologies adoption, Internet and e-government services in particular, have been widely investigated by researchers. It is an indication of the significant roles that can be brought to individuals and societies by such advanced technologies in which enhancing quality of life is the ultimate goal. Unfortunately, many groups within societies are not gaining the advantages and benefits of the Internet and e-government because they are less receptive to ICTs. This has created a phenomenon known as the digital divide. Amongst these groups are the older adults. The rising attention towards the elderly is due to the increasing life expectancy. Thanks to health technological advancements and life style improvements, which are leading to better qualities of life, countries around the globe have older adults population rate larger than ever before. Saudi Arabia is no exception, as demographic characteristics have been changing in which life span is increasing and fertility is decreasing. However, literature of older adults and technology adoption, particularly adoption of Internet and e-government lacks the context of developing countries and the Arab world. Therefore, using this as a motivation, this study aims to ***identify, explain and understand the adoption, use and diffusion of e-government services within the older adults population (50+) of a vicinity in Saudi Arabia***. The study uses a quantitative research method along with a positivist epistemology. The data collection technique involved distributing survey questionnaires to households' residents (50+) in Hail city (area and simple random sampling). A small-scale pilot study was initially used (n=257) to validate and enhance the survey questions, followed by a wide-scale final study (n=937). Findings revealed that with regards to Internet adoption, age-based, gender-based, education-based and health-based digital divides do exist within the elderly population. It was also found by model analysis that elderlies' intentions of whether to use or not use e-government services are considerably impacted by attitudinal, subjective norms, control and trustworthiness factors, excluding the two factors of image and trust in government, which showed insignificance. The study makes positive contributions to related literature, policy makers and industry. Finally, due to the restraints of time, finance and manpower, this study examined only a small portion of the whole population of Hail city; therefore, generalisations of findings cannot be claimed.

Keywords: e-government, ICT adoption, older adults, Internet diffusion, digital divides, Saudi Arabia.

Dedication

I Dedicate This Thesis To My Dearest Parents And To My Beloved Wife…

Acknowledgments

"My Lord, enable me to be grateful for your favor which you have bestowed upon me and upon my parents and to do righteousness of which you approve. And admit me by your mercy into [the ranks of] your righteous servants." (The Quran 27:19, Surat Al-naml).

I would like to express my heartfelt appreciation and gratitude to my principal supervisor Prof. Jyoti Choudrie. Throughout this journey, you have been my greatest supporter and my best friend, and without your constant encouragement and guidance, this learning mission would have never been accomplished. Thank you for believing in me and for giving me the opportunity and privilege to complete my thesis under your supervision. I have learnt a lot from you on the personal and academic levels.

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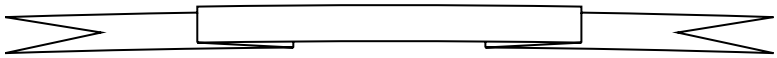
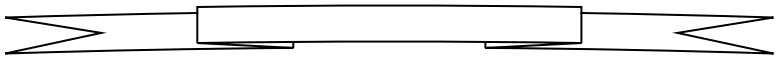


I also would like to express my sincere gratitude to my country, Saudi Arabia, and to my employer, University of Hail for making this dream comes true. Thank you for your generosity, support and trust. Thank you for offering me this precious opportunity to pursue my dreams.

My appreciation also goes to the University of Hertfordshire, the place where I had this golden opportunity to complete my PhD studies. I also thank the great staff of the university who had helped me from day one and made me feel home, especially Dr. Janice Turner and Angela Digby.



To my parents, Mr. Abdulmohsen & Mrs. Reema, I cannot find the words to convey my gratitude to you. Your unconditional and endless love and support since I was a little kid have made everything possible. I owe you everything, thank you.

Last but not least, I would like to thank my companion in this journey, my wife, Mrs. Reem. Thank you for your invaluable contributions to this thesis and for the continuous support you have provided me throughout the difficult times. My accomplishment is yours.

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List of Abbreviations

ICT	Information and Communication Technology
IT	Information Technology
G2G	Government to Government
G2B	Government to Business
G2E	Government to Employees
G2C	Government to Citizens
WHO	World Health Organization
IS	Information Systems
SEM	Structural Equation Modelling
PLS	Partial Least Squares
DOI	Diffusion of Innovation
TRA	Theory of Reasoned Action
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
MATH	Model of Adoption of Technology in Households
TPB	Theory of Planned Behaviour
DTPB	Decomposed Theory of Planned Behaviour
STAM	Model of Senior Technology Acceptance & Adoption
PC	Personal Computer
GCC	Gulf Cooperation Council

Publications

Choudrie, J **Alfalah, A. (2016).** Older Adults in Households and e-Government services in Saudi Arabia, Hail City: A digital Divide Study of Adoption, Use and Diffusion. PACIS 2016 Proceedings. 338. (Research-in-progress).

Choudrie, J., **Alfalah, A**., & Spencer, N.H. (2017). Older Adults Adoption, Use and Diffusion of E-Government Services in Saudi Arabia, Hail City: A Quantitative Study. Proceedings of the 50th Hawaii International Conference on System Sciences, 2953-2962.

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Chapter 1

Introduction

1.0 Introduction

This introductory chapter is to inform readers of the key elements and components of the research study. It begins with section 1.1 in which the research problem, background and purpose are given. This is followed by section 1.2 that specifies the aim, objectives and questions of the research. Section 1.3 then clearly defines the research scope; followed by a description of the research approach applied to fulfil the intended aim and objectives in section 1.4. Next is section 1.5 that summarises the contributions that this research will make to policymakers, practice (industry) and academia. A dissertation outline and the thesis structure diagram are offered in sections 1.6 and 1.7. Finally, is section 1.8, a summary that concludes information and content provided in the first chapter.

1.1 Background to The Research Problem

To obtain economic growth, global countries and institutions all over the world are implementing, or attempting to implement a telecommunications infrastructure such that a proliferation of Information and Communications Technologies (ICTs) can occur (Helbig et al, 2005). The appreciation of ICT and technological innovations benefits has led to the development of broadband infrastructure around the globe (ibid). The widespread use of ICT is also being viewed as beneficial not only by organisations and society alike, but also by governments as it enables them to interact directly with citizens. Many governments no longer depend on conventional channels for providing their services to stakeholders. Instead, due to significant ICT investments, there is a large reliance on online environments becoming the primary portal of interaction with beneficiaries.

The provision of online government products and services is simply known as electronic government (e-government) (Carter & Belanger, 2003). E-government purpose is to create transparency, effectiveness and convenience of online interaction channels between the government and other official agencies, business bodies and individuals. E-government takes various forms, including: G2G (government to government), G2B (government to business), G2E (government to employees), or G2C (government to citizens) (Klabi et al, 2016). The latter is the form of e-government this research focuses on. Further, e-government is viewed to be essential for the development of a country, which has led to the concept of Information and Communication Technologies (ICT) for development (ICT4D) (The World Bank, 2013; Njihia & Merali, 2013). Within the field of Information Systems

(IS), the term Information and Communication Technology for Development ICT4D has arisen as an expansion. It focuses on studying the association between ICTs and development. Ever since their advancements, ICTs are considered to be means of reducing or eliminating poverty, which could lead to development (Njihia & Merali, 2013).

As governments and citizens alike progress towards the advanced age of Internet and e-service provision and towards development through adoption and maximum exploitation of ICT, there are some demographic groups that are technologically isolated with none or minimal online presence (Choudrie et al, 2013). This has created divisions within societies and even within nations, which is causing an uneven distribution of novel technologies that is known as a digital divide (Antonelli, 2003). Ironically, it has been found that individuals who are the focal beneficiaries of online services provided by government are the least able to adapt to modern ICTs, including the Internet (Dugdale et al, 2005).

A group of society within countries that is currently not accepting and using ICT and e-government is the older adults (Choudrie et al, 2013; Niehaves & Plattfaut, 2014). The World Health Organization (WHO) (2015) stated that the definition of older adults differs from one country to another, with developed countries viewing older adults as individuals who receive pension aids, whereas in the developing world this definition is not necessarily applicable. For the purpose of this research, the definition of older adults being used is individuals who are 50 years or older (Hanson, 2009).

The rising importance and attention towards elderly citizens are mainly driven by the increasing life expectancy. Thanks to technological health advancements and life style improvements, which are leading to better qualities of life, countries around the globe have more older adults population than ever before (Choudrie et al, 2013). In terms of elderly populations, Saudi Arabia, where this research took place, is no exception as demographic characteristics have been changing in which the life span is increasing and fertility is decreasing (Nancy et al, 2016). In 2016, nearly 13.5% of the total population in Saudi Arabia were of age 50 years and older (Saudi General Authority for Statistics, 2016). It is predicted that by 2050, the elderly population would comprise approximately 18.4% of the total Saudi population (Nancy et al, 2016).

Another important reason that has motivated this research to shed light on older adults citizens is the fact that older adults are important individuals within societies who desire to feel included and valuable in order to accomplish “successful ageing” (Fenton & Draper, 2014). Unfortunately, there is a widespread notion that older people offer only limited contributions to their societies whereas in reality, older adults offer large economic and social contributions. They are known for their accumulative knowledge and skills gained throughout life experience, contribution to the economy in terms of employment, entrepreneurship and holding large amounts of wealth in society (North & Fiske, 2015; ActiveAge, 2010). In the UK for instance, adults aged 65 years and older contributed to the economy an overall sum of £40 billion in 2010. This is credited to their spending habits and the value of their volunteering (Fenton & Draper, 2014). Further, in terms of societal

aspects, older adults offer significant contributions to their communities and neighbourhoods due to their continuous and enthusiastic involvement in the places they reside in. In addition, older people have more tendencies to volunteer and participate in community-based institutions [ibid]. By combining these factors and capabilities of the elderly there is a clear indication of the potential that older adults have in terms of promoting communities, improving and building community capacity (ActiveAge, 2010).

Earlier, it was mentioned that ICT are advancing as awareness of their potential becomes apparent. For the older adult population, which has become a demographic group that countries around the globe are concerned for, the proffered benefits include an improvement in the quality of care (National Institute on Aging, 2007; Stanford Center Longevity, 2009). E-government is also considered to be relevant to older adults as it can assist in providing improved and dedicated services including services that help in confronting exclusion, isolation and poverty. Alongside, e-government is viewed to be a mean of enhancing the health of elderly (Information Daily, 2006). In addition, as the Internet acts as the backbone and the main channel for e-government delivery to citizens (Norris et al. 2001), this research not only explores the adoption of e-government but also explores the digital divide and Internet technologies diffusion and use within older adults population.

1.2 Research Aim, Objectives, and Research Questions

The aim of any research project is meant to throw light on the broad picture and principal intentions of the research (University of Southampton, 2007). This aim broadness is then narrowed down and elucidated by a set of specific and straightforward objectives of the research (ibid). Research objectives are meant to clearly state predicted outcomes and should be highly concentrated and feasible. In other words, the research aim answers the question of what to be achieved whereas the research objectives emphasise how the aim will be achieved. A research project usually reports a maximum of two to three aims statements, and a list of several objectives to be accomplished (ibid). Following are the aim and objectives of this research.

In terms of this research, e-government and technological isolation of older adults has only received marginal attention from researchers, especially in the context of developing nations, which suggested the existence of a research gap. Having identified that there exists a gap in research focused on e-government, digital divide and older adults, this research was motivated to reduce the existing research gap by forming the aim, which is:

Aim of this Research Study

To identify, explain and understand the adoption, use and diffusion of e-government services within the older adults population (50+). The research context of this study is a vicinity in Saudi Arabia. To ensure that an in-depth prospective can be obtained, this research will be focused on the research site of Hail city.

Research Objectives

Having determined the aim of this research, the objectives that will lead to accomplishing the aim are provided:

1. To identify, understand and critique relevant information systems (IS) literature to form a theoretical understanding of this research study. For this purpose, literature will be drawn from topics such as, e-government, older adults, ICT, developing countries, and the themes of adoption, use, diffusion and digital divides.

2. To develop a conceptual model and research hypotheses so as to study older adults adoption of e-government services in Saudi Arabia and to grasp the existing challenges older adults encounter in this regard. Information systems literature abounds of many well-established and well-recognised theories and models concerning technology adoption and diffusion by which this research study derives the constructs to be studied and hypotheses to be tested. For readers information, constructs are "conceptual or theoretical entities that are not directly observable and are the topics of research" (Levine & Kotowski, 2010 p.68).

3. To form an appropriate research methodology: a quantitative approach in which survey questionnaire will be conducted in Saudi Arabia, Hail city in order to empirically validate the research model and hypotheses.

4. A pilot survey will initially be developed and carried out after establishing questionnaire content validity by a panel consisting of 10 experts and individual of relevance to the topic. The content validity process is meant to determine the relevance and representativeness of the survey questions.

5. To develop the final survey questionnaire based on the outcomes and the lessons learned from the pilot phase. Therefore, after refinements of the pilot survey, the final survey will contain the finalised constructs and their items and will be distributed to older adults of the age of 50 years old and above in the city of Hail in the northern region of Saudi Arabia.

6. Construct validity and reliability measurements, such as Cronbach's alpha, composite reliability and discriminant validity will be applied to determine stability and consistency of the constructs , and to make sure they precisely measure what they are meant to measure. Proposed research hypotheses will also be tested in order to determine their validity by the application of Structural Equation Modelling (SEM) techniques using SmartPls software package.

7. To evaluate the research findings and form a discussion section that places the research findings in terms of previously undertaken technology adoption and use literature. A summative evaluation will also be carried out in order to further validate the findings in which a set of semi-structured interviews with 10 participants will be conducted. The evaluation will consist of two main sections, the first section evaluates the outcomes of hypotheses testing while the second section concerns whether this research study has had an impact on older adults participants in terms of their behaviour, attitude and/or intention.

8. From the conclusions of this research, which includes summarising of the chapters, forming a conclusion, providing the implications of this research for relevant policy makers, practice and academia. Finally, research limitations, recommendations and future directions will be provided.

1.2.1 Research Questions

Having identified the research problem, aim and objectives, this section defines the research questions. The process of formulating research questions basically endeavours to translate and clarify the identified problem into a direct scientific research questions that need to be answered in order to accomplish previously allocated aim and objectives (Appannaiah et al. 2010). Research questions also imply many other aspects of a given research, including its direction, scope, limitations and the context of the problem (ibid). This research is a digital divide study of adoption, use and diffusion with a specific focus on how the older adults population of Hail city accept and use e-government services. Therefore, research questions are formed as follows:

Research Question 1*: What socio-demographic variables significantly influence an older individual to adopt or not adopt the Internet?*

Research Question 2*: What attitudinal, subjective norms, control and trustworthiness factors significantly influence an older individual intention to use or not use the MOI e-portal services?*

1.3 Research Scope

This research is mainly designed to understand and examine the factors by which older adults' attitudes and intentions towards the adoption and use of e-government services are influenced. It is a combination of both social and technological focused dissertation; thus, it considers both social and technical factors that might influence e-government services adoption. Having identified that this is a socio-technological study, it is declared at this point that this research study accounts for its emphasis on the societal aspects. Therefore,

although some related technological attributes of e-government services are investigated in this research, this research is not focused on technological aspects, such as the manufacturing, testing, programming or coding of technology.

Furthermore, the scope of this research study extends to cover not only the adoption and use of e-government services but also to cover Internet penetration and use within older adults. The Internet is the main, if not the sole, channel by which citizens receive online government services which means in order for an individual to be e-government services adopter he or she must adopt the Internet first. Therefore, for the sake of reaching a better understanding of the issues and effects that surround the e-government services adoption by older adults, it was crucial to include the Internet component.

To inform readers, the web portal of the Saudi Ministry of Interior (MOI e-portal) is the website being examined against the factors of the theoretical model of this research study. It is a major e-government services provider for citizens in the Kingdom of Saudi Arabia that encompasses various governmental bodies, such as civil affairs, traffic, and passport departments. Further reasoning and justification on why the MOI e-portal had been chosen for this study will be provided in chapter three.

As mentioned earlier in the aim statement, this research study takes place in the Kingdom of Saudi Arabia. However, to ensure that an in-depth perspective and understanding can be obtained, this research will be focused on the research site of Hail city. The selection of Hail city as the location of the study will be justified in chapter three, and more detailed information on the city will also be provided in the same chapter. In addition, as the targeted audience for this study is the older adults population of Hail city, participation in the survey will be limited to individuals of the age of 50 years old and above.

1.4 Research Approach

In order for this research to fulfill its aim and objectives stated previously, and to produce the intended contributions, a valid and sound research approach must be properly applied. This section will briefly familiarise readers with the adopted research study approach.

Generally, there are two major research paradigms. The first is positivism vs. interpretivism; the second is positivism vs. constructivism. Positivism views the world objectively in which science offers clarification and description in the form of common laws (Punch, 2014). On the other hand, interpretivism looks into the world in a subjective manner in an attempt to understand a phenomenon where the concentration is on the meanings participants bring about (Orlikowski & Baroudi, 1991). Finally, constructivism is "realities are apprehendable in the form of multiple, intangible mental constructions, socially and experientially based, local and specific in nature" (Gupa & Lincoln, 1994, p.110). For this research, the researcher has a structured, rigid impression of the world (ontology), and believes that positivism is applicable to this research where a scientific approach involving identifying factors and testing them is best suited to study this problem. The identified factors are the key components of the conceptual model and usually

presented either graphically or in narrative form diagrams (Miles & Huberman, 1994). More information and explanation regarding this research's conceptual model and factors will be provided in chapter three.

In the area of e-government and technology adoption, various researchers have used various methods to conduct their studies (Al-Sobhi, 2011). However, there are three common approach strategies by which researchers can accomplish the intended goals and objectives of their research studies. The approaches are qualitative, quantitative, and the third is a mix of both (Bryman & Bell, 2007; Creswell, 2003; Avison et al. 1999). Interpretivism and constructivism are mostly associated with qualitative approaches, while positivism is typically associated with quantitative methods (Punch, 2014). The qualitative approach is popular for complicated phenomenon as it gives researchers the ability to deeply analyse collected data by dealing with words and the meaning within words and data (Myers, 1997). In such approach, data is normally gathered by adapting the techniques of interview and observation. As for the quantitative approach, collected data is analysed and interpreted using statistical and mathematical techniques. Therefore, the quantitative approach normally employs the techniques of surveys and questionnaires (Denscombe, 2003). The key differences between the two approaches of qualitative and quantitative are the data collection techniques as well as the level of analysis. As mentioned earlier, this research study applies a positive scientific approach in which a quantitative approach involving developing and distributing survey questionnaires is the data collection method. The use of the survey questionnaires is justified because this method is proven to be of high convenience and accessibility as well as its efficiency in terms of cost and time (Gilbert, 2001). The questionnaire applied consists of general background questions as well as close-ended, 7 Likert scale questions. Finally, the model was anlysed and tested using SmartPls software package. This software applies the analysing technique of Partial Least Squares based Structural Equation Modeling (PLS-SEM). justifications on the reasons behind choosing PLS-SEM and SmartPls will be given in the research methodology chapter (chapter 3).

1.5 Contributions of this research

By completing this research, the contributions of this research are viewed to be:

For academia, after conducting literature review, it was found that minimal studies of Saudi Arabia, more so, of Internet use, e-government and older adults existed, which suggested a research gap exists. Saudi Arabia is a leading country in the Middle East and Arab world in terms of economy and technological infrastructure advancements. It is however encountering, more than ever, acceleration in aging population, which indicates the significance and practicality of age-related studies. Thus, this study should add to existing academic research by providing more knowledge and awareness of older adults and technology use, specifically the Internet.

The contribution of this research also includes developing a valuable theoretical conceptual framework and hypotheses. The conceptual framework and hypotheses will be dedicated to

examine and understand factors of influence with regards to older adults' intentions to use e-government services in Saudi Arabia. The outcomes of this study are anticipated to lead to a better understanding of the digital divide and its impacts on e-government services using the example of a population drawn from a marginal, socio-demographic group of Saudi Arabia.

For policymakers It was identified that most studies have been conducted at the national, rather than at local/state, provincial level. This study has paid attention to that issue and provided insights from a vicinity of Saudi Arabia, Hail City and provided a deeper insight from a sample population that is not emphasised in e-government research. Therefore, this study attempts to identify ways that the e-government portal can become more pronounced within one group of society, the older citizens. Having stated the value of this research for policy makers in terms of the older adults, the outcomes of this research can also be extended and widened to profit from when regarding other segments of society (e.g. younger citizens). In summary, the research identifies the eminent role of government authorities in bridging the gap between the older adults (users) and the ICT service providers (companies). Therefore, knowledge and information that can be of assistance to the e-government policy makers will be provided.

For industry & practitioners, this study identifies factors that private sector providers could use when providing particular online goods and services within the Saudi Arabian community. The contributions are also provided for Internet service providers who seek to increase their customer numbers. This is necessary for organisations in order to increase profits; therefore, by highlighting and identifying the issues that older adults in Hail city face when seeking online products and services, this research can inform Internet service providers in order to overcome the issues related to them.

Further, in terms of e-government, Bélanger and Carter (2012) identified that practitioners show a high interest in e-government. For example, the IBM Center for the Business of Government supports research efforts that provide "insightful findings and actionable recommendations for government executives and managers, with several strategic areas focused on the use of information and communication technologies" (Breul & Kamensky, 2011, p. 3). Therefore, this work is foreseen to be leading to interest from e-government practitioners into the factors that older adults specifically in a Middle Eastern country would favour, or not.

1.6 Dissertation Outline

Previous sections of this chapter briefly identified many important parts of the research. Some of these parts will also be further elucidated in the following chapters. To inform readers, this dissertation comprises of seven chapters and the following table 1.1 is an overall description of what each chapter contains. A diagrammatic illustration of the dissertation flow and structure is provided in figure 1.1.

Table 1.1 Dissertation Chapters Narratives	
Chapter 1	The first chapter commences with a background to the research problem followed by statements of the research aim, objectives and questions. Then the scope of the research is given, followed by the approach by which the dissertation will fulfill its aim and address its questions. Next, the dissertation outline section graphically describes the research flow.
Chapter 2	This chapter will include a comprehensive review of related IS literature covering topics such as older adults, e-government, digital divides and technology adoption models and theories with a specific concentration on the context of developing and Arab countries. Chapter 2 is then concluded with a section that explains how the conceptual theoretical framework for the study is developed, what theories are used, and what hypotheses are proposed.
Chapter 3	This chapter explains various well-recognised research philosophies and methodologies with emphasis on what this research applies. It will also provide detailed information on the techniques used in terms of data analysis and validation methods and procedures.
Chapter 4	This chapter explains the applied model for the pilot phase along with resulted quantitative pilot outcomes. This is followed by the lessons learned from the pilot and how the final survey is improved accordingly.
Chapter 5	The main findings and outcomes of this research are presented in this chapter. Analysis of the final model that is designed to study the adoption and use of e-government in Hail city will also be discussed along with the proposed hypotheses tests results.
Chapter 6	It begins with a discussion section that positions the findings within the context of existing literature consulted in chapter 2. Then it gives the results of a summative evaluation in terms of the outcomes of hypotheses testing and research impact on participants' behaviour, attitude and/or intention.
Chapter 7	It gives an overall picture of the findings, contributions and implications of this research. It also discusses research limitations, recommendations and provides future directions in the area of e-government and Internet adoption by older adults.

1.7 Thesis Structure Flow Diagram

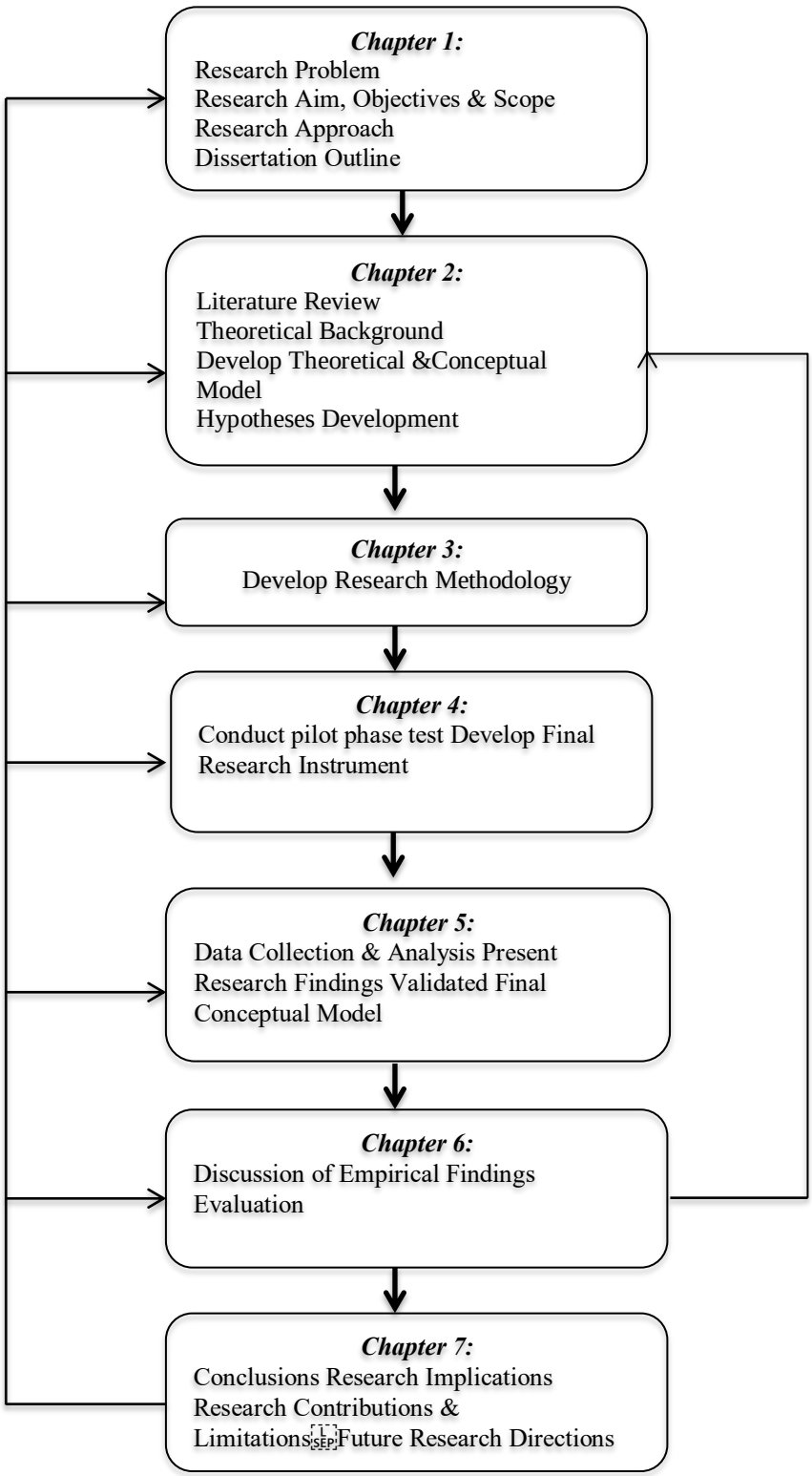


Figure 1.1 Thesis Structure Flow Diagram

1.8 Chapter Summary

This chapter is intended to inform readers of the main milestones of the dissertation. It initially started with an introductory to the research problem, which was the motive for the researcher to conduct the study. It was found that there is only minimal literature concerning e-government, older adults and ICT, and when ascertaining whether these topics were considered in Saudi Arabia, it was even less pronounced, which suggested the existence of a research gap. This disparity motivated the researcher to form the aim, which is to identify, explain and understand the adoption, use and diffusion of e-government services within the older adults population (50+) of a vicinity in Saudi Arabia, namely, Hail city. This was then followed by objectives to be accomplished and questions to be answered of the research. The scope of the research was then given to define the extent and limitations of the research, and to highlight the boundaries the research revolves within. Next was specified the adopted research approach by which the aim, objectives can be fulfilled and contributions can be realised. Finally, an overall description of the contents of all seven chapters as well as a diagrammatic illustration of the dissertation flow and structure were provided.

Having identified the key components of this research, such as problem, aim, questions and approach, the path is now paved to move to the second chapter, which is the literature review chapter. Reviewing the literature means shedding light on already existing knowledge within literature of relevance to the current research topic. In this case, research areas such as, e-government, digital divides, older adults, and developing countries will definitely be included when reviewing existing literature. This will then be tailed with a comprehensive review of the technology-related theories and models that have formed the basis for the development of a theoretical conceptual framework and hypotheses for the current research.

Chapter 2

Literature Review & Conceptual Theoretical Development

2.0 Introduction

After providing research introduction, aims, objectives and scope, this chapter provides the literature review and the theoretical foundation of this research. It starts with section 2.1 where definitions of the key terminologies used throughout the research are provided. Then section 2.2 is designated to the literature review in which a comprehensive picture of already conducted research on the same topics and areas are covered to form a rigorous understanding of the context surrounding the current research. This is followed by section 2.3 in which a theoretical background is offered by highlighting and explaining some of the well-recognised theories and theoretical models within the literature of IS, technology adoption and social science. This chapter goes on to illustrate in a detailed manner in section 2.4 on the theoretical and conceptual foundation upon which the model of the study and its constructs was built. The proposed hypotheses are then identified in section 2.5 along with in-depth discussion of the chosen constructs. Socio-demographic variables that are used for comparative analysis are then identified in section 2.6. Lastly, section 2.7 provides a summary that concludes information and content provided in the second chapter of this thesis.

2.1 Research Terminologies Definitions

Readers will come across many terms and concepts whilst reading throughout this research study; thus, it is useful to provide clear and comprehensive explanations of such terms and concepts. This section is therefore intended to provide definitions and descriptions of the key terminologies and concepts used for this research, which are within its scope. It was noticeable that literature does not always offer unanimous definitions and understandings of some of the terminologies. However, it is the intention of the researcher to cover and include, as much as possible, information from renowned and reputable journals, sources and scholars within the domain of information systems. To inform readers, this section will also provide some related statistics in conjunction the highlighted concepts in which the provided statistics will be directly related to the geographic location where this research study is conducted.

2.1.1 E-government

It is believed that the concept of e-government has emerged in the last decade of 20th century where governments provide public services with the support of electronic information technologies (Caldow, 1999). Although widely used in literature, there is no single unified definition of e-government. Heeks (2006) narrated this concept as a combination of human and technical information systems for governing bodies of a country. A more comprehensive and promising definition of e-government is given by Carter and Belanger (2005), in which e-government is "the use of information technology to enable and improve the efficiency with which government services are provided to citizens, employees, businesses and agencies"(p.5). Another direct and explicit definition statement of e-government was offered by Norris et al. (2001) in which e-government is "the delivery of services and information, electronically, to businesses and residents, 24 hours a day, seven days a week"(p.3). Looking at it from a different angle, e-government simply occurs when a government applies the methods and tools of electronic commerce (e-commerce) to its work and activities with the aim of serving citizens and/or other governmental bodies (Howard, 2001). Finally, the World Bank (2015) defined e-government as "the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government". Giving the fact that this research is intended to study the influential factors on the intentions of older adults citizens in terms of the use of e-government services over a web-based portal on the Internet. The best-suited definition was given by (Palvia & Sharma, 2007) in which e-government is "a generic term for web-based services from agencies of local, state and federal governments. In e-government, the government uses information technology and particularly the Internet to support government operations, engage citizens, and provide government services. The interaction may be in the form of obtaining information, filings, or making payments and a host of other activities via the World Wide Web" (p.1).

Further, e-government is known for the significant advantages it can bring to individuals and societies alike. Figure 2.1 displays the notion that governmental agencies and institutions can use the concepts of e-government to spread its reach to the extent of the wider e-Economy. Giving the changes in the larger economy and society alike, and as a natural revolution, it is inevitable for governments to respond by introducing and expanding e-government services until this simply becomes the way things are done (ibid). As for the benefits and objectives of e-government, the main aim is to create transparent, effective and convenient online interaction channels between the government and other beneficiaries (Klabi et al. 2016). E-government is also viewed as a powerful tool with the potential to effectively tackle or at least minimise the problems of conventional public administration and development. This is can be achieved by using e-government as a tool to strengthen government performance and enhance public administration, which consequently will positively reflect upon economy and social development (Schuppan, 2008). The application of e-government can also boost and maximise transparency, accessibility and revenue growth on one hand whilst reducing corruption and cost on the other hand (World Bank, 2015).

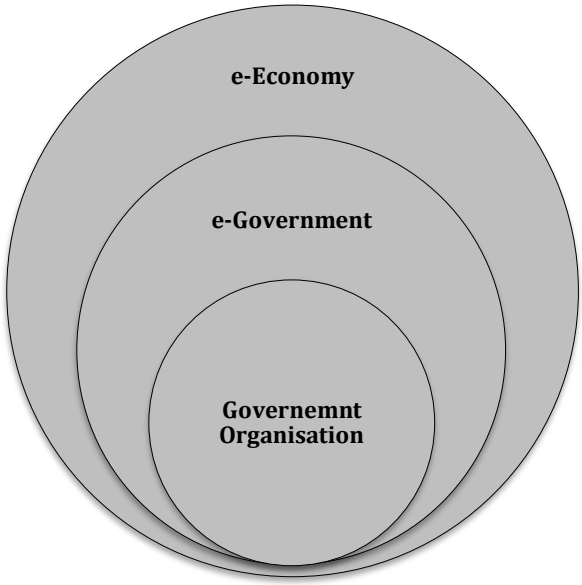


Figure 2.1. e-Government In The Economy (Howard, 2001, p.6)

E-government can take several forms based on the recipient of the service. However, the main four modalities are:

Government to government G2G: regards the relationship between various governmental bodies in different government levels within the state. Such interaction and collaboration is crucial in order to promote citizen-centric services, and usually take the form of database and resource sharing (World Bank, 2015).

Government to business G2B: regards the relationship between the government and the private sector. Such technologically advanced relationship offers businesses with the opportunity to simplify regulatory procedures; thus, increase competitiveness (ibid).

Government to citizens G2C: regards the relationship between government and its citizens. G2C provides citizens with great advantages and benefits, including 24/7 availability, enhanced services, increased convenience and efficiency. This form of e-government is considered of most importance in which the whole idea of e-government eventually revolves around making e-government citizen-centric (ibid). G2C is the form of e-government this research study concentrates on.

Government to employees G2E: regards the relationship between the government and its employees. This type involves facilitating the administration of internal communication as well as processing system paperless procedures (Fang, 2002).

To inform readers, table 2.1 below provides an overall picture of state of e-government ranking worldwide as of 2016. Then, the next table 2.2 depicts similar information on the Gulf region and some Arab and Middle Eastern countries. According to the United Nations e-government survey (2016), Saudi Arabia, where this research is conducted, came 44 worldwide with high E-government Development Index, but relatively lower Telecommunication Infrastructure Index.

Table 2.1. World e-government leaders

Country	OSI*	TII**	EGDI Level ***	2016 Worldwide Rank
United Kingdom	1.0000	0.8177	Very high	1
Australia	0.9783	0.7646	Very high	2
Republic of Korea	0.9420	0.8530	Very high	3
Singapore	0.9710	0.8414	Very high	4
Finland	0.9420	0.7590	Very high	5
Sweden	0.8768	0.8134	Very high	6
Netherlands	0.9275	0.7517	Very high	7
New Zealand	0.9420	0.7136	Very high	8
Denmark	0.7754	0.8247	Very high	9
France	0. 9420	0.7502	Very high	10

* OSI stands for Online Service Index / 1 is the highest value
** TII stands for Telecommunication Infrastructure Index / 1 is the highest value
***EGDI stands for E-government Development Index
Source: United Nations Department of Economic and Social Affairs (2016)

Table 2.2. Overview of E-government Status in the Arab World and The Middle East

Country	OSI*	TII**	EGDI Level ***	2016 Worldwide Rank
Bahrain	0.8261	0.7762	Very high	24
United Arab Emirates	0.8913	0.6881	Very high	29
Kuwait	0.6522	0.7430	High	40
Saudi Arabia	0.6739	0.5733	High	44
Qatar	0.6739	0.6041	High	48
Oman	0.5942	0.5147	High	66
Turkey	0.6014	0.3775	High	68
Lebanon	0.5145	0.4911	High	73
Libya	0.1087	0.4291	Medium	118
Yemen	0.1449	0.1465	Low	174

* OSI stands for Online Service Index / 1 is the highest value

** TII stands for Telecommunication Infrastructure Index / 1 is the highest value

***EGDI stands for E-government Development Index

Source: United Nations Department of Economic and Social Affairs (2016)

2.1.2 Digital Divide

It is frequently believed that the modern day societies are information societies, in which integration, manipulation, use, diffusion, distribution and creation of information are important cultural, political and economic activities (Neves & Amaro, 2012). However, the adoption and success of information and communication technologies might be disturbed by social exclusion and aging problems, which creates digital divides in societies and countries (ibid). The revolution of digital technologies has created digital divides all over the world. There has been a definite inhomogeneity among and even within nations as a result of the introduction of new advanced ICT (Antonelli, 2003). The original notion that digital divide solely depends on the physical availability of computers and connectivity is no longer valid (Warschauer, 2004). The digital divide is actually marked by other additional resources, such as education, content, literacy, language and community resources. This digital divide is debatably a huge force of isolation in today's societies as a generation of citizens and children will grow old without having the capabilities, tools and skills to embrace these digital technologies. The only way to solve and/or avoid this possible dilemma is to make it a national priority by governments (ibid).

The digital divide has a variety of definitions based on the various factors and sources of the divide. Factors range from Infrastructure access, geographic location and socioeconomic status to gender, age, race, religion and disability (Barzilai-Nahon, 2006). Sipior et al (2011) define the digital divide as "the divide between those with access and skills to use the Internet and new ICT and those without, or in other words, the gap between the 'technology haves' and 'have-nots" (p.310). Hwang (2006) suggests that "the digital divide (or the global digital divide) is generally referred to as the 'uneven diffusion' or 'gap' or 'disparities' between different socio-economic levels or across countries or between developed and developing nations in terms of 'access' and 'use (usage)' in ICTs" (p.19). Having stated some "broad" definitions of the digital divide, and for the purpose of this study, the definition stated by Anheier & Toepler (2010) is adopted. They believe that the digital divide "typically means Internet access, but the term has been broadened to include other information and communications technologies (ICTs)" (p.605). This means that the divide takes place mainly when individuals or groups or even nations do not have Internet access what ever the reasons are. This particular explanation of the digital divide is best suited for this research study because Internet adoption by older adults is a major part to be investigated.

As mentioned above that the digital divide can be characterised by many different factors, including infrastructure access, geographic location, socioeconomic status, age, race, religion and disability. However, in order to relate the issue of digital divide to the purpose of this study in which older adults are the society segment to be studied, the factor of age will be heavily discussed and emphasised. In literature, age has always and repeatedly been identified as a major cause of digital divide (Klotz, 2004). For instance, older adults tend to label the Internet as a non-essential technology to them because they have lived long without the need to use it. Over and above, amid such negative or more precisely 'indifferent' perception of the Internet, and as age increases, other issues emerge which

discourage older adults to adopt the Internet and its related technologies, such as computers. These are the health-related factors by which the use of some technologies becomes challenging; and thus unfavourable. It is vastly common for example within the older adults groups to suffer from eyesight decline and arthritis, which makes it difficult to view computers' monitors and control mouse cursors. Therefore, such use difficulties have created a significant age-based digital divide between older and younger generations, and has made age a decisive deterrent aspect for technologies, especially the Internet to prevail and abound (Klotz, 2004). Finally, digital divide is included in this study because of its direct eminent impact on e-government adoption. As mentioned earlier in chapter one, the Internet is the key vehicle governments are using to deliver services to their citizens. Ironically, people who are the main beneficiaries of services provided online by government are the least able to deal with advanced ICTs, including the Internet (Dugdale et al. 2005).

2.1.3 Information and Communication Technologies ICTs

To ensure a better understanding of the term 'ICT' is reached, it is important to shed light on the term 'technology' first. One of the early definitions was given by MacKenzie and Wajcman (1985) who viewed technology as "the integration of the physical objects or artefacts, the process of making the objects and the meaning associated with the physical objects" (MacKenzie and Wajcman (1985) as cited in Wahab et al. 2012). Maskus (2004) provided a comprehensive definition in which "a technology may be defined as the information necessary to achieve a certain production outcome from a particular means of combining or processing selected inputs. Many technologies may generate the same outcome but they may differ in terms of their efficiency. And a given technology may generate multiple outputs. A technology may be quite specific or it may encompass several sub-processes, such as producing intermediate inputs within an overall value chain. Technologies may be particular production processes, intra-firm organizational structures, management techniques, means of finance, marketing methods, or any combination of these. All contribute to the productivity with which outputs are generated from inputs and to the market value of those outputs" (p.9).

Today, the world is living in the era of information where institutions and societies alike use technology at the heart of their operations (Kroeker, 2010). Various communication networks are disseminated across the world to carry out information at extraordinary speeds; these networks are known as information and communication technology networks (ICT) (Freeman & Hasnaoui, 2010). ICT networks enable immense bulks of information to be transferred in a blink of an eye by which humans' life has been immeasurably advanced. The applications of ICTs in today's life are endless, including but not limited to real time communication across cities, countries and even continents, facilitating speedy calculations and mathematical assessments, improving safety via the tracking of air, marine, and ground traffic, boosting international trade and across borders business (ibid). ICT is a domain that "includes technologies such as desktop and laptop computers, software, peripherals, and connections to the Internet that are intended to fulfil information processing and

communications functions" (Statistics Canada, 2008 as cited in Freeman & Hasnaoui, 2010, p. 4). Another description of ICT is offered by UNESCO (2002), in which ICT is "the combination of informatics technology with other, related technologies, specifically communication technology" (p.12). In addition, for the purpose of this study, where Internet adoption and computer use are being examined, one of the most appropriate definition of ICTs is "In general ICT refers to the permanent accessibility, availability, reliability, and efficiency of computers, phones and the various networks that link them" (Detschew, 2008, p.28).

2.1.4 Technology Diffusion and Adoption

For many multiple disciplines, the subjects of technology adoption and diffusion as well as the time frame involved in the adoption and diffusion process have been a rich source of research and scientific investigations (Straub, 2009). Whether it is a business, educational institution or one's everyday life, this decision of whether to adopt a technology or not comes with impacts. While decisions regarding incorporation and use of technology are repeatedly made at a higher level, such as an educational institution or local government or state level, a successful execution greatly depends upon the patterns of individuals' adoption (ibid). While many people use the two terms of technology adoption and technology diffusion interchangeably, this research distinguishes them from one another.

Contrary to a new technology invention, which usually tends to take place as a one single occurrence, the diffusion of that technology tends to be a long time-consuming and constant process (Hall & Khan, 2002). Nevertheless, diffusion is what matters not the invention with regards to gaining the benefits of the new technology, which will not be fully recognised until the number of adopters reaches a certain level. A good statement on the characteristics of diffusion was given by Nathan Rosenberg (2007), "in the history of diffusion of many innovations, one cannot help being struck by two characteristics of the diffusion process: its apparent overall slowness on the one hand, and the wide variations in the rates of acceptance of different inventions, on the other" (cited in Hall & Khan, 2002, p.3). Therefore, in order to understand how technological transformation occurs and the reasoning behind its slowness, it is fundamental to comprehend the mechanisms of the diffusion process. Over the years, various researchers and scholars offered various definitions of technology diffusions. An early definition was given by Stoneman (1976) in which technology diffusion is "the process from the start to the completion of the change in technique process" (p.6). Robertson & Jacobson (2011) provided another definition in which technology diffusion is "the spread of knowledge from an original source or sources to one or more recipients" (p.1). Finally, one of the most renowned definitions of diffusion was offered by Rogers (1995) where he defines it as "the process by which an innovation is communicated through certain channels over time among the members of a social society". In fact Rogers is known for his theory named Diffusion of Innovation (DOI), which aims to justify and understand user acceptance of new technologies (innovations). The use of this theory is largely widespread in the domain of information systems literature. DOI suggests that an innovation is influenced by five major constructs, which are relative advantage,

complexity, compatibility, trialability and observability. This research also applies some of the constructs of the DOI theory, which are believed to be serving the purpose of this research.

As for technology adoption, it is defined as "the choice to acquire and use a new invention or innovation" (Hall & Khan, 2002. P.1). Another definition provided by Rogers (1983) where he describes adoption as "the process through which organisations or individuals decide to make full use of an innovation in their daily businesses". Further, Hultman (2004) looked at technology adoption from an organisational angle where adoption refers to the collective process through which a firm decides whether to adopt or reject a certain technology.

In conclusion, adoption is viewed to be a personal decision in which the action of adoption takes place once an individual decides that the best available behaviour is to fully accept and use the new technology. Further, the rejection to use the new technology is also considered a decision "not to adopt" (Rogers, 2003). Therefore, in terms of this research and to reach a better understanding, both the factors encouraging adoption and the factors encouraging non-adoption will be studied. To further explain adoption, the following figure 2.2 depicts the main stages and aspects of the adoption decision-making process.

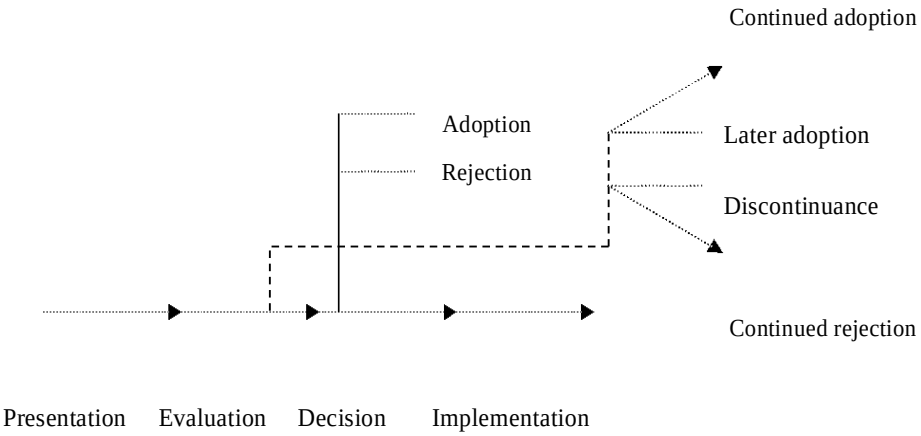


Figure 2.2. Adoption decision-making process

From the previous demonstration of the various definitions and attributes of both terminologies technology diffusion and technology adoption, it is valid to state that diffusion is related to the spread of a given technology whereas adoption has more to do with one's decision whether or not to accept and use that technology. Figure 2.3 below graphically illustrates the difference between both terms in which the accumulative adoption decisions made by individuals make the diffusion curve to occur and formulate slowly over time.

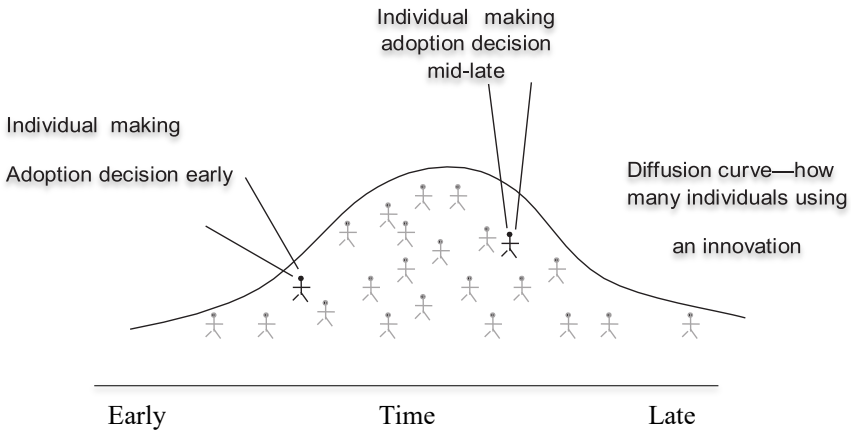


Figure 2.3. How individual adoptions compose diffusion (Straub, 2009, p.627)

2.1.5 Overview of Households

Although the context of households has become essential in technology adoption literature, addressing households' perspectives in technology adoption research is still inadequate (Brown & Venkatesh, 2005). This inadequacy is even more noticeable in the context of developing nations literature; thus, this research will contribute to households' technology adoption and use literature by applying households as the sampling unit. Like most concepts and terminologies related to IS and adoption studies, there is more than one definition and description for the household concept. For instance, Haviland et al (2010) describes a household as "the basic residential unit where economic production, consumption, inheritance, child rearing and shelter are organised and carried out" (p.240). Further, The United Nations Statistics Division (2014) provided two definitions on its website based on the number of the household head. First, "A one-person household, defined as an arrangement in which one person makes provision for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household". Second, "A multi-person household, defined as a group of two or more persons living together who make common provision for food or other essentials for living". As for the study in hand, the definition given by The National Centre for Social Research (2001) is considered to be the most appropriate one for the purpose of the study in which a household is "one person or a group of people who have the accommodation as their only or main residence" (p.58).

Having defined the household concept, following is some statistical data pertaining to ICT adoption, penetration and use within worldwide households and Saudi households. Figure 2.4 suggests that in 2017 the proportion of worldwide households with Internet access was

only 53.6% whereas in developed countries it reached as high as 84.4%. However, the proportion of households with Internet access was only 47.2% in Arab states, and as low as 14.7% in least developing countries which clearly indicates the existence of a huge divide in technology use and diffusion among and within many Arab and least developing nations. As for the context of this research, which takes place in Saudi Arabia, a major Arab country, the status of Internet penetration among households is much better than many neighbouring Arab and developing countries. Figure 2.5 below shows that as of 2016, more than 80% of Saudi households were in possession of the Internet. However, this relatively high percentage is only representative of the households population; thus, does not necessarily negate the existence of a larger digital divides within individuals. Table 2.3 which pertains to the telecommunication Infrastructure components within Gulf Countries actually shows that the percentage of Saudi individuals using the Internet was only 63.70% in 2016, which is lower than all other Gulf countries. For readers' information, in 2016, the total population of Saudi households was 3.417.788 with 20.064.970 residents (Saudi General Authority for Statistics, 2016). Having covered the concept of households, next is an overview of older adults, which is the analysis unit for this research.

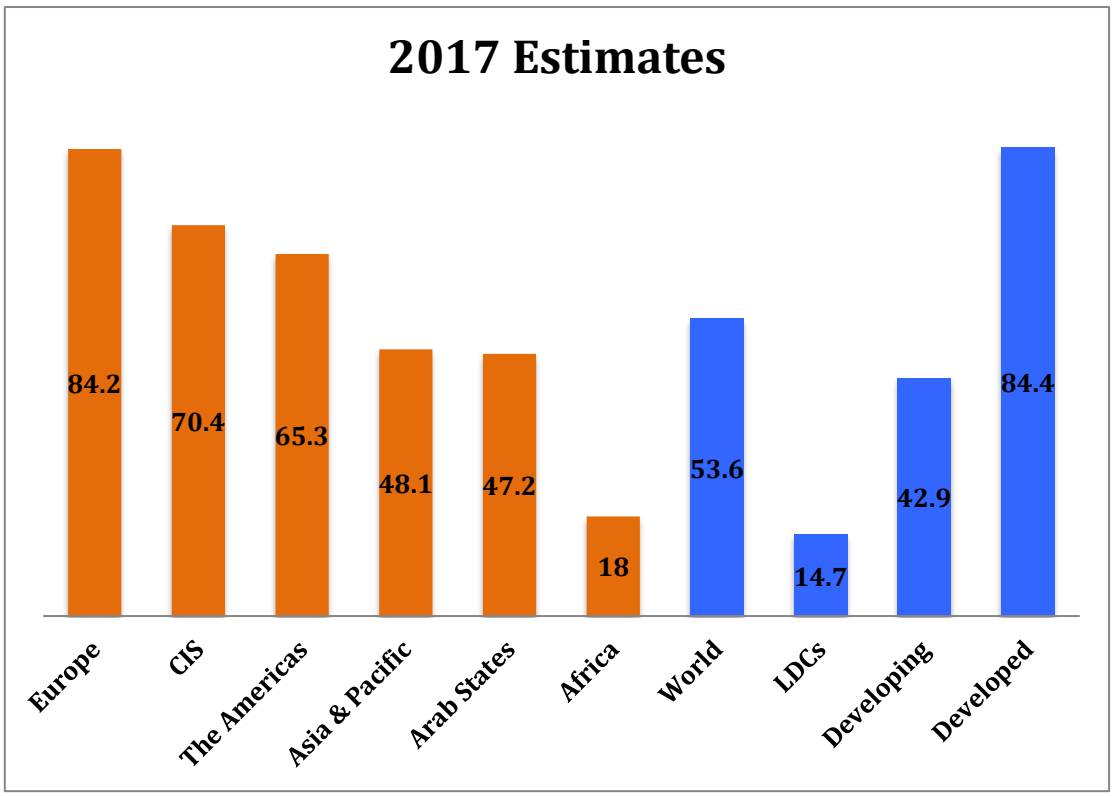


Figure 2.4. Proportion of households with Internet access (ITU, 2017)

* CIS refers to the Commonwealth of Independent States.

* LDCs refers to least Developing Countries

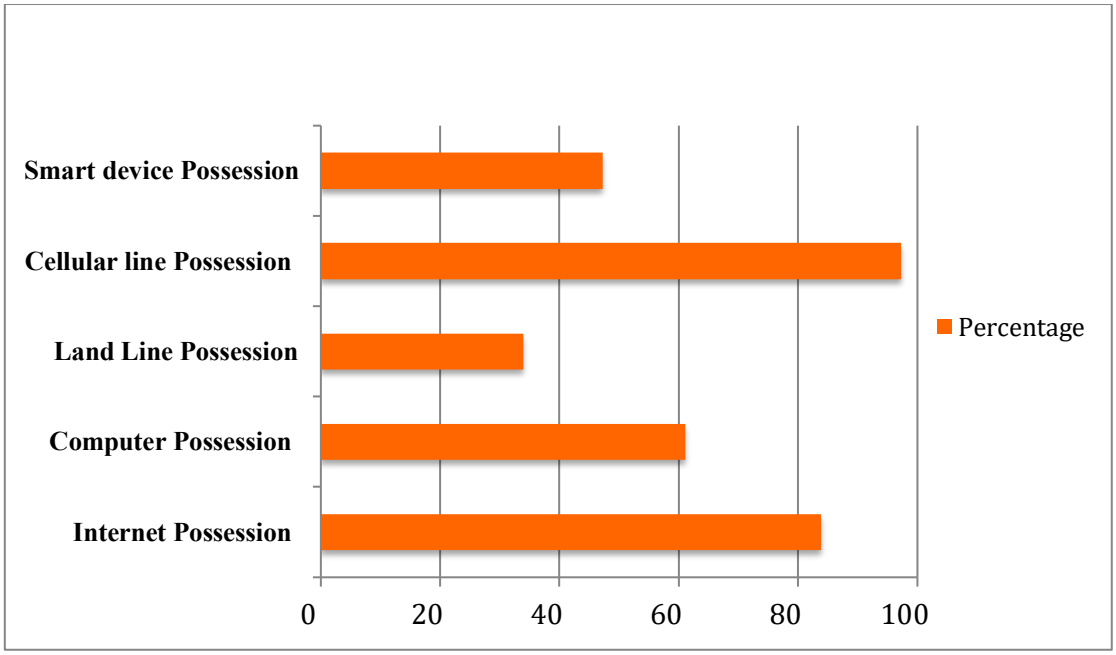


Figure 2.5. The Penetration rate of some ICTs within Saudi Households (Saudi General Authority for Statistics, 2016).

Table 2.3. Telecommunication Infrastructure components - Gulf Countries

Country	Percentage of Individuals using the Internet	Fixed telephone subscriptions per 100 inhabitants	Mobile cellular Telephone subscriptions per 100 inhabitants	Fixed (wired)-broadband subscriptions per 100 inhabitants	Wireless broadband subscriptions per 100 inhabitants
Bahrain	91.00	21.18	173.27	21.39	119.00
Kuwait	78.70	14.20	218.43	1.38	139.80
Oman	70.22	9.56	157.75	4.51	68.90
Qatar	91.49	18.41	145.76	9.90	76.80
Saudi Arabia	63.70	13.36	179.56	10.36	70.60
United Arab Emirates	90.40	22.26	178.06	11.51	89.10

Source: United Nations Department of Economic and Social Affairs (2016)

2.1.6 Older Adults

It might be indisputable that information and communication technologies ICTs have brought about prosperity and advancement to humankinds. However, the introduction and advancement of ICTs have also brought about division among individuals, groups and even nations. This division is widely known as the digital divide. According to The United Nations Department of Economic and Social Affairs (2016), many vulnerable and disadvantaged individuals and groups suffer from that divide, including poor people, elderly people, people with disabilities, immigrants and others. However, this research will only study the vulnerable group of older adults by examining two ICT related dimensions; first, the Internet divide and its characteristics, and second the factors influencing intentions to use e-government services. Therefore, it is important prior to proceeding further with the research to demonstrate the different definitions of the concept of older adults, and to clearly specify the definition this study applies.

Many people experience health related declines in their fifties, therefore, older adults can be defined as the people who are of the age of 50 years and above (Hanson, 2009). The World Health Organization (WHO) (2015) stated that the definition of older adults differs within countries, with developed countries viewing older adults as individuals who receive pension aids, whereas in the developing world this definition is not necessarily realistic. In Africa for instance, the WHO in one of its projects adopted the definition of older people being 50 years old and above for the sake of more accurate results. For Saudi Arabia being a developing country, it is declared at this point that for the purposes of this research, older adults are identified as individuals in the age ranges of 50 years old and above.

Older adults have been chosen as the audience to be studied in this research for two reasons. The first reason is the fact that elderly people are considered a vulnerable segment within societies who are left behind in technological isolation which deprives them from gaining the benefits of ICTs, especially the Internet and e-government services. Earlier, it was mentioned that ICT are advancing and awareness of their potential for older adults has become apparent. For example, elderly people can enjoy better mental simulation, enhanced memory capabilities and increased social interaction by using computers, Internet and other ICT components, such as the social media (Czaja & Schulz, 2006). It is also commonly believed that the use of computers and Internet-based facilities can enhance elderlies' self-esteem and cognitive abilities. In addition, learning and using new information technologies help elderlies to be more independent and less isolated (Czaja & Schulz, 2006; Niehaves & Plattfaut, 2014). Further, e-government is also a promising domain for older adults as it can assist in providing improved and dedicated services by which older adults can confront exclusion, isolation and poverty (Information Daily, 2006; The United Nations Department of Economic and Social Affairs, 2016). Alongside e-government can also assist in improving the health of elderly by providing related online health services (Information Daily, 2006). All of the aforementioned advantages and benefits of ICT adoption and use lead to improvements in the quality of the life of elderlies.

Therefore, it is necessary to ensure the availability and usability of Internet and other related information technology services for older groups in order to socially include and integrate them within society (Becker, 2005).

Secondly, older adults are important individuals within societies who desire to feel included and valuable in order to accomplish "successful ageing" (Fenton & Draper, 2014). Unfortunately, there is a widespread notion that older people offer only limited contributions to their societies whereas in reality, older adults offer large economic and social contributions. In the UK for instance, adults aged 65+ contributed to the economy an overall sum of £40 billion in 2010. This is credited to their spending habits and the value of their volunteering (ibid). Further, in terms of societal aspects, older adults offer significant contributions to their communities and neighbourhoods due to their continuous and enthusiastic involvement in the places that they reside in. In addition, older people have more tendencies to volunteer and participate in community-based institutions (ibid). Older adults are also known for their accumulative knowledge and skills gained throughout life experience which enable them to contribute to the economy in terms of employment, entrepreneurship and holding large amounts of wealth in society (ActiveAge, 2010; North & Fiske, 2015). By combining these factors and capabilities of the elderly there is a clear indication of the potential that older adults have in terms of promoting communities, improving and building community capacity (ActiveAge, 2010).

As this study is elderly-centric, it is useful to provide some related statistical data on their population. The world is experiencing acceleration in the elderly population in a phenomenon known as the "population ageing" (United Nations Population Division, 2017). This phenomenon is a direct result of the increase in life expectancy and the decline in fertility rate. Statistics depicted that as of mid 2017, the population of older adults comprised about 15% of the total worldwide population. It is also projected that older adults population will reach over 2 and a half billion by the year 2050 (ibid). As for the context of Saudi Arabia, which is the location of this research, statistics showed that as of 2016, citizens who are 50+ were approximately 2.800.000 persons comprising around 14% of total Saudi population (Saudi General Authority for Statistics, 2016). Table 2.4 below shows in details the distribution of the Saudi population by age groups and gender.

Table 2.4. Saudi Population by gender & age groups

Age Groups	Male	Female	Total
0-9	2.150.279	2.072.328	4.222.607
10-19	1.843.404	1.783.942	3.627.346
20-29	1.999.504	1.888.923	3.888.427
30-39	1.627.260	1.591.838	3.219.098
40-49	1.184.411	1.130.072	2.314.483
50-59	**767.476**	**715.820**	**1.483.296**
60-69	**391.789**	**395.330**	**787.119**
70-79	**177.705**	**171.247**	**348.952**
80+	**83.822**	**89.820**	**173.642**
Total	10.225.650	9.839.320	20.064.970

Source: Saudi General Authority for Statistics, (2016).

2.2 Literature Review

For a given research, literature Review is meant to provide a comprehensive picture of already conducted research on the same topics and areas. Reviewing the literature is an essential task for researchers because doing so assists in building upon the findings of previous research to form the foundation of the current research. Reviewing the literature also aids in choosing an appropriate research approach, study instrumentation, data analysis methods based on assessing the diverse research designs existed in literature (Walliman, 2001). A good definition of literature review was given by Hart (1998) in which it is "the selection of available documents (both published and unpublished) on the topic, which information, ideas, date and evidence written from a particular standpoint to fulfil certain aims or express certain views on the nature of the topic and how it is to be investigated, and the effective evaluation of these documents in relation to research being propose"(p13).

As for this study, a rigorous literature review has taken place by conducting a comprehensive search within well-known books, academic journals, and related conferences proceedings. Accordingly, around 150 related articles were studied in the effort of reviewing the literature to develop this study (see appendix 2-1). The literature review was divided into five sections, covering the key topics on which this research is built. It starts with a review of the topics of technology adoption and digital divide: followed by a review of e-government services in the developing world and in Saudi Arabia. The last section will summarise and discuss reviewed literature.

2.2.1 Technology Adoption

Since the early times of technology introduction, researchers have made considerable contributions to the venue of technology adoption literature. Throughout the years, many scholars have developed various theories and models by which technology acceptance and use can be examined. Some of these renowned theories and models include, but not limited to, the theory of reasoned action by Fishbein & Ajzen (1975), diffusion of innovation theory by Rogers (1983), the social cognitive theory by Bandura (1986), the technology acceptance model by Davis (1989), the theory of planned behavior by Ajzen (1991), IS success models by DeLone & McLean (1992, 2003), Model of Adoption in the Household (MATH) by Venkatesh & Brown (2001), Trustworthiness by McKnight et al. (2002), and the unified theory of acceptance and use of technology (UTAUT) by Venkatesh, Morris, Davis & Davis (2003). Most of these theories and models will be discussed in details later in this chapter.

As declared earlier, this research emphasises technology adoption within the context of households; thus it is imperative to understand households' perceptions and adoption patterns with regards to novel innovative technologies, especially e-government services. However, after an extensive review of technology adoption literature, it was found that although the context of workplace and organisations have been extensively researched and investigated, the households context has been noticeably disregarded (Venkatesh & Brown, 2001). Further, it was also found that this negligence is even more with regards to e-government adoption and use research within the context of households. However, this negligence of households research does not undermine its importance because this venue of research derives its significance from one simple fact that is much of technology adoption and use takes place in households (Brown, 2008). Therefore, the importance of households researches as well as the identified inadequacy of the households context within the literature of e-government adoption have motivated this research to be household-oriented. Following is a review of existing literature that is considered to be relevant to the topic of the current study.

In an important technology adoption study, Brown et al (2006) applied the model of adoption of technology in households (MATH) to investigate the adoption and use of personal computers PCs in the context of American households. Findings revealed that factors of influence on PC use include the work-related needs, attitudinal beliefs, fit to

personal use, and utility for children. On the other hand, factors related to normative and control beliefs were insignificant predictors of PC adoption.

Further, another technology of importance that is directly related to households' adoption literature is the broadband technology. This technology is viewed as the gate to many other venues of technology, such as e-commerce and e-government. It is also agreed that broadband Internet technology can remarkably enhance countries' economy, particularly in the developing world, by the positive changes it offers to the various public sectors of telecommunications, health and education (Dwivedi et al. 2007). A well-received study had employed the theory of planned behaviour TPB, the decomposed theory of planned behaviour DTPB and MATH endeavouring to examine the adoption issues of broadband Internet technology in the private residences (Choudrie & Dwivedi, 2006). Data was collected from 172 London household consumers. Empirical analysis found that hedonic outcomes such as perceived entertainment, utility outcomes such as work-related uses and relative advantages such as connection speed are adoption drivers factors. In contrast, the desire to use broadband in households is weakened by some behavioural control factors such as cost and lack of skills with regards to the use of broadband-related technologies. Further, given that this research took place in Saudi Arabia, which is a developing country, it is imperative to position this study into its suitable context. Therefore, the next review will be in relation to developing countries, which have relatively similar situations to Saudi Arabia.

A quantitative study of Malaysia investigated the behavioural intentions to adopt broadband by targeting mobile device users assuming that they are more likely to use broadband technology (Ooi et al. 2011). The theoretical model was based on constructs drawn form TPB, DOI and MATH. Findings indicated that, among other factors, there are three key determinants of whether or not to adopt broadband in Malaysia. These are: social influence of family members and/or friends, the perceived relative advantage of using broadband, and the perceived self-efficacy. The latter was found to act as the anchor element among the entire applied factors. Self-efficacy in the study concerns the capability and confidence level participants have in themselves when using broadband technology. In a more recent study took place in India, self-efficacy has also been identified to have significant influence on behavioural intention to adopt broadband (Manzoor, 2014). This study applied similar model to the Malaysian one in which it had drawn its model from TPB, DOI and MATH. Findings posited that in addition to self-efficacy, facilitating conditions, ease of use, service quality and hedonic outcomes such as perceived entertainment all have significant influence on Indian consumers' intentions to use broadband.

As for the context of Saudi Arabia, unfortunately, when considering technology adoption research, particularly Internet broadband technology, it has been found that there is only little to minimal literature. However, Dwivedi & Weerakkody (2007) conducted a relatively old study whereby reasons behind the relatively slow deployment of broadband in the country at that time had been explored. By developing and distributing survey questionnaires to potential participants, 138 valid and completed responses were acquired.

It was found that perceived usefulness, perceived service quality, age, connection type (e.g. dial-up, satellite) and accommodation type (e.g. home, work) were all major players in attitude formation towards broadband adoption in Saudi Arabia.

In another venue of technology adoption research, a recent study of Saudi Arabia empirically inspected adoption and use of smartphone technology (Aldhaban et al. 2016). In order to determine what theories and models to apply, qualitative methods such as brainstorming, focus group, and interviews were initially used. Based on the results of model validation, the theoretical background was eventually derived form the unified theory of acceptance and use of technology (UTAUT) where a random sampling technique had been applied for data collection. Further, using a web-based survey resulted in receiving back 641 completed questionnaires from smartphone users in Saudi Arabia. Findings indicated that with regards to the behavioural intentions to use smartphones, performance expectancy such as durability and battery life, effort expectancy such as design simplicity, brand influence and perceived enjoyment are major influencers on such intentions. The study has also established a strong positive association between social influence and the actual use of smartphones.

2.2.2 Older Adults & The Digital Divides

It is widely agreed that the adoption of technology could be affected by the social exclusion and aging problem as well as the role of digital divides in societies and countries (Neves & Amaro ,2012). Although technology is becoming increasingly invasive, this use of technology in different age groups is being underutilised. For example, the use of Internet is significantly more common among middle-aged individuals compared to elderly people. In this context, existing digital divide is restraining the elderly population from using modern sophisticated IT based tools by which their life quality could markedly improve. Examples of such life enhancing technologies include the health related equipment and Internet based delivery systems of different goods and services (Niehaves & Plattfaut, 2014).

Despite the importance of the technology and ICT adoption domains, there are only minimal academic research studies that have carried out a comprehensive analysis of Internet and technology adoption success within the older adult demographic groups of societies (ibid). However, the significance of technology inclusion and Internet adoption is being increasingly highlighted due to increased levels of ageing population and digital divides. It is therefore necessary to ensure the availability and usability of Internet and information technology for elderly groups in order to socially include and integrate them within society (Becker, 2005). The social exclusion problems and limitations that older adults face can be assuaged if they used computers and ICTs (Czaja & Schulz, 2006). For instance, the use of computers and Internet to interact with other people (e.g. social media) results in a better mental simulation and memory enhancement. Further, learning how to use new technologies, especially computers and Internet-based technologies can enhance their self-esteem and cognitive abilities, which in turn positively reflects on their quality of life. This adoption of ICTs might also open new horizons for elderly such that they might

be able to manage and deal with useful information services (ibid). Following is a review of important literature pertaining to the topics of older adults, technology adoption and the digital divides. Unfortunately, there has been identified a huge gap within the literature in the context of the Middle East and the developing world in general. Therefore, many developed countries' studies have been reviewed and included in an attempt to form a general understanding of older adults and technology adoption.

The elderly prefers to spend the 'old age stage' while living at their own homes. Various technologies can assist the elderly, in the context of community-dwelling, in maintaining better health conditions, longer independency and activeness (Peek et al. 2016). Aging at home was the context of a study conducted in the Netherlands to discover what influences older adults' adoption of diverse technologies at their households. A qualitative approach led to find that factors, such as independent living difficulties (e.g. health decline), personal perception about technology, social and organisational network impact (e.g. relatives, home carers, technology suppliers), behavioural options (e.g. gain assistance from others instead of using technology), and the physical environment (e.g. technological devices are considered too intrusive at home) play vital roles on the level of technology use by community-dwelling elderly. Accordingly, to achieve successful use of technology by the independent older adults at their homes, all involved constituencies should be aware of the abovementioned psychological and contextual elements (ibid).

Furthermore, motivated by the existing digital divide represented by the age-based underutilisation of IT, Niehaves and Plattfaut (2014) explored the elderly intentions to use the Internet in Germany. A theoretical framework that was composed of UTAUT & MATH had guided the development of a survey questionnaire in which 165 valid surveys were obtained from older adults participants 65+. The idea was to test both models to find out which is more powerful with regards to understanding the elderly adoption of Internet. Analysis showed that both models are excellent describers of the elderly adoption of Internet. However, in comparison, UTAUT was more feasible because of the lower number of items it contains, whereas MATH depicted superiority over UTAUT in terms of the explanatory power it offers in the research area of Internet adoption by the elderly. Further, the model was also moderated by four socio-demographic variables, which are age, education, gender and income assuming they are barriers to ICT adoption in developed countries. Results posited that the added socio-demographic variables could enhance both applied models' power to conclude whether older adults eventually adopt the Internet or not. In that context, many studies have examined the causes of digital divides and the various technological gaps, mainly the age-based divides and gaps, by comparing between the behaviours of young people and older adults. A recent study conducted in the United States to investigate the online shopping intentions by both, younger (<55) and older (>55) adults in the context of a major data breach (Chakraborty et al. 2016). The findings indicated that for both age categories, perceived online shopping risk is considerably influenced by the acuity of a hacking event. However, this perceived risk has more negative influence on older adults' intentions of online shopping compared to younger adults.

Moreover, drawing upon the model of Senior Technology Acceptance & Adoption STAM by Silverstone and Haddon (1996), a study of South Africa aimed to investigate the older adults' (60+) adoption of mobile phones (Van Biljon et al. 2010). STAM proposes that any adoption process goes through three stages; objectification, incorporation and conversion/non-conversion. It suggests that in the objectification phase, perceived usefulness and social influence determine use intention. Then begins the incorporation phase where the actual use is determined by facilitating conditions, confirmed usefulness and perceived ease of use. In the last phase a final decision is made either to accept or reject the technology based on the actual use experience gained from phase two. The model of STAM has been validated by the findings of this study and all aforementioned determinant factors on use intention and actual use were supported. What is also worth noting is the fact that approximately 68% of the participants did not get to choose their own mobile phones. Older people usually tend to ask their younger relatives or the salespersons to choose the mobile phone for them whom in many cases do not take into consideration the needs and expectations of the elderly. This issue of not meeting the needs and expectations of elderly has also been identified in the technology itself (mobile phones) as it was found that even the mobile phones, which are specially designed for older users do not meet a lot of their needs and expectations.

Aiming to assess older adults readiness to use health-related ICT, Heart & Kalderon (2013) carried out a study investigating older adults adoption of ICT, particularly computers. The researchers applied the theory of planned behaviour TPB, and used it to collect survey responses from 123 older employees, half from Israel and the other half from the US. Model testing has only partially validated TPB where only the factor of perceived behavioural control (PBC) appeared in both samples as a valid predictor of intention to use a computer. However, in the US sample, age moderated the influence of the factor of attitude (ATT) toward the behaviour whilst it moderated subjective norm (SN) in the Israeli sample, which might be an indication of the association between TPB and culture. Further, although there has been an escalation to some extent in the elderly adoption of technology, including ICT, many barriers to successful adoption identified in literature are still valid, including health issues, age and support. Therefore, with regards to the main purpose of the study, outcomes revealed that the elderly are not yet likely to easily accept and use a health-related ICT.

2.2.3 E-government Adoption

In terms of the aim of this research, a critical question to be asked in academic research is whether e-government is diffusing its services to stakeholders and whether the services have been adopted or not (Al-Sobhi, 2011). E-government is considered to be an effective tool for the public sector with its healthcare services delivery to citizens, services costs reduction and risk minimisation (Akesson et al, 2008). Further, in that context of ICT, research has found that if citizens are excluded from gaining the benefits of ICTs, they lose the opportunities that ICTs can offer to societies (Selwyn, 2004). Prior studies indicate that

the use of ICTs in government has flow-on effects on other sectors, which in turn improves productivity and reduces poverty (Walsham & Sahay, 2006).

In terms of e-government services adoption, research has largely shed light upon the factors of impact on individuals' adoption and use of e-government services. These factors include perceived online risk (Chakraborty et al. 2016), social influence and relative advantage (Rana & Dwivedi, 2015), trust in the Internet, propensity to trust, and security (Kim et al. 2008), confidence in government (Porumbescu, 2016), compatibility (Choudrie et al. 2013), cultural dimensions and privacy concerns (Meijer, 2015). Further, since the Internet is the main vehicle by which e-government services are delivered, the gap between those who do have and access the Internet and those who do not is identified as one of the key deterrent to e-government service acceptance and use (Van Deursen & Van Dijk, 2011; Brown & Thompson, 2011; Meijer, 2015). In order to position this study into its appropriate context, following is a review of existing literature pertaining to e-government services adoption in developing countries, followed by a review of existing literature on Saudi Arabia.

2.2.3.1 E-government Adoption in Developing World & Gulf Countries

E-government is an important area for developing countries where successful e-government projects can lead to increased compliance with international codes, norms, and standards, which means higher levels of accountability and reduced corruption (Gregor et al, 2014). Successful e-government can also play critical positive roles in important areas such as, health and security. However, 35% of the e-government initiatives in developing countries are considered to be failures (e.g. projects were not fulfilled or had been fulfilled but immediately abandoned), and 50% were partial failures (major objectives were not accomplished or there were adverse results) (Heeks, 2003). Further, limited adoption of e-government services by citizens has also been identified as a factor of failure of e-government projects, particularly in developing nations. Therefore, technology and related ICT adoption is an important issue for developing countries' growth and productivity (Gregor et al, 2014).

A study has been recently carried out in a major Middle Eastern Country, which is Turkey, to find out how the decision to use e-government services by citizens is formed, and what factors contribute to its formation (Kurfalı et al. 2017). To reach that understanding, the authors tested a combination of the UTAUT factors as well as two trust constructs, namely trust of Internet and trust of government. Most applied factors depicted a positive influence on behavioural intention to use-government services (except for effort expectancy and trust of government), such as social influence, facilitating conditions and trust of Internet. Performance expectancy however was the most significant, indicating that citizens highly care about the usefulness of using e-government services. What is learned from this is how important it is for governments and policy makers to publicise and promote e-services and to spread awareness among citizens of their potential usefulness. This specific lack of awareness was found to be one of the major challenges of e-government services adoption based on a Jordanian study (Al-Shboul et al. 2014). Applying semi-structured interviews,

36 Jordanian government officials from diverse departments were interviewed in order to explore the state of e-government services adoption in the country. Interviewees revealed that they think the most significant aspects contributing to insufficient e-government adoption level are:

. Lack of awareness of existing e-government services
. Inadequate trust of e-government services
. Absence of a holistic policy and regulatory framework
. Lack of training provision and knowledge sharing
. Absence of well-defined e-government strategy

Further, to achieve successful acceptance and use of e-government services by citizens, governments must maintain an appropriate level of information quality. Looking at e-government services adoption from that particular angle, Alenezi et al (2017) conducted a study that explores what hampers strategic benefits of e-government initiatives in the Gulf state of Kuwait. The study applied a qualitative approach involving semi-structured one-on-one interviews with 31 employees who belong to three e-government organisations. Outcomes identified many aspects of information quality that may hinder citizens from 'complications-free' use of e-services, such as the ease of use, security, interpretability and completeness of services. These aspects of complications could also be occurring at the organisational level but eventually negatively reflect on the end users (citizens). Examples are, lack of new and innovative e-services, lack of fast response to users' needs and lack of value-added. Further, Sharma (2015) has also addressed the issue of e-service quality in Oman, another Gulf state. He developed a model by which a connection has been established between service quality measurements and demographic variables on one hand and the willingness to use e-government services on the other side. It was found that the quality dimensions of e-services, such as efficiency, reliability, responsiveness and security, significantly influence the adoption of e-government services. It was also statistically proven that some demographic variables (age & education) have a significant impact on the willingness to use e-government services in which the increase in age decreases the likelihood of e-government services use whereas the increase in education level increases the likelihood of e-government services use.

Further, a quantitative study conducted in the context of The United Arab Emirates (UAE) to examine e-government adoption using Delone and Mclean's (2004) updated IS success model as well as the UTAUT model (AL-Athmay et al. 2016). The study examined how the intentions to use e-government services by citizens in UAE are influenced by four main factors, namely social influence, system quality, information quality, and perceived effectiveness. Findings showed that these factors considerably influence citizens' intentions to use e-government services. It was also found that the same factors influence user satisfaction, which in turn affects the intentions to adopt e-government.

Further, the implementation of e-government in developing nations has usually been viewed to be less prosperous and objectively difficult to accomplish. This is typically

because of the lack of citizen-centric approach. In that context, drawing upon the technology acceptance model (TAM), a study of Pakistan integrated the external factors of trust and social influence within the model of TAM in order to examine their indirect influence on e-government adoption by determining their direct influence on perceived ease of use and perceived usefulness (Asmi et al. 2017). Social influence was found to hold a significant positive impact on both, perceived ease of use and perceived usefulness, which in turn significantly influence the intention to use e-government. As for trust, it has proved its influence only on the perceived usefulness while it showed insignificant statistical influence of perceived ease of use. In light of these findings, a more citizen-centric approach in the stages of design and deployment of e-services is needed. Increased interactivity with the users of e-government systems will increase their trust in the institution and consequently enhance their awareness of the usefulness of the system. Further, governments in the developing world should address diverse cultural and social factors within their societies in order to increase the intentions to use e-government services.

2.2.3.2 E-government Adoption in Saudi Arabia

In 2006, the Saudi government represented by the ministry of communications and information technology launched the first National e-government Strategy & action plan. Throughout the planning process, the e-government program planners studied 20 worldwide countries in which an extensive benchmarking effort was carried out. The studied countries comprised of superior e-government countries, regional and neighbouring countries, and lastly countries that are characterised with similarities to that of Saudi Arabia (E-Government Program, 2006). Furthermore, like any project, the e-government program of Saudi Arabia has a vision statement, which stated "By the end of 2010, everyone in the Kingdom will be able to enjoy – from anywhere and at any time – world-class government services offered in a seamless, user-friendly and secure way by utilizing a variety of electronic means" (E-Government Program, 2006. P.7). Further, in addition to this vision, the e-government program of Saudi Arabia has specified a certain objectives to be achieved by the implementation of the program. These objectives fell into three main categories: offering improved e-services (e.g. user-friendly, 24/7 access and uppermost security standards), raising internal efficiency and effectiveness (e.g. paperless intra-governmental interaction and governmental e-procurement), and lastly partaking in the country's prosperity (e.g. foundation of the information society and enhance society's productivity).

Literature pertaining to e-government adoption and use in Saudi Arabia is relatively minimal. After an extensive review of related literature, and to the best of the researcher's knowledge, there has not been a single study that applied the theme of 'older adults' in an e-government adoption study in Saudi Arabia, or even in the Arab world as a whole. However, in order to position this research into its most suitable context, following is a review of general e-government adoption literature in Saudi Arabia.

Hamner & Al-Qahtani (2009) had conducted one of the early studies in terms of citizens'

willingness to adopt e-government services in Saudi Arabia. The study was conducted in the capital city of Riyadh and focused on examining correlations between certain demographic variables and willingness to use e-government services. Results indicated that age has a strong inverse relationship with citizens' desire to use e-government services in which youth are more likely to use e-government services. Further, although education levels of individuals influenced e-government adoption, it was less important than the factor of age. Finally, factors such as, knowledge of the Internet and security were significant as they impacted the individual users' perception of e-government. Further, some of these findings such as the factor of age, education level and security were again confirmed by another study examining the adoption of e-government services in Saudi Arabia (Alateyah et al. 2013). Additionally, examining various factors from TAM, DOI and quality of services model, the study highlighted other factors of impact including, e- service availability, compatibility and complexity.

Alshehri & Drew (2010) conducted a quantitative e-government adoption study in Saudi Arabia that surveyed 460 citizens from various profession backgrounds. Results indicated that apart from factors related directly to the users themselves, such as computer illiteracy, most of the barriers towards successful adoption of e-government fell into the category of 'systemic barriers'. Systemic barriers refers to problems that are out of the control of the user, including unreliable Internet connection, limited IT infrastructure in government sector, lack of skilled IT and e-systems workforce, lack of awareness about the e-government services, lack of perceived website assistance and finally the lack of perceived information privacy. The issues of privacy and security have come up again in a later study of Saudi Arabia as undermining factors of e-government adoption (Al-Tourki et al. 2012). It also seems that the lack of trained and qualified personnel as well as the humbleness of some aspects within the ICT infrastructure are two major impediments of e-government adoption in Saudi Arabia (ibid).

A study took place in Saudi Arabia that was based on two main theoretical models; the models of the theory of reasoned action (TRA) and trust model. The study aimed to find out existing barriers towards successful e-government adoption with a major focus on social and trust influences. Findings showed that citizens' trust in e-government is considerably influenced by government integrity, benevolence and capability. Trust in Internet and disposition to trust were also factors of impact on citizens' trust in e-government. Finally, social influence and trust in e-government also proven to be important predictors of citizens' behavioural intentions to adopt e-government services (Albesher, 2015).

Focusing on the commonly ignored aspect of e-government services implementation quality, more so in developing countries, it is argued that the quality of services in government websites is a key element for the adoption (acceptance) of such services within citizens (Alanezi et al. 2012). Research has explored many quality aspects of offered online services, such as the degree of information comprehension, ease of navigation, transparency, system availability, personalisation, processing time, interactivity, credibility, security, and privacy. After having carried out interviews with professional representatives

who access various e-government services on a regular basis, it was found that e-government websites in Saudi Arabia need careful consideration with regards to service quality, which if addressed in terms of meeting citizens individual needs would lead to increased citizens adoption rate.

2.2.4 Literature Review Summary

Ever since advanced technology has been introduced, the topic of accepting and using these technologies has been widely investigated. Researchers have thoroughly identified many factors influencing peoples' decision of whether to adopt a certain technology or not. Such factors act as either obstacles or catalysts with regards to achieving successful adoption of technology. For example, in the context of the developed world, technology adoption is influenced by attitudinal beliefs, fit to personal use, and utility for children hedonic outcomes (e.g. perceived entertainment), utility outcomes (e.g. work-related uses), relative advantages and behavioural control factors (e.g. cost & lack of skills) (Brown et al. 2006; Choudrie & Dwivedi, 2006). As for the context of the developing countries, technology adoption is fond to be influenced by social influence, perceived relative advantage, perceived self-efficacy, facilitating conditions, ease of use, service quality, hedonic outcomes, perceived usefulness, perceived service quality, age, performance expectancy, effort expectancy (Dwivedi & Weerakkody, 2007; Ooi et al. 2011; Manzoor, 2014; Aldhaban et al. 2016).

Further, although technology advancements have made the impossible comes true, not all people accepting and using technology. There are some groups within societies are left behind in complete technological isolation, including the group of older adults (Neves & Amaro; Niehaves & Plattfaut, 2014). Older adults are important individuals who are wealth and experience holders and need to be socially included in order to achieve "successful aging" (Becker, 2005; Czaja & Schulz, 2006). Further, literature has identified many factors on influence on older adults' adoption of technology, including independent living difficulties (e.g. health decline), personal perception about technology, social influence, and the physical environment (Peek et al. 2016), perceived online risk (Chakraborty et al. 2016), perceived usefulness, facilitating conditions, perceived ease of use (Van Biljon et al. 2010) attitudinal beliefs and subjective norms (Heart & Kalderon, 2013).

As for e-government adoption (G2C), literature has also identified various dimensions of influence on e-government adoption. Factors recognised within the developed world literature include, perceived online risk (Chakraborty et al. 2016), social influence and relative advantage (Rana & Dwivedi, 2015), trust in the Internet, propensity to trust, and security (Kim et al. 2008), confidence in government (Porumbescu, 2016), compatibility (Choudrie et al. 2013), cultural dimensions and privacy concerns (Meijer, 2015) and digital divides (Van Deursen & Van Dijk, 2011; Brown & Thompson, 2011; Meijer, 2015). As for the context of developing countries, factors include security and privacy (Alanezi et al. 2012; El-Sofany et al. 2012; Alenezi et al. 2017), complexity (Alanezi et al. 2012; Alateyah et al. 2013; Asmi et al. 2017), social influence and trust of Internet (Albesher, 2015;

Kurfalı et al. 2017), service quality (Sharma, 2015).

When considering the conceptual models and theories that have been applied in the various technology adoption studies, including e-government, it seems that researchers are noticeably using certain models and theories repeatedly. These widely used models and theories are the theory of reasoned action by Fishbein & Ajzen (1975), diffusion of innovation theory by Rogers (1983), the social cognitive theory by Bandura (1986), the technology acceptance model by Davis (1989), the theory of planned behavior by Ajzen (1991), IS success models by DeLone & McLean (1992, 2003), Model of Adoption in the Household (MATH) by Venkatesh & Brown (2001), Trustworthiness by McKnight et al. (2002), and the unified theory of acceptance and use of technology (UTAUT) by Venkatesh, Morris, Davis & Davis (2003). The next section discusses the main theories and models within technology adoption literature, followed by clear identifications and justifications for the selection of the model of this research.

2.3 Theoretical Background

The literature of IS has reached its maturity. An implication of such maturity clearly appears in the existence of many well-established and well-recognised theories and theoretical models by which examination of technology adoption influential factors is feasible. This section begins with providing an overall picture of widely used theories and theoretical models that pertain to technology adoption; followed by more comprehensive look at the theories and theoretical models upon which the conceptual model of the current research was formed. For readers' information, the conceptual model of this research was constructed by integrating and synthesising many factors that were drawn from several theoretical sources, which believed to serve the purpose of the research. The following table 2.5 identifies some of leading IS and technology adoption theories and models.

Table 2.5. Leading IS and Technology Adoption Theories and Theoretical Models

Theory / Model	Developed by	Description
Theory of Reasoned Action (TRA)	Fishbein & Ajzen, 1975	TRA originated from social psychology and suggests three main factors leading to behaviour: behavioural intention, attitude, and subjective norm (Fishbein & Ajzen, 1975).
Diffusion of Innovation Theory (DOI).	Rogers, 1983	Intended to examine user acceptance of new technologies and ideas (innovations) in which these technologies and ideas are considered to be new. According to DOI, diffusion is dependent on four main elements: the innovation, communication channels, time and social system (Rogers, 1983).
Theory of Planned Behavioural (TPB)	Ajzen, 1985	In another human behaviour theory, Ajzen (1985) extended the theory of reasoned action by adding the factor of perceived behavioural control to already existing factors of attitudes and subjective norms.
The Social Cognitive Theory (SCT)	Bandura, 1986	"According to SCT, user's behaviour is influenced by expectations of outcome related to personal as well as performance-related gains. Self-efficacy, in turn, influences the expectation of outcome of both types" (Sharma & Mishra, 2015, p.20).
Technology Adoption Model (TAM)	Fred D Davis, 1989	The model is kept simple in which behavioural intention to use a system depends on only two constructs: "perceived usefulness" and "perceived ease of use" (Davis, 1989).
The Model of PC Utilization (MPCU)	Thompson et al. 1991	MPCU offers a theoretical framework that explores one's behaviour towards the use of PC with a particular emphasis on the organizational perspective (Thompson et al. 1991).
IS Success Model	Delone & McLean, 1992	A comprehensive model by which successful adoption of IS is evaluated by examining the relations among: information quality, system quality, service quality, usage intentions, user satisfaction and net system benefits (Delone & McLean, 1992).
Model of Adoption in the Household (MATH)	Venkatesh & Brown, 2001	MATH is a model that was developed to examine PC adoption by individuals within the context of households by combining attitudinal, control and behavioral factors (Venkatesh & Brown, 2001).
Trust Model	McKnight et al. 2002	Trust model applies the Theory of Reasoned Action (TRA) as a guiding framework in which the factors leading to the establishment of trusting intentions are someone's disposition to trust, institution-based trust (trust in Internet) and the perceived trusting beliefs (McKnight et al. 2002).
Unified Theory of Acceptance and Use of Technology (UTAUT)	Venkatesh et al. 2003	UTAUT is designed to examine behavioural intention and actual use of technology. It has consolidated some of the constructs of leading adoption theories and models in order to provide a holistic model that covers a wide range of applications (Venkatesh et al. 2003).

Having identified some of the leading IS and technology adoption theories and theoretical models, the following section explains in details the theories and models upon which the conceptual model of the current study is based.

2.3.1 Theory of Reasoned Action (TRA)

Theory of Reasoned Action (TRA) was first coined by Fishbein & Ajzen (1975) in an attempt to understand how behaviour is shaped. TRA therefore has it origins in social psychology setting (Conner & Armitage, 1998). TRA proposes that the most significant element that leads to voluntary behaviour is the individual's intention to conduct that behaviour (Conner & Armitage, 1998). TRA suggests three main factors leading to behaviour, namely "behavioural intention, attitude, and subjective norm" (Fishbein & Ajzen, 1975). Figure 2.6 below shows how one's behavioural intention is shaped by his/her attitude and subjective norms. Therefore, attitude and subjective norms only affect actual behaviour indirectly through influencing intentional behaviour. Behavioural intention is the only factor that possesses a total control over actual behaviour. To further explain the meanings of the constructs of TRA, definitions are provided. Attitudes are defined as the "sum of beliefs about a particular behaviour weighted by evaluations of these beliefs" (Fishbein & Ajzen, 1975). Subjective norm is "influence of people in one's social norms environment on his behavioural intentions; the beliefs of people, weighted by the importance one attributes to each of their opinions that will influence one's behavioural intention" (Fishbein & Ajzen, 1975). Lastly, behavioural intentions are "function of both attitudes toward a intention behaviour and subjective norms toward that behaviour which has been found to predict actual behaviour" (Fishbein & Ajzen, 1975).

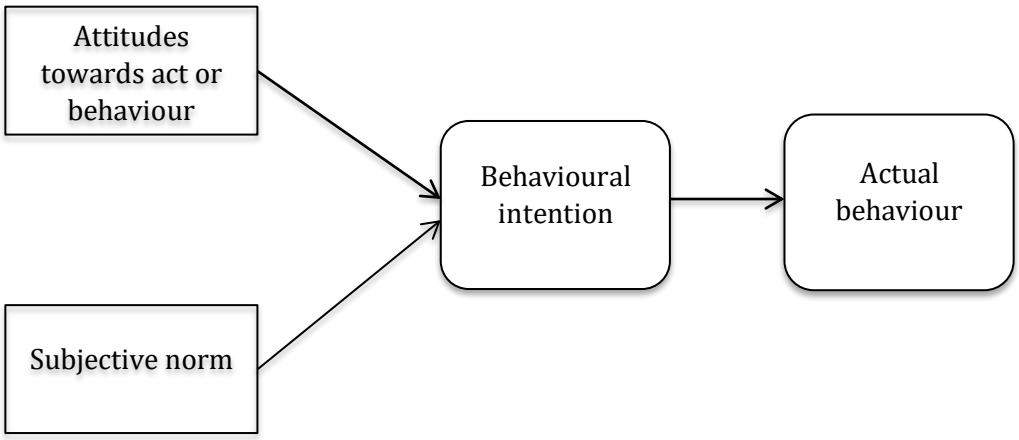


Figure 2.6. Theory of Reasoned Action, (Fishbein & Ajzen, 1975)

TRA was the first theory to be presented because in terms of this study, TRA is used as a guiding framework in which all of the applied constructs, which are drawn from different

models and theories of technology adoption and behaviour change, are examined against behavioural intentions to use e-government services.

2.3.2 Diffusion of Innovation Theory (DOI)

This study draws upon Rogers' (1983) Theory of Diffusion of Innovation (DOI). Ever since its introduction, DOI have been widely applied in adoption research (Sharma & Mishra, 2015). This theory is intended to justify and explore user acceptance of new technologies and ideas (innovations) in which these technologies and ideas are considered to be new. According to DOI, the diffusion of a new idea is dependent on four main elements, which are the innovation, communication channels, time and social system. An *innovation* is the new idea, object or technology; *communication channels* are the means whereby individuals could communicate regarding the new introduced ideas and *a social system* is the broader picture of the interconnected components of a society (e.g. individuals) (Rogers, 1995).

Further, diffusion in this context is defined as "the process by which an innovation is communicated through certain channels over time among the members of a social society" (Rogers, 1995). This process of diffusion is comprised of five phases: knowledge, persuasion, decision, implementation, and confirmation. Overall, the process of diffusion generates six groups of adopters of the new idea based on the period of adoption, namely, innovators, early adopters, early majority, late majority, laggards and the leapfroggers. Figure 2.7 below graphically depicts the idea behind DOI.

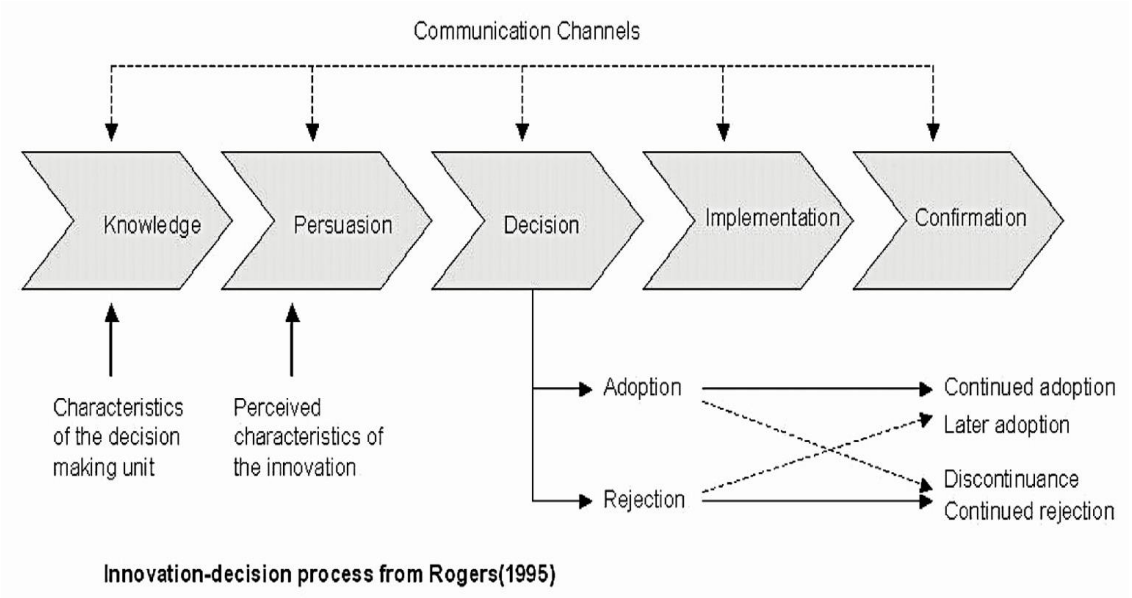


Figure 2.7. The Diffusion of Innovation Theory (Rogers, 1983)

Further, DOI suggests that an innovation is influenced by five major constructs, which are relative advantage, complexity, compatibility, trialability and observability.

Relative advantage is defined as "the degree to which an innovation is perceived as better then the idea is supersedes" (Rogers, 2003. p15). *Complexity* is "Is the degree to which an innovation is difficult to understand and use" (Rogers, 2003. p16). *Compatibility* is " the degree to which an innovation is perceived to be with the existing values, past experiences, and needs of potential adopters" (Rogers, 2003. p15). *Trialability* is " the degree to which an innovation will be experimented with on a limited basis" (Rogers, 2003. p16). Lastly, *observability* is defined as " the degree to which the results of an innovation are visible to others" (Rogers, 2003. p16). Further, as far as this study is concerned, the chosen constructs from DOI will be identified and discussed in the following section within this chapter.

2.3.3 The Model of Perceived Characteristics of Innovating (PCI)

In their work, Moore & Benbasat (1991) extended the constructs of DOI by identifying two more constructs, which are believed to have a significant impact on one's decision to adopt an innovation. This model extension is called the perceived characteristics of innovating (PCI). The first construct is image, which is defined as "the degree to which use of an innovation is perceived to enhance one's image or status in one's social system" (Moore & Benbasat, 1991, p.195). Researchers sometimes regard the construct of image as a part of the construct of relative advantage; nonetheless, even Rogers himself stated that "undoubtedly one of the most important motivations for almost any individual to adopt an innovation is the desire to gain social status" (Rogers, 1983, p.215). Further, in adoption literature, many researchers believe that the factor of social approval (image) should be distinguished from the factor of relative advantage (Holloway, 1977; Tornatzky & Klein, 1982). Therefore, in terms of the study in hand, image will be included as an independent and separate construct from relative advantage in order to determine whether or not social approval and the perception of social status influence the decision of older adults to accept and use e-government services. The second construct within PCI is voluntariness of use, which is defined as "the degree to which use of the innovation is perceived as being voluntary, or of free will" (Moore & Benbasat, 1991, p.195). Voluntariness of use is not included in the study because it is not likely for the users (citizens) to be enforced to adapt and use e-government services.

2.3.4 Trustworthiness

In literature, trust has been extensively investigated and has repeatedly been given various forms and definitions depending on the researchers' disciplines and backgrounds. For example, in social psychology, trust is defined as the perception and beliefs concerning the trustee (Rempel et al. 1985), while in sociology trust is widely defined as an attribute of the institutional settings (McKnight et al. 2002). In this study however, the definition given by Rotter (1971) is considered of most suitability to the purpose of the study in which trust is one's confidence that the promise of others whether made by individuals or groups are reliable.

The importance of trust in the online environment is widely recognised because once trust is established, it becomes a possibility for individuals to surrender the perceptions of doubt and risk and participate in "trust-related behaviours" accordingly, such as revealing personal information (McKnight et al. 2002). Further, in the domain of e-commerce, which is very similar to e-government due to the online environmental resemblance (Carter & Bélanger, 2005), emerges a salient type of trust that is an individual's initial trust in an online merchant (McKnight et al. 2002). Bigley and Pierce (1998), defined initial trust as "the trust in an unfamiliar trustee, a relationship in which the actors do not yet have credible, meaningful information about, or affective bonds with, each other" (as cited in McKnight et al. 2002, p 335). Further, in their trust-focused work, McKnight et al. (2002) proposed a trust model that applies the Theory of Reasoned Action (TRA) as a guiding framework in which the factors leading to the establishment of trusting intentions are someone's disposition to trust, institution-based trust (trust in Internet) and the perceived trusting beliefs. The relations between those factors and how this eventually might lead to actual trust behaviours are presented in figure 2.8 below.

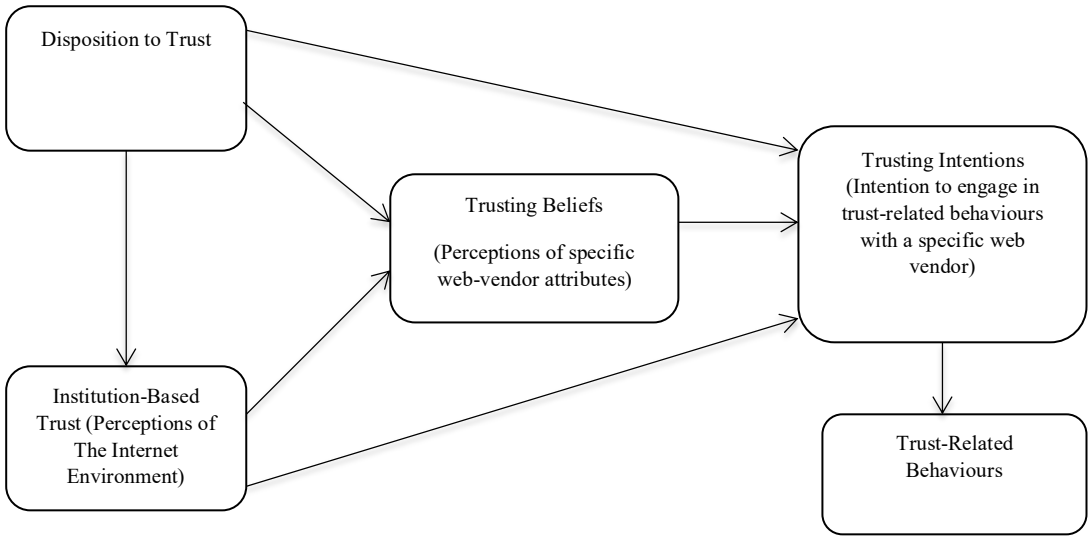


Figure 2.8. Web Trust Model Overview (McKnight et al. 2002)

Further, when considering trust within the context of e-government services adoption, during first engagements, trust is mainly shaped by three elements: the trustor attributes in terms of his/her disposition to trust, perception and beliefs concerning the trustee which in this case reflects his/her trust of the government, and lastly the assumptions formed regarding attributes of the institutional settings which in this case reflects his/her trust of the Internet (Grazioli & Jarvenpaa, 2000). To further explain the above-mentioned factors of trust, definitions are given. *Disposition to trust* refers to "the extent to which one displays a consistent tendency to be willing to depend on general others across a broad spectrum of situations and persons" (McKnight & Chervany, 2001, p.38). This initial form

of trust deals with someone's overall propensity to have faith in others or not; hence, some researchers refers to it as the personality-based trust (Gefen et al., 2003). Further, as for *trust of the government*, it refers to "one's perceptions regarding the integrity and ability of the agency providing the service" (Bélanger & Carter, 2008, p167). Gefen et al. (2005) argue that achieving successful adoption by potential users of a given technology is highly dependent on their trust in the agency providing services through that technology. In light of this, for e-government initiatives to thrive and succeed, potential users of such projects must establish faith in the agency providing the online services that it is capable of doing so (Bélanger & Carter, 2008). Finally, the *institution-based trust* refers to "the belief that needed structural conditions are present (e.g., in the Internet) to enhance the probability of achieving a successful outcome in an endeavour like e-commerce" (McKnight et al. 2002, p339). Institution-based trust is an essential predictor of e-service acceptance and use and is drawn from sociology in which it pertains to situations where in some environments, such as the online one, there is a lack of general shared community values (Zucker, 1986; Bélanger & Carter, 2008). More descriptions of those factors in the context of e-government will be provided in the next section within this chapter.

2.3.5 Learning Theories of Attitude Change

In the literature of information systems, attitude has been greatly applied (Chen & Sharma, 2015). Researchers have widely examined the relation between one's attitude toward objects to actions, in which attitude reveals to which degree an individual likes or dislikes an object, whereas an object reflects any dimension of the individual's world (Friedkin, 2010). While literature recognises the pertinent role of an end- user's attitude, it lacks information on attitude formation. Therefore, learning theories of attitude change attempt to clarify the mechanisms by which individuals' attitudes are being shaped (Lorge, 1936; Hovland et al, 1953). Many behavioural and pioneering researches, such as Fishbein & Ajzen (1975) theory of reasoned action (TRA) and Ajzen (1991) theory of planned behaviour (TBP) have adopted these learning theories as the principal theoretical roots for their work. Based on learning theories, learning processes result in individuals' attitudes in which these processes are highly dependent on the three principles of observation, reinforcement, and association (Taylor, 1998). In particular, learning theories takes into consideration three major aspects of attitude formation, which are social learning, classical conditioning, and operant conditioning (Feist & Rosenberg, 2010).

The aspect of *social learning* is related to attitude formation based on the opinions of a "reference group" (Weiten, 1996). Further, any social system is characterised by certain values, culture and norms by which the social members form their beliefs Benedict (1934). It is an indication that the social context is a key element in terms of the social learning of the members within a certain society, and that social settings influence how attitude is "learned" (Bem, 1967; Ormrod, 1999). Applying the aspect of social learning to the context of this study, it is suggested that a reference group has an important role in forming individuals' willing or unwilling to adopt e-government services. The influence of social learning takes place when potential users of e-government websites consult people who are

important to them and their opinions are appreciated. The influence of a reference group is critical in the persuasion process (Bella, 2006).

As for the *classical conditioning* aspect, it is also a learning process that pertains to someone's natural spontaneous behaviours, which are usually triggered by external spurs (Chen & Sharma, 2015). In psychology, individuals express different emotional reactions to the objects and events they encounter within their own environmental contexts based on their own evaluations and personality traits (Insko, 1967). The main personality trait that classical conditioning relates to is someone's extroversion. Individuals who are high in extroversion usually "enjoy the company of others and the stimulation of social interaction. They like parties and may be group leaders. They have a fairly high level of energy and tend to be cheerful and optimistic. Those who know such people would describe them as active and sociable" (Costa & McCrae, 1992, p.243). Therefore, in terms of this study being an e-government-focused one, classical conditioning was not included to the model because it relates more to one's extroversion, which reflects his/her sociability and friendliness, and does not serve the purpose of the study.

Finally, the last aspect of attitude formation identified within learning theories is *operant conditioning*. Operant conditioning is widely referred to as instrumental conditioning, and was first coined by Skinner (1938). Skinner in his work contributed to the understanding endeavour of complex human behaviour in which he believed that classical conditioning is too basic to offer a comprehensive explanation of such complicated phenomenon. He proposes that examining the triggers of behaviour and its consequences is the best approach to understand the mechanisms of that behaviour. Operant conditioning is based on a law he called Effect – Reinforcement Law in which "behaviour which is reinforced tends to be repeated (i.e., strengthened); behaviour which is not reinforced tends to die out or be extinguished (i.e., weakened)" (McLeod, 2015). As a result, operant conditioning may influence one's attitude towards an idea or object by the perceived rewards and/or the perceived risks (Chen & Sharma, 2015). In light of this and within the context of this study, to examine operant conditioning, the two dimensions are included (perceived rewards and perceived risks) in the form of the perceived e-government website assistance and the perceived cyber (environment) risk (ibid).

2.4 Development of Conceptual Framework

A conceptual framework is intended to "explain, either graphically or in narrative form (diagrams are much preferred), the main things to be studied - the key factors, constructs or variables - and the presumed relationships among them" (Miles & Huberman, 1994, p.18). It is therefore used as a tool whereby researchers can make sense of the subsequent outcomes of their studies. A conceptual framework makes it feasible for initially identified research questions and objectives to correspond to literature. It also acts as a reference that harmonises the major parts of a research, such as literature review, methodology and data analysis (Smyth, 2004). For quantitative studies, like the current study, a conceptual framework is imperative in which it is normally presented diagrammatically, portraying

constructs, their theoretical position in relation to each other and the proposed associations between them (Punch, 2005). In terms of this research, this section identifies the constructs used for the development of the conceptual framework. These constructs were derived from renowned and leading IS, technology adoption, social science and learning theories. This is followed by a diagrammatical representation of the conceptual framework developed for the study (figure 2.13).

2.4.1 Theoretical Foundation

After an extensive review of related theories in e-government studies, it was found that the majority of studies pertaining to ICTs adoption within the venue of e-government have few results in terms of the following two areas:

- Older adults: Although a large number of studies on technology adoption exist and are occurring, there are minimal studies emphasising older adults and e-government adoption; particularly within the context of developing countries.
- Trust and Adoption: Technology adoption studies have extensively applied theoretical models and constructs that investigate the impact of attitudinal, normative and control beliefs factors on individuals' willingness to use e-government services. However, few studies attempt to combine adoption factors with well-established trust constructs. By including trust, a better and more comprehensive understanding of individuals' adoption of e-government can be reached. Such comprehensive models are also sought when considering factors such as, age, or gender within older adults given the lack of older adults' e-government adoption studies. Having identified the existence of a research gap within IS literature, this research considered the intentions of an older adult population in a developing country in terms of their using and adopting an e-government platform, the MOI e-portal. This would be possible by forming a conceptual model that is based on a combination of the following conceptual categories:

1- Attitudinal Beliefs

This refers to one's feeling either a negative or a positive feeling towards something or an object (Eagly & Chaiken, 1993). Technology adoption research has long attempted to understand how attitudinal aspects towards a new technology are formed. In order to reach such an understanding, over the years, researchers have used learning theories of attitude change, which are capable of revealing the attitudes formation mechanisms. Classic theories, such as the Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TBP) have also used learning theories of attitude change as the foundation for their models (Chen & Sharma, 2015). The constructs of learning theories applied to this study's model are social learning (equivalent to primary influence) and operant conditioning (perceived cyber risks & perceived website assistance). Classical conditioning pertains to the sociability and friendliness of individuals, which is irrelevant to the aim of this study; therefore excluded. Definitions of the chosen constructs (primary influence, perceived cyber risks & perceived website assistance) will be provided in the next section of hypotheses development. The following figure 2.9 depicts the three attitudinal constructs

and their proposed relationships with the key dependent variable (Behavioural Intention).

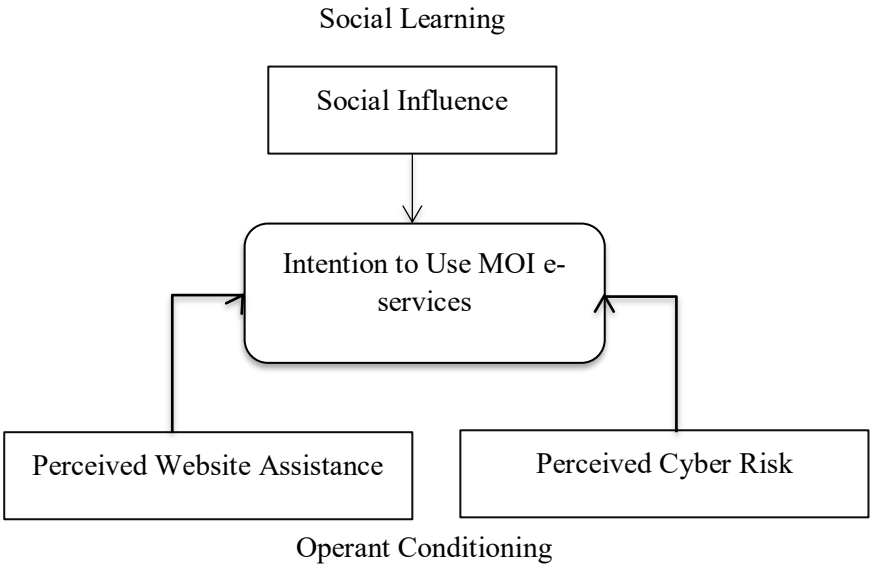


Figure 2.9. Attitudinal Formation under Learning Theories

2- Innovation Attributes

Innovation attributes are drawn from Rogers (1983) Diffusion of Innovations Theory (DOI) whereby an innovation refers to a new technology or idea. The main purpose of DOI is to understand the rate at which an innovation is diffused among a given population where diffusion is defined as "the process by which an innovation is communicated through certain channels over time among the members of a social society" (Rogers, 1995). DOI consists of five key constructs by which adoption of a new innovation is effected; namely relative advantage, complexity, compatibility, trialability and observability. Observability and trialability are not as relevant as the other constructs to adoption literature, and the latter does not offer explanatory power, as it would not exhibit enough variance; therefore, both constructs will not be included in the conceptual model of the current study (Tornatzky & Klein, 1982). Applying the abovementioned constructs of DOI to the current research aims to determine the extent to which the diffusion (older adults' intentions to use the MOI e-portal) of the new innovation (in this case the MOI e-portal) is influenced by the innovation attributes. Definitions and explanations of the chosen constructs will be given in the hypotheses section. The following figure 2.10 shows the innovation constructs and the presumed relationships with behavioural intentions.

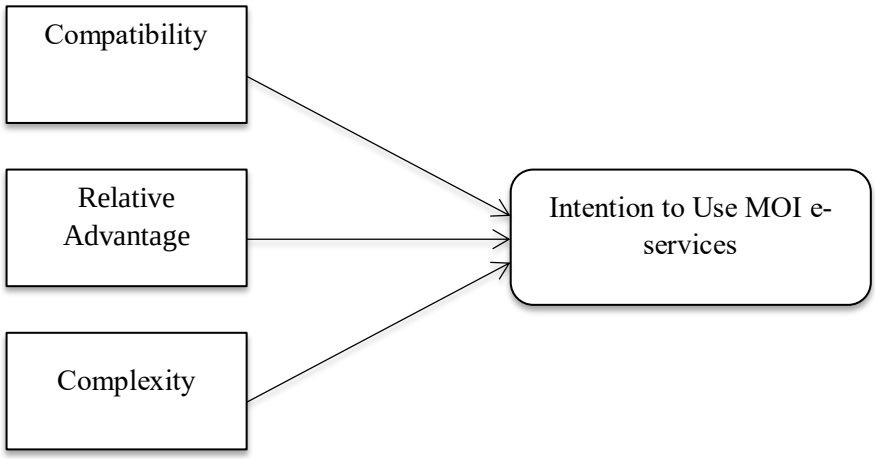


Figure 2.10. Innovative Attributes Drawn from DOI
(Rogers, 1983)

3- Subjective Norms

Building upon the previously discussed Roger's DOI theory, Moore & Benbasat (1991) developed the model of perceived characteristics of innovating (PCI). PCI presents image and voluntariness as additional constructs of influence on individuals' acceptance of a given innovation. Image, which was part of TRA as subjective norm, refers to someone's social status or image in a cultural society. Subjective norm deals with the impact on one's behaviour by the judgment of important people (e.g. friends). Image is sometimes viewed as part of relative advantage; nevertheless, in adoption literature, many researchers believe that the factor of social approval (image) should be distinguished from the factor of relative advantage (Holloway, 1977; Tornatzky & Klein, 1982). Therefore, in terms of the study in hand, image will be included as an independent and separate construct from relative advantage in order to determine whether or not social approval and the perception of social status influence the decision of older adults to accept and use e-government services. Another reason for the inclusion of 'Image' is the great extent of attention web-based technology have acquired in the popular media (Carter and Bélanger, 2005). On the other hand, the construct of 'Voluntariness' is inapplicable to this research because it is unlikely for older adults to be enforced to adopt the MOI e-portal platform. The following figure 2.11 shows the image construct and the presumed relationship with behavioural intentions.

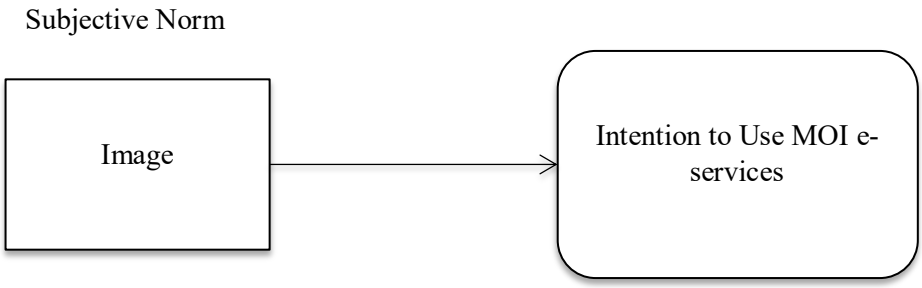


Figure 2.11. Subjective Norm & Behavioural Intentions
Adopted from (Carter & Bélanger, 2005)

4- Trustworthiness

There has always been the issue of trust when it comes to citizens and adoption of e-government services. The trust dilemma results from two main factors: doubts of online transactions security, and confidentiality issues with respects to the use of information submitted online (Bélanger & Carter, 2008). Trust is defined as "the expectation that the promise of another can be relied upon and that, in unforeseen circumstances, the other will act in the spirit of goodwill and in a benign fashion toward the trustor" (Grazioli & Jarvenpaa, 2000, p.396). Given the importance of the trust factor in the online environment, the current study applies Bélanger and Carters' (2008) trust model (based on McKnight et al. 2002), which uses TRA as a guiding framework. The constructs adopted are disposition to trust, trust of the Internet, and trust of the government. Applying these constructs will help determining the impact of different dimensions of trust perceptions on the older adults' intentions to use the MOI online platform. Definitions and explanations of the chosen constructs in this category will be given in the hypotheses section. The following figure 2.12 shows the trust construct and the presumed relationship with behavioural intentions.

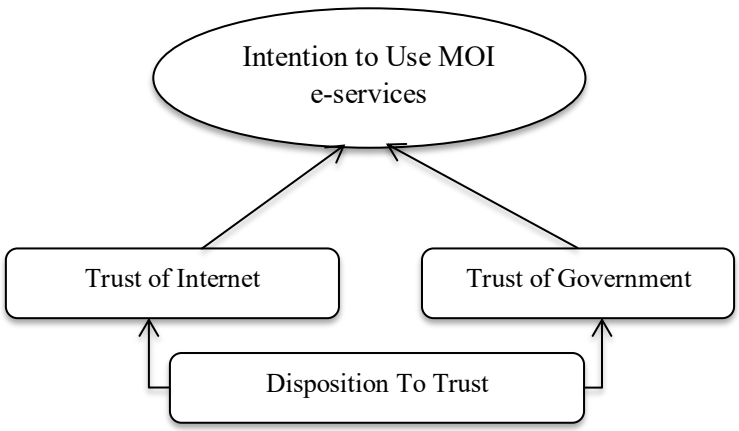


Figure 2.12. The e-government Adoption Trust Model
Adopted from (Bélanger & Carter, 2008)

2.4.2 Key Dependent Variable

Behavioural Intention (BI)

Behavioural intention is a key variable in the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975), and it is the only factor that possesses a total control over actual behaviour. Behavioural Intention (BI) is defined as "the degree to which a person has formulated conscious plans to perform or perform some specified future behaviour" (Warshaw & Davis, 1985, p.215). In IS literature, the intention to use a given system is proven to be a good predictor of actual system usage (Bélanger & Carter, 2008). Therefore, all of the applied constructs in this study will be used to measure their influence on the dependent variable of intentions to use e-government services (the MOI e-portal) except for the disposition to trust that is designed to determine the influence of someone's propensity to trust on his/her trust in Internet and in government. Following is a figure (2.13) that depicts the developed conceptual model for this study; followed by table 2.6 that contains the used constructs and their definitions.

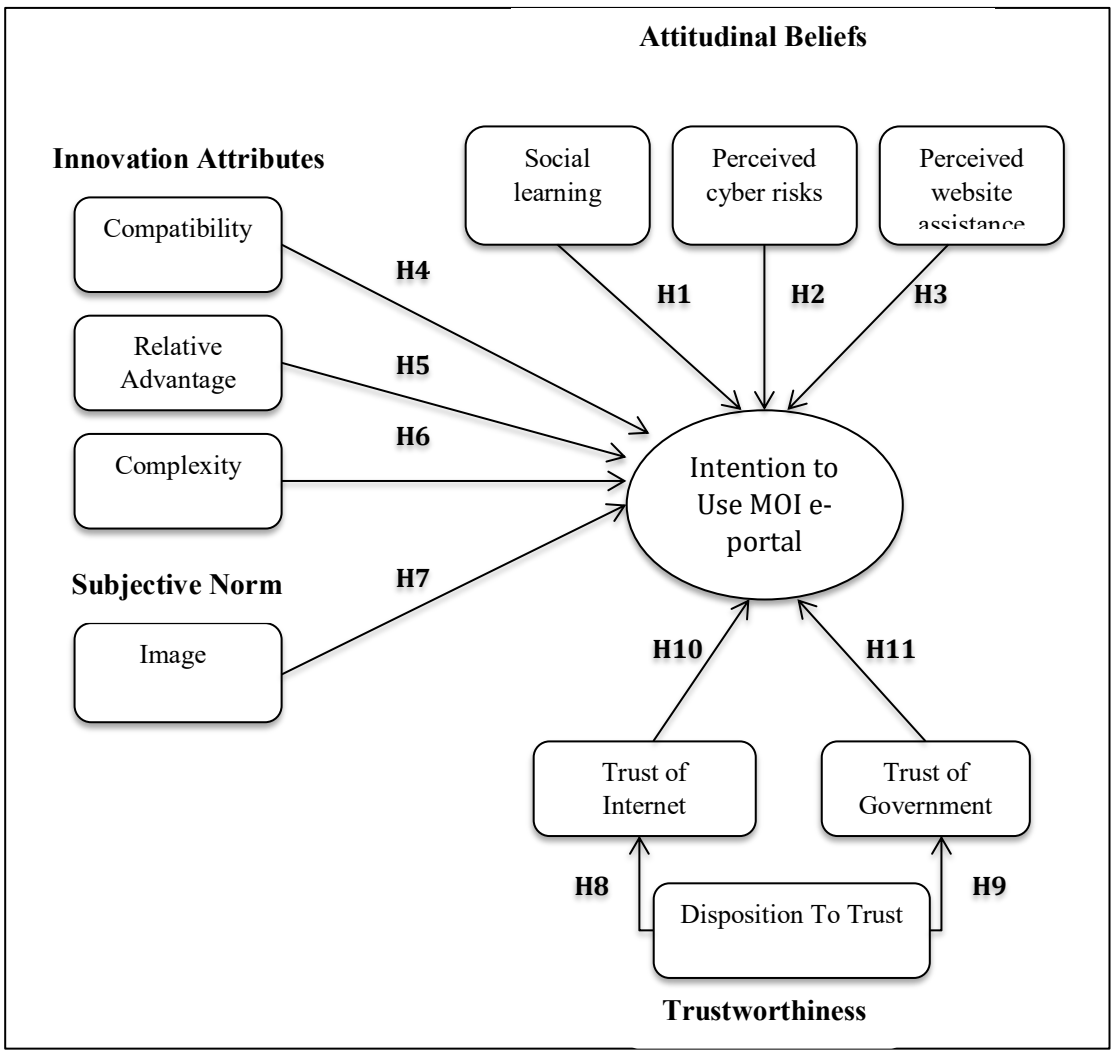


Figure 2.13. Conceptual Model of The Willingness to Use E-government Services

Table 2.6. The constructs used for the proposed e-government adoption model

Attitudinal Beliefs	
Social Influence (Primary Influence)	"The extent to which members of a social network influence one an other's behaviour" (Venkatesh & Brown, 2001, p.82).
Perceived Cyber Risks	"The citizen's subjective expectation of suffering a loss in pursuit of a desired outcome" (Bélanger & Carter, 2008, p.168).
Perceived Website Assistance	The perception that a website facilitates a user's activities and provide suitable support when needed (Chen & Sharma, 2015).
Innovation Attributes	
Compatibility	"The degree to which an innovation is perceived to be with the existing values, past experiences, and needs of potential adopters" (Rogers, 2003, p.15).
Relative Advantage	"The degree to which an innovation is seen as being superior to its predecessor" (Rogers, 2003, p.15).
Complexity	"The degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand" (Rogers, 2003, p.16).
Subjective Norms	
Image	"The degree to which use of an innovation is perceived to enhance one's image or status in one's social system" (Moore & Benbasat, 1991, p.195).
Trustworthiness	
Trust of Internet	"The belief that needed structural conditions are present (e.g., in the Internet) to enhance the probability of achieving a successful outcome in an endeavour like e-commerce" (McKnight et al. 2002, p339).
Trust of Government	"One's perceptions regarding the integrity and ability of the agency providing the service" (Bélanger & Carter, 2008, p167).
Disposition to Trust	"The extent to which one displays a consistent tendency to be willing to depend on general others across a broad spectrum of situations and persons" (McKnight & Chervany, 2001, p.38).
Key Dependent Construct	
Behavioural Intentions	"The degree to which a person has formulated conscious plans to perform or perform some specified future behaviour" (Warshaw & Davis, 1985, p.215)

2.5 Hypotheses Development

The research hypotheses will be used as a guide for identifying the presumed relationship between the set of dependent and independent constructs within the theoretical model. A hypothesis is defined as "a specific statement of predication" (Trochim & Donnelly, 2006, p.9). For this study, eleven hypotheses were proposed as follows:

(For the items used, refer to appendix 2-2).

2.5.1 Social influence (Primary Influence)

Social influence refers to "The extent to which members of a social network influence one an other's behaviour" (Venkatesh & Brown, 2001, p.82). Based on that definition, and in terms of this research, social influence refers to the impact on a person's behaviour by a reference group. This group comprises of people whose their viewpoints are considered to be of a great deal to an individual, such as family members, partners, friends and colleagues (Venkatesh & Morris, 2000a). Moreover, there is a remarkable influence on the psychological desires and necessities for an individual by a reference group, which consequently leads to an attitude change by that individual to meet the expectations of his/her reference group (Deutsch & Gerard, 1955). Further, this fact was later confirmed in the context of technology adoption and acceptance whereby individuals are significantly influenced by primary influence (Venkatesh, 2000). Therefore, in terms of this study, social influence is predicted to show a significant effect on the willingness of older adults towards using the governmental services provided online via the MOI platform. Accordingly, it is proposed that:

H1: Social influence will positively relate to older adults' intentions to use the MOI e-Portal.

2.5.2 Perceived cyber risks

In general, the notion of risk is usually associated with one's belief with regards to the probability of gains and losses (Warkentin et al., 2002). Further, given the difficulty to quantitatively gauge risk, literature tends to concentrate on the notion of one's risk perceptions. Within the online environment, risk perception is characterised by behavioural and environmental doubts. Behavioural doubts are related to the behaviour of the online service providers and the probability of treating users deceptively, exploiting the impersonal nature of the Internet, whereas environmental doubts are associated with the difficulty to foresee unpleasant events that might occur online which are out of the users' control (Pavlou, 2003).

Perceived cyber risk is associated with an individual's reluctance and hesitations to use an online system due to the likelihood of being a victim of cybercrimes, such as online fraud, identity theft and hacking (Wang et al, 2009). In terms of e-government services adoption, risk perception is defined as "the citizen's subjective expectation of suffering a loss in pursuit of a desired outcome" (Bélanger & Carter, 2008, p.168). Further, in technology

adoption literature, the factor of perceived online risk has repeatedly been reported as a deterrent to using online systems (Chakraborty et al. 2016). In addition, like any other service or product delivered online, The MOI e-portal is exposed to different types of cybercrimes; therefore, how an individual perceives possible cyber risks might have an unfavourable influence on his/her intentions towards using an online system, and in this case, The MOI e-portal. Accordingly, it is proposed that:

H2: Perceived cyber risk will negatively relate to older adults' intentions to use the MOI e-Portal.

2.5.3 Perceived Website assistance

Perceived website assistance is the perception that a website facilitates a user's activities and provide suitable support when needed (Chen & Sharma, 2015). In literature, particularly in e-commerce research, the construct of perceived website assistance is equivalent to perceived services quality and/or perceived system usability. Service quality pertains to the extent to which the users of an online system, such as websites perceive provided services as being superb and of high quality (Bolton & Drew, 1991). As for perceived system usability, it is widely considered to be a key dimension within service quality. Usability is found to be a significant aspect that organisations must achieve when they offer their services online (Flavia´n et al. 2006). The importance of usability is emphasised because attributes, including effectiveness, efficiency and user satisfaction all can be reached by achieving system usability (ibid). Therefore, in terms of e-government, it is imperative for the designers of e-governmental websits to take into consideration the needs and requirements of users, especially given the absence of the face-to-face interaction in the electronic environment (Liu & Arnett, 2000). Further, in the context of the current research, when a user recognises that the MOI e-Portal provides him or her with robust online assistance in order to help managing personal online activities and overcoming any issue that might come up, the user intentions to use the portal will most likely be positively influenced. Accordingly, it is proposed that:

H3: Perceived website assistance will positively relate to older adults' intentions toward using The MOI e-Portal.

2.5.4 Compatibility

According to Rogers (2003), compatibility refers to "the degree to which an innovation is perceived to be compatible with the existing values, past experiences, and needs of potential adopters" (p.15). Further, it has frequently been discovered in different contexts, such as, e-commerce that compatibility has indeed the most significant relationship with use intentions (Van Slyke et al. 2004). For the potential users of any IT-based system, if the provided services or/and products are incompatible with their life style, values, beliefs or experiences, it is unlikely for them to perceive the benefits of accepting and using those systems (Moore & Benbasat, 1991). Therefore, in terms of e-government services adoption, in order to escalate the likelihood of e-services acceptance and use by citizens, "agencies

should provide information and services in a manner that is consistent with other ways citizens have dealt with the government (e.g. online forms should resemble paper forms that citizens are familiar with)" (Carter & Bélanger, 2005, p.18). In the context of the current study, it is presumed that the issue of compatibility is even more critical when the users are older adults over 50 years old, given their lack of skills and interest with regards to the use of Internet and computers (Choudrie & Vyas, 2014). Therefore, a rational presumption is that when older adults citizens find the MOI e-portal to be compatible with the way they like to do things, it is most likely that their intentions to use the website will increase. Accordingly, it is proposed that:

H4: Greater levels of perceived compatibility will positively relate to older adults' intentions to use The MOI e-Portal.

2.5.5 Relative Advantage

Relative advantage is defined as "the degree to which an innovation is seen as being superior to its predecessor" (Rogers, 2003, p.15). In other words, it is the perception that an individual develops, in which he or she can conduct a task more easily by adapting the new innovation. When such positive perception of a new innovation is formed, the possibility of rapid acceptance and use significantly rises (Straub, 2009). Further, relative advantage has widely been identified as one of the leading motivations that considerably influence one's intentions to use technology (Choudrie & Dwivedi, 2006). In literature, relative advantage is sometimes used interchangeably with perceived usefulness from TAM due to similarities between the two constructs. For that reason, in the UTAUT, Venkatesh et al. (2003) combined both constructs into one construct under the label of performance expectancy (Carter & Bélanger, 2005). In terms of e-government, perceived usefulness is a very decisive factor with regards to the adoption of e-government services (Asmi et al. 2017). This is even much more related to the context of older adults where perceived usefulness acts as a motivational factor for the elderly to use the governmental services (Choudrie et al. 2013). Therefore, in terms of the current study, it is presumed that perceived relative advantage would increase the likelihood of adopting services provided on the MOI e-portal by older adults. Accordingly, it is proposed that:

H5: Greater levels of perceived relative advantage will positively relate to older adults' intentions to use The MOI e-Portal.

2.5.6 Complexity

Complexity is defined as "the degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand" (Rogers, 2003, p.16). Perceived complexity level is evident to have a major role in shaping the overall navigation experience of a website users, which consequently leads to forming the final judgment of that website. Therefore, complexity level is directly related to users' satisfaction (Geissler et al. 2001). To better understand the dimensions of the construct of complexity, Nadkarni and Gupta (2007) proposed that perceived website complexity is categorised

based on three aspects: component (visual features like videos and text), coordinative (flow of information and linking between topics) and dynamic (e.g. hyperlinks workability). In terms of e-government websites, simplicity of navigation and information allocations, and adherence to the needs and expectations of citizens are complexity aspects that influence their intentions in relation to whether adopt e-government services or not (Carter & Bélanger, 2005). Further, in the context of the current study, as the e-government services are relatively new in Saudi Arabia compared to developed countries, the issue of complexity is probably one of the most significant factors that influence the adoption of this innovation. It becomes even more influential when the users are the older adults. Accordingly, it is proposed that:

H6: Lower levels of perceived complexity (or higher ease of use) will positively relate to older adults' intentions to use The MOI e-Portal.

2.5.7 Image

According to Moore & Benbasat (1991) image refers to "the degree to which use of an innovation is perceived to enhance one's image or status in one's social system" (p.195). Some people consider using certain innovation to be an indication of having a high profile. Rogers (1983) believes that image is indisputably a very significant factor by which many people are motivated to use a certain innovation, reflecting one's prestigious status. As for older adults and e-government adoption, it was found that the prestigious image of senior citizens who are adopters of e-government services might be enhanced because of their ability to empress non-adopters peers with their technological skills, and with their ability to be included in the modern technologically-sophisticated societies (Phang et al. 2005). Further, in the literature pertaining to e-government adoption and developing countries, image has been identified as a valid predictor of citizens' e-government services adoption (Ahmad et al. 2013). Further, given the growing importance of e-government services in Saudi Arabia as well as the great deal of coverage by the press, it is very likely that adopting the services of the MOI e-portal would increase the perceived image by the users of those services. Accordingly, it is proposed that:

H7: Greater levels of perceived image will positively relate to older adults' intentions to use The MOI e-Portal.

2.5.8 Trust of the Internet (TOI)

In literature, trust of the Internet is repeatedly referred to as the institution-based trust, which is defined as "the belief that needed structural conditions are present (e.g., in the Internet) to enhance the probability of achieving a successful outcome in an endeavour like e-commerce" (McKnight et al. 2002, p339). Institution-based trust is an essential predictor of e-service acceptance and use and is drawn from sociology in which it pertains to situations where in some environments, such as the online one, there is a lack of general shared community values (Zucker, 1986; Bélanger & Carter, 2008). In light of this, it can be deducted that trust of Internet is antecedent to trust of the agency providing the services

because in order to establish trust in the service provider, one must establish trust in the channel by which those services are delivered. Similarly, with regards to e-government, it is critical for users (citizens) to establish trust in the mediator channel for carrying out online transactions with the government in terms of information and transactions security (Shapiro, 1987). Therefore, it is projected that in relation to the MOI e-portal, users, including older adults must first recognise the online environment as safe and trustworthy in order to increase their willingness to adopt the online services. Accordingly, it is proposed that:

H8: Trust of the Internet (TOI) will positively relate to older adults' intentions to use The MOI e-Portal.

2.5.9 Trust of the government (TOG)

Trust of the government (TOG) refers to "one's perceptions regarding the integrity and ability of the agency providing the service" (Bélanger & Carter, 2008, p167). In order for potential users (citizens) of the online governmental services to effectively accept and use those services, they must first belief that the service providing agency is completely capable of introducing secure, robust and trustworthy online services (Gefen et al. 2005). Governmental agencies ought to prove to the users their ability to competently carry out online transaction systems, in which all technical requirements and sufficient security measurements are being evidently met. Otherwise, users will lose trust in governmental agencies, and consequently lose the willingness to participate in any e-government projects (Bélanger & Carter, 2008). In terms of the current study, similar to previously discussed TOI, it is projected that the successful establishment of trust in government would lead to higher levels of willingness to accept and use the services provided via the MOI e-portal. Accordingly, it is proposed that:

H9: Trust of the government (TOG) will positively relate to older adults' intentions to use The MOI e-Portal.

2.5.10 Disposition to trust (DTT)

Disposition to trust can be seen as a previous psychological state to the previously discussed TOI & TOG. It can be described as whether an individual tends to have faith and trust in others or not without any immediate external influential factors. McKnight & Chervany (2001) define it as "the extent to which one displays a consistent tendency to be willing to depend on general others across a broad spectrum of situations and persons" (p.38). Trusting stance and having faith in humanity are the two comprising dimensions of disposition to trust. The first dimension relates to one's positive propensity towards others in which they are trustworthy and dependable. The latter dimension reveals one's belief of acquiring better results when dealing with others as if they are good-natured and faithful (McKnight et al., 2002). Therefore, in terms of e-government, disposition to trust, as it has been described above, is beyond the direct control of any government body. An individual disposition to trust affects his/ her trust of the Internet and trust of the government, which in

turn influence intentions to use e-government services (Bélanger & Carter, 2008). In terms of the MOI e-portal, it is presumed that users with high levels of disposition to trust necessarily tend to have more faith in the Internet and the government. Accordingly, it is proposed that:

H10: Disposition to trust will positively relate to older adults' trust of the Internet (TOI).

H11: Disposition to trust will positively relate to older adults' trust of the government (TOG).

Table 2.7. Summary of Research Hypotheses

HN	Independent Variables	Dependent Variables
H1	Social Influence	Use Intentions
H2	Perceived Cyber Risk	Use Intentions
H3	Perceived Website Assistance	Use Intentions
H4	Compatibility	Use Intentions
H5	Relative Advantage	Use Intentions
H6	Image	Use Intentions
H7	Complexity	Use Intentions
H8	Disposition To Trust	Trust of the Internet
H9	Disposition To Trust	Trust of the Government
H10	Trust of the Internet	Use Intentions
H11	Trust of the Government	Use Intentions

2.6 Demographic Variables

This section provides an overall description of the socio-demographic variables that will be identified later when analysing the collected research data. Socio-demographic variables are defined as "characteristics or attributes of subjects that are collected to describe the sample" (Burns & Susan. 2007, p.182). Literature has highlighted various variables, including age, gender, education, employment, and health as the key socio-demographic variables (Burgess, 1986). This study will cover a wide range of those variables with a

specific focus on age, gender, education and health in order to determine their impact on older adults' Internet adoption and intentions to use e-government services. The importance of such variables is that they offer significant information about the characteristics of the population under study.

In technology adoption literature, age has usually been identified as a major deterrent to technology adoption (Neves & Amaro, 2012; Czaja & Schulz, 2006; Al-Sobhi, 2011). Further, even within older adults groups themselves, research revealed that they are not identical when considering technology acceptance and use (Niehaves & Plattfaut, 2014). As for the gender variable, there has been identified some differences between males and females in the venue of technology adoption decision process. For example, it was found that attitude towards technology use is a decisive factor for males (Venkatesh 2000; Morris et al. 2005) whereas females were more effected by subjective norm and perceived behavioural control (Venkatesh, 2000). These differences amongst technology adoption research participants also exist in terms of the level of education in which the connection between the adoption and usage patterns of technology (e.g. the Internet) and participants' level of education is evident (Teo et al. 1999; Teo, 2001). Finally, in terms of this research, the health variable is perhaps as important as the age variable given that this study concerns older adults in which health is most likely to be of considerable impact. In terms of the presumed association between technology adoption and health conditions of potential users, this will be analysed and examined against the notion that as age increases, general health declines, which in turn makes the use of some technologies becomes challenging; and thus unfavorable (Eilers, 1989).

2.7 Chapter Summary

Chapter 2 started with defining the key terminologies and concepts used in the thesis, such as e-government, digital divides and older adults. Those definitions were in some instances accompanied with related statistics in order to inform readers of the overall picture and the current state of the relevant concept. This was then followed by a comprehensive literature review that covered major related topics, including technology adoption, older adults, digital divides, and lastly e-government adoption in the context the of developing world with a particular concentration on Saudi Arabia's situation. Next, this chapter provided a background of the theoretical and conceptual foundations across a wide spectrum of technology adoption and social science literature. This was followed by the section, which articulated the theoretical basis upon which the model of this research had been built. For reader's information, the constructs of the model were drawn from TRA, DOI, PCI, Trust model and Learning Theories of Attitude Change. Further, the last section within this chapter was related to hypotheses development and constructs definitions. Overall, 11 hypotheses were proposed to be used as a guide for identifying the presumed relationship between the set of dependent and independent constructs within the theoretical model. To inform readers, the next chapter 3 is dedicated to discussing methodology as well as research approach applied in this thesis; followed by chapter 4 which focuses on the development and execution of the pilot phase.

Chapter 3

Research Methodology

3.0 Introduction

This chapter is intended to provide the philosophical underpinnings of this research in terms of its ontological and epistemological stance. The chapter begins with section 3.1, which provides an introductory to research process based on the 'research onion', followed by section 3.2, which delivers an overview of existing research paradigm. Then based on the research's philosophical underpinnings, section 3.3 explains and justifies the approach of inquiry applied in the study. In section 3.4, the key differences between qualitative and quantitative research methods are provided with more concentration on the quantitative approach, being adopted by this study. Thereafter, time horizon of the research is discussed in section 3.5; followed by section 3.6 in which primary and secondary sources of data collected will be discussed in details. As for section 3.7, it concerns the selection process of the quantitative analysis methods used to test the primary collected data. Further, sections 3.8 and 3.9 pertain to the selection of the research site and the MOI e-portal respectively. Towards the end of this chapter, the process of instrument validation is discussed in section 3.10 where discussions on content validation, pilot testing, constructs' reliability and validity measurements are provided. Finally, the topics of sampling frame, sample size and sampling techniques used in this research are discussed in sections 3.11, 3.12 and 3.13.

3.1 Research Process

Before the commencement of any research, it is crucial to create a 'road map' that shows how the various elements and processes of the research are going to be selected and administered. One of leading research process plans is what is known as 'the research onion' of Saunders et al (2008) depicted in figure 3.1 below. The idea is that any research is comprised of various processes referred to as layers of the 'onion' in which the last and central point is the actual collection and analysis of data (Saunders et al. 2009), To reach that final point, the research team should first decide on the previous ones in a process that resembles peeling an onion layer by layer. In terms of this research, the research onion was consulted and referred to throughout the course of the research process construction (ibid). The following section explains how the first layer of the onion, which is the philosophy surrounding this research, was determined.

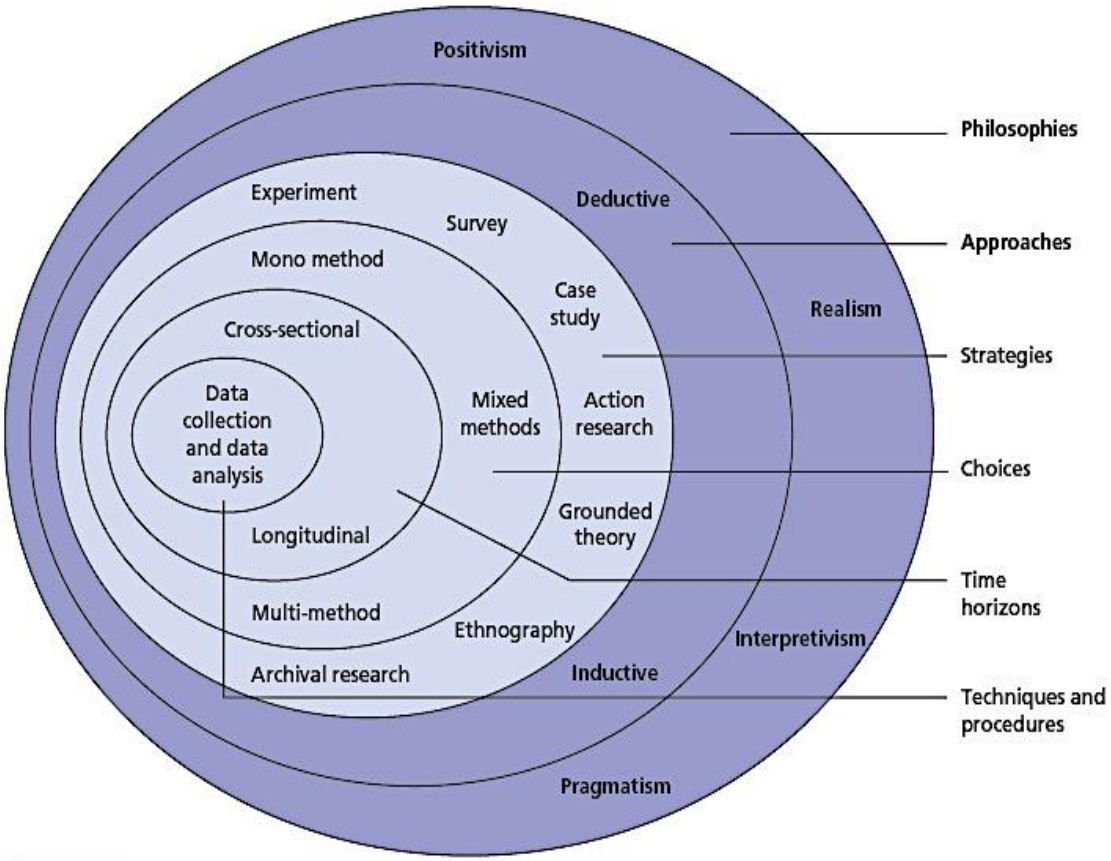


Figure 3.1. The Research Onion (Saunders et al. 2008)

3.2 Research Paradigm

In literature, the term 'paradigm' is often used in association with different research approaches. A paradigm according to Rossman and Rallis (1998) is a "shared understandings of reality". Those shared understandings are comprised of ontology, epistemology, methodology and methods (Scotland, 2012). The following sections explain those terms and discuss the differences and similarities among them.

3.2.1 Ontology Vs. Epistemology

According to Crotty (1998), ontology is "the study of being" (p.10). The pursuit to find out how reality is being established is the main purpose of ontological assumptions. Therefore, it is important for researchers to position themselves according to their understandings of realties in terms of what "things" truly are and how they function (Scotland, 2012). Epistemology however is "the study of the nature and forms of knowledge" (Cohen et al., 2007, p.7). The main concern of epistemological philosophy is to explore the means whereby knowledge is formed, obtained and transferred (Scotland, 2012). Thus, epistemological assumptions are meant to inspect, justify, and identify the nature, latitude and limitations of knowledge (Collins, 2010). Further, the different assumptions whether ontological or epistemological create unique characteristics of every research paradigm

(Scotland, 2012). Those divergent assumptions lead to divergent views with respects to reality and knowledge, which in turn constitute the basis for the selection of a specific research approach (ibid). That specific research approach is then reflected the methodology and methods, which are discussed in the following section. After that, an overall view of the existing research paradigms will be stated and discussed.

3.2.2 Research Method Vs. Research Methodology

Prior to excavating deep into the meanings and the different philosophical backgrounds of research methodology, it is sensible to define the term 'research' first. According to Creswell (2008), a research is " a process of steps used to collect and analyse information to increase our understanding of a topic or issue" (p.3). Another definition is presented by Kothari (2004), in which a research is "a scientific and systematic search for pertinent information on a specific topic" (p.1). Generally, any research is comprised of three main points: addressing the research question, gathering and analysing data in order to find an answer to the research question, and finally presenting the reached answer (Creswell, 2008). Figure 3.2 below depicts the general process whereby a research is developed and conducted.

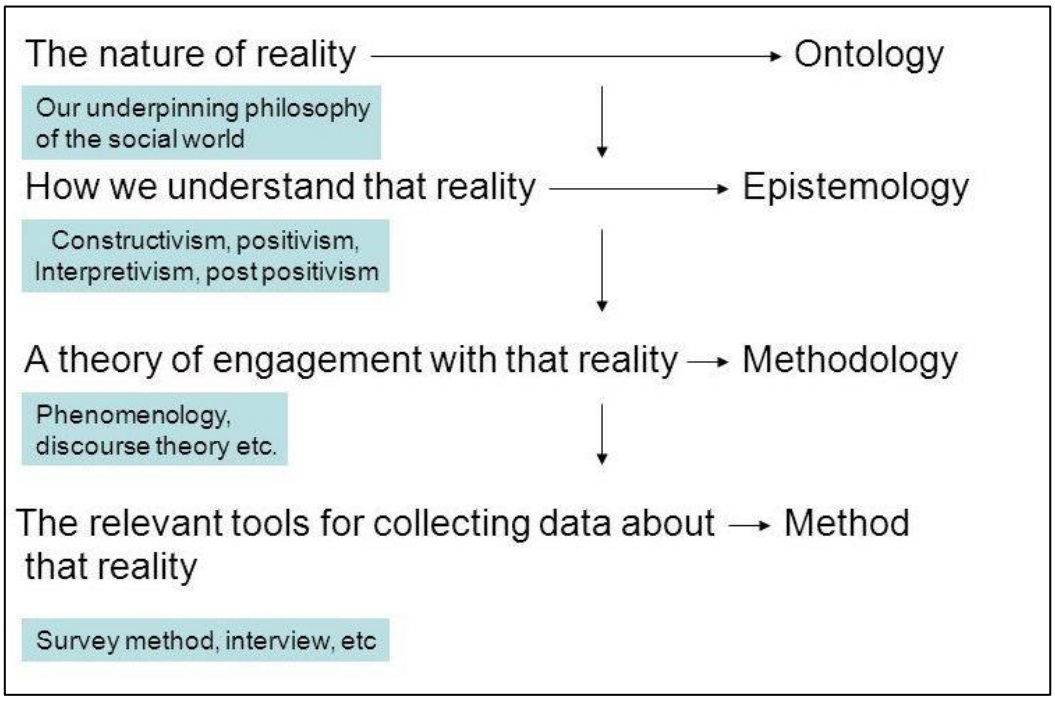


Figure 3.2. "The elements of the research process" (Bettany, 2016)

Further, another point that needs to be addressed at this stage is what distinguishes a research 'method' from a research 'methodology'. A research method is best described as all the techniques, approaches and processes, which are applied by investigator throughout the entire course of conducting the research (e.g. surveys, interviews, systematic literature review) (Kothari, 2004). On the other hand, a research methodology is a broader concept that in a sense represents the philosophy behind conducting the research. Research methodology is defined as "a systematic way to solve a problem. It is a science of studying

how research is to be carried out" (Rajasekar et al. 2013, p.5). Therefore, a methodology is meant to shape an overall plan of the research in order to gain the pursued knowledge while a method is only a part or a step within the bigger plan.

To remind readers, the previous two sections comparatively discussed the components of a paradigm. These components are: ontology, epistemology, method, and methodology. This was a prerequisite introductory to pave the way for the next discussion on the main existing research paradigms, and which paradigm was used for this study.

Positivism

During the period between 1930 and 1960, social science research was heavily embracing "positivism" as the leading ontological and epistemological paradigm (Gray, 2013). In terms of ontology, realism is the theoretical umbrella for positivism (figure 3.3) in which *realism* refers to "the view that objects have an existence independent of the knower" (Cohen et al., 2007, p. 7). As for the epistemological level, positivism is closely related to objectivism, in which science offers clarification and description in the form of common laws (Punch, 2014). Therefore, positivists believe that "reality exists external to the researcher and must be investigated through the rigorous process of scientific inquiry" (Gray, 2013, p.20). This justifies why positivism normally endeavours to form an understanding of a given phenomenon by scientifically testing theory (Myers, 1997). In its core, positivism debates that for 'something' to be considered 'real', one must be able to sense it, so that it can be touched, seen, heard, etc. Hence, philosophical speculation is not an approach embraced by positivist studies, but the empirical inquiry that is solely based on scientific observation (Gray, 2013). According to Orlikowski and Baroudi (1991) "positivist studies are premised on the existence of a priori fixed relationships within phenomena, which are typically investigated with structured instrumentation. Such studies serve primarily to test theory, in an attempt to increase predictive understanding of phenomena" (p.5).

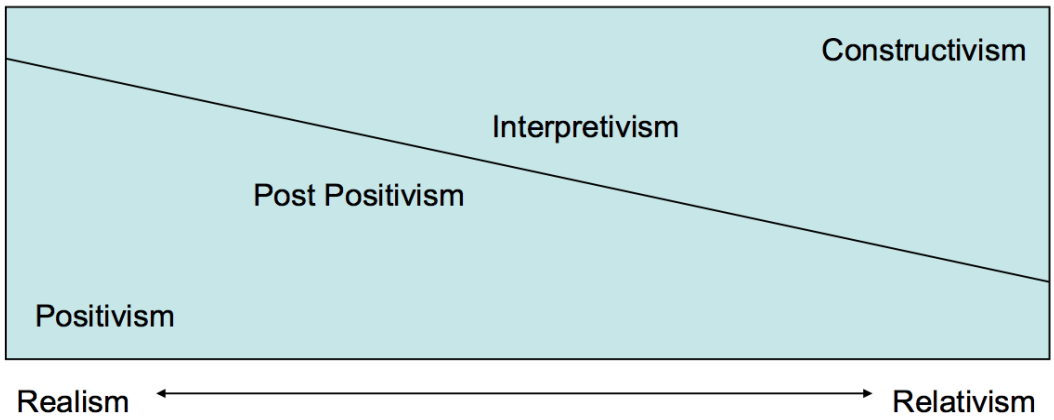


Figure 3.3. "Dual continuum of research philosophies" (Bettany, 2016)

Post-positivism

Positivism is the logical antecedent to post-positivism. Although the resemblance between the two stances on the epistemological (objectivism) and ontological (realism) levels is obvious, they have some dissimilarities. For instance, post-positivism acknowledges the existence of external reality out there, but forming knowledge about that reality is never perfect and complete. This is simply because such knowledge is being formed based on one's belief of the correctness of tested hypotheses (Popper, 1959). Further, post-positivism relies on the falsification code in which scientific theories cannot be confirmed factual unless all efforts to negate them fail (Ernest, 1994). However, this acceptance of scientific theories "must remain tentative forever" (Popper, 1959, p. 280). Accordingly, although post-positivism can still be classified as being 'objective' on the epistemological level, it falls however into the ontological position of "critical realism" rather than 'realism' as shown in figure 3.3. *Critical realism* emerged form realism in which "our knowledge of reality is a result of social conditioning and cannot be understood independently of the social actors involved in the knowledge derivation process" (Saunders et al. 2009, p.115).

Interpretivism

In essence, interpretivism searches for "culturally derived and historically situated interpretations of the social life-world" (Crotty, 1998, p.67). The underpinnings of interpretivism rely on the belief that "classification schemas" of the mind are the only mean by which the world is inferred (Williams & May, 1996). Therefore, unlike positivism, which is generally objective, interpretivism is perspectival, implying that the existence of the world is highly dependant on how different people perceive, experience and interpret it (Bettany, 2016). In other words, interpretivism acknowledges the existence of an external world; however, interpreting and understanding that world is subjectively carried out based on one's views and perceptions. Thus, in relation to research, "interpretive studies assume that people create and associate their own subjective and inter-subjective meanings as they interact with the world around them; therefore, interpretive researchers attempt to understand phenomena through accessing the meanings that participants assign to them" (Baroudi & Orlikowski, 1990, p.5). Further, on the ontological level, interpretivism is positioned closer to 'relativism' rather than 'realism' as shown in figure 3.3 (Bettany, 2016). *Relativism* reflects the belief that "the assumption that everything which we experience and think (the self, the idea of reason, truth, morality, religion etc.) is only something relative, and therefore has no essential endurance and no universal validity" (Krug, 2010, p. 224 as cited in Stanford Encyclopaedia of Philosophy, 2015). As for epistemology, interpretivism is widely regarded as being embracing subjectivity rather than objectivity.

Constructivism

Constructivism is typically viewed as the opposite epistemological and ontological stance to positivism. It was stated that for the standpoint of positivism "reality exists external to the researcher and must be investigated through the rigorous process of scientific inquiry". However, this notion is rejected among constructivists (Gray, 2013). They believe that reality, truth, interpretations are only created as a result of one's interaction with the world, implying that it is not possible to explore 'meanings'; rather, construct them. This is how constructivism justifies the disparate understandings people form in respects to the same phenomenon, which is simply because such understandings are being constructed independently by an individuals based on one's vision of the world (ibid). Constructivism thus considers some 'scientific techniques', including statistical analysis, being used in attempts to reach the 'truth' are no longer valid for such endeavours (Dills & Romiszowski, 1997). Therefore, on the ontological and epistemological level, constructivism is interrelated with interpretivism as both philosophical stances embrace 'relativism' and 'subjectivism' (see figure 3.3).

In conclusion, in order for this research to fulfill its aim and objectives stated previously in chapter 1, and to produce the intended contributions, a valid and sound research approach must be properly applied. Therefore, after careful consideration of the available research paradigms and approaches, the researcher, based on his structured and rigid impression of the world (ontology), believes that positivism is applicable to this research where a scientific approach involving identifying factors and testing them is best suited to study this problem (Orlikowski & Baroudi, 1991). The factors have been identified and stated in chapter 2 which are the constructs within the conceptual model. To measure those factors, related data were collected from participants using a quantitative method (survey questionnaires) because positivism is typically associated with quantitative methods (Punch, 2014). Hypotheses have also been formed accordingly and the outcomes of the hypotheses testing will be provided later on within this thesis.

Further, due to the scientific nature of the current study, it is appropriate at this juncture to shed light on the reasoning applied to study. Reasoning in that context reflects the approach by which the scientific research is carried out in terms of the relationship between theory and research. (Lockstrom, 2007). The reasoning approaches of scientific researches can be either *inductive* or *deductive* or a mix of both (ibid). The following section provides a discussion of both approaches, identifying the approach applied to the current research.

3.3 Research Reasoning (Inductive Vs. Deductive)

A question that arises in terms of research approach is whether to commence a given research with theory or should theory be generated from the research. In his answer to this question, Dewey (1933) highlighted two major approaches of inquiry, 'inductive discovery (induction) and deductive proof (deduction)'.

According to Gratton & Jones (2010) "inductive research is more often associated with

interpretative, qualitative studies. Here, the pattern is to collect data, and analyse the data to develop a theory, model or explanation" (p.27). By the application of observations, content analysis and/or other measurements, which take into consideration the context and the details of the events, inductive approach is normally associated with conceptualising or generalising an idea or outcome. Accordingly, such approach is more feasible with smaller sample size and qualitative data collection methods (Saunders et al. 2009).

As for the deductive inquiry approach, it is sometimes referred to as the 'top-down' logic because it moves from the general to the specific (Szyjka, 2012). Deductive approach is more appropriate with larger sample size. The collected data is then organised and coded using numbers and statistics in accordance with the design of the study (ibid). According to Gratton & Jones (2010), "Deductive research is more generally associated with positivist and quantitative research. It involves the development of an idea, or hypothesis, from existing theory which can then be tested through the collection of data" (p.26). The following table 3.1 summarises the major differences between the two approaches of inductive and deductive inquiry.

Table 3.1. Comparison Between Inductive and Deductive Inquiry (Saunders et al. 2009, p.127).

Inductive Inquiry	Deductive Inquiry
• Gaining an understanding of the meanings humans attach to events • A close understanding of the research context • The collection of qualitative data • A more flexible structure to permit changes of research emphasis as the research progresses • A realisation that the researcher is part of the research process • Less concern with the need to generalise • Gaining an understanding of the meanings humans attach to events • A close understanding of the research context • The collection of qualitative data • A more flexible structure to permit changes of research emphasis as the research progresses	• Scientific principles • Moving from theory to data • The need to explain causal relationships between variables • The collection of quantitative data • The operationalisation of concepts to ensure clarity of definition • The application of controls to ensure validity of data • A highly structured approach • Researcher independence of what is being researched • The necessity to select samples of sufficient size in order to generalise conclusions • Scientific principles • Moving from theory to data

In terms of the current research, when considering the characteristics of both inductive and deductive approaches and comparing them to the characteristics underpinning the approach of the current research, it can be clearly seen that this research applies the deductive approach. Reasoning for the use of the deductive approach is as follows: first, this research

is a positivist one, and positivism is closely linked to the deductive approach (Gray, 2013). Second, a main part of this study is to explore relevant technology adoption theories in order to develop a theoretical model and propose the hypotheses to be empirically tested. The data used to examine the validity of the model and the hypotheses are quantitatively collected (Gratton & Jones, 2010). All of these facts regarding the research methodology indicate the application of the deductive approach to the current study. Having identified the philosophical position of this research as well as the applied approach of inquiry, the next section provides a comparative discussion between qualitative and quantitative research methods.

3.4 Research Method (Qualitative Vs. Quantitative)

Crotty (1998) defines methods as "the specific techniques and procedures used to collect and analyse data in which the collected data will either be qualitative or quantitative" (p.3). Therefore, a research method is best described as all the techniques, approaches and processes, which are applied by investigator throughout the entire course of conducting the research (e.g. surveys, interviews, systematic literature review, etc.) (Kothari, 2004). Adopting a methodical stance is always a reflection of the researcher's epistemological and ontological position because it is inevitable to conduct any type of research work without embracing a philosophical standpoint (Grix, 2004). In general, the key differences between the two approaches of qualitative and quantitative are the data collection techniques as well as their level of analysis. Following is a discussion of both qualitative and quantitative methods.

3.4.1 Qualitative Methods

In essence, qualitative methods are popular for the study of complex social phenomena by carefully considering the standpoints and opinions of the audience involved (Glesne, 2006). It gives researchers the ability to deeply analyse collected data by dealing with words and the meaning within words and data (Myers, 1997). Qualitative methods rely on the conjecture that variables within any given event are challenging to measure and estimate due to their complex nature and based on the philosophical notion that realty cannot be explored; rather socially constructed (Szyjka, 2012). It is thus very common for research of this type to contextualise, comprehend and explicate a situation. Research that applies qualitative methods typically involves applying inductive inquiry, leading to the generation of a theory or hypothesis (ibid). Moreover, throughout the course of data collection, such methods are carried out in a naturalistic setting where the investigator is personally invested and deemed to be the key instrument of the research. The collected data then require deep and detailed analysis in a time-consuming process. Therefore, qualitative methods are more feasible with smaller sample size (Saunders et al. 2009; Szyjka, 2012). Following are brief descriptions of some of the commonly used qualitative data collection methods.

Interviews

In general, interviews are basically a dialogue between two persons and typically conducted to acquire the type of data that is difficult to interpret by the use of statistical measurements (Gratton & Jones, 2010). Therefore, interviews focus on gathering the data that corresponds to the enquiries of 'why' and 'how' in lieu of 'how many' and 'when' (ibid). Interviews are widely classified into three fundamental categories: structured, unstructured and semi-structured (Gill et al. 2008). Structured interviews are basically verbally delivered surveys, in which they consist of a list of reprogrammed questions and scope; thus, they are not of much aid when deep understanding of a phenomenon is pursued. Contrariwise, unstructured interviews are typically conducted with no predetermined list of questions and no defined scope. The progress of such interviews is usually determined based on the enthusiasm and cooperation of the participants, which is something not easy to achieve given the fact that unstructured interviews are unorganised, confusing and time-consuming (ibid). Further, the third type is semi-structured interviews in which they are designed to help with discovering what certain people experience and feel about something that researchers are interested in. They are simply conversations with participants about a certain topic where only few key questions are preset by the interviewer. However, unlike structured interviews, semi-structured interviews are not necessarily limited to those questions, and the conversations can expand to cover more areas in order to find out how the participants feel about something (Miles & Gilbert, 2005).

As far as the research at hand is concerned, interviews were not considered to be appropriate for the major data collection phase, given its different philosophical position from that of this research, which has been clearly stated earlier within this chapter. Further, this research study applies a quantitative approach whereas interviews are typically associated with qualitative research (Gill et al. 2008). However, in the evaluation process of this research, following the major research data analysis, semi-structured interviews with 10 participants were conducted by telephone as a follow up of the survey questionnaires conducted, seeking insights and opinions on the research outcomes (Kothari, 2004). More detailed information on the evaluation process is provided later within this thesis (chapter 6).

Observations

Observation is a learning process by which observers can form an understanding of a certain situation using their five senses (Kawulich, 2005). Observations take place through the involvement of the observer in the day-to-day activities of the people under observation in the natural setting. During the observation process, the observer normally avoids consistent engagement with whom being observed in order to maintain a high level of naturalistic context as much as possible (Trochim & Donnelly, 2008). This technique enables observers to perceive nonverbal manifestation of feelings, establish a firm comprehension of how, why, where and when interactions among participants take place, and grasp the time needed to complete various activities (Kawulich, 2005).

Observations were not used in the current study because observations are categorised under qualitative research methods while this study is quantitative-oriented (Kawulich, 2005).

Focus Groups

Recently, the method of focus groups has become widely popular in the venue of social and applied research. It is sometimes refereed to as 'group interviewing' in which a group of people gathers with the presence of the interviewer to discuss and share their viewpoints on the research topic in a nondirective approach and an open-ended manner (Taylor et al. 2015). The role of the interviewer is to facilitate the discussion and make sure it runs as smoothly as possible with equal opportunities for all participants to express their perspectives. The main purpose of focus groups is "to let people trigger one another, suggesting dimensions and nuances of the original problem that any one individual might not have thought of. Sometimes a totally different understanding of a problem emerges from the group discussion" (Rubin & Rubin, 1995, p.140). According to Hennink (2014), it is more feasible for focus groups to have a maximum of 10 participants with similar backgrounds, talking about as few issues as possible to maintain high concentration level of the discussion. The length of the each session typically ranges from 1 hour to 90 minutes (ibid). The approach of focus groups is highly qualitative in which it is less structured that quantitative data collection approaches; therefore, it requires deep analysis of words and meanings rather than mathematical and statistical measures (Edmunds, 1999).

In terms of this research, given its association with qualitative research rather than quantitative, the researcher discarded the method of focus groups to avoid contradiction between research philosophy and design in one side, and data collection and analysis in the other side.

Content analysis

This approach refers to the process of analysing a given content (e.g. texts, videos, radio broadcasts, photographs) of communications (Gratton & Jones, 2010). Content analysis, similar to observations, is highly subjective because it depends on how the researcher perceives and understands the content in terms of the meanings of words and concepts included within the content being analysed (ibid). This approach requires careful considerations in terms of sampling method, content appropriateness, content validity and integrity. Moreover, being unobtrusive investigation approach, a content analyst might face difficulty in phenomenon interpretation due to the lack of interaction with the subjects or events under exploration (Gratton & Jones, 2010). Finally, content analysis is widely categorised under the qualitative data collection methods (Gill et al. 2008; Saunders et al. 2009). Therefore, it was not applied to the current research due to the application of quantitative research methods.

Case Studies

One of the commonly used qualitative analysis method is the case study technique. Odum (1929) defines it as "a technique by which individual factor whether it be an institution or just an episode in the life of an individual or a group is analysed in its relationship to any other in the group" (p.229). Another comprehensive definition is given by Kothari (2004) in which a case study is "a form of qualitative analysis where in careful and complete observation of an individual or a situation or an institution is done; efforts are made to study each and every aspect of the concerning unit in minute details and then from case data generalisations and inferences are drawn" (p.113). This method pays more attention to the depth of analysis rather than the breadth by focusing on a controlled number of events or situations and their interrelations. Another aspect of the case study method is that it is carried out throughout a prolonged period of time in order to allow the investigator to form in-depth understandings of the subject/events/situations under investigation (Scotland, 2012).

However, the case study method was deemed inappropriate for the purpose of the current research due to differences in philosophical and methodical standpoints mentioned earlier. Another reason for discarding this method is the fact that it only facilitates in-depth examination of limited units of analysis (e.g. individuals), and therefore contradicts with this study's endeavour to examine a large sample of older adults.

3.4.2 Quantitative Methods

Quantitative methods are normally associated with the paradigm of positivism so that they are applied when there is an assumption that it is impossible to gain understandings of realties in a subjective manner, but rather objectively (Jupp, 2006; Szyjka, 2012). Therefore, the job of the investigator remains detached to the situation or event under examination and should not subjectively interpret the research results. In such methods, the researcher generally identifies, categorises specific variables, and then hypothesises relationships between those variables in order to carry out certain examinations, such as correlational analysis, to determine the validity of presumed relationships (Szyjka, 2012). Further, exploration processes within the quantitative methods develops from general to the specific, clearly indicating a deductive inquiry approach. Subsequently, the collected data is then organised and coded using numbers and statistics in accordance with the design of the study (Glesne, 2006). Further, "quantitative research provides results that can be generalized to a specific population as it based on statistical sampling of the target population" (Edmunds, 1999 p.2). Following are brief descriptions of some of the commonly used quantitative data collection methods.

Laboratory experiments

The beginning of the 20th century witnessed the actual birth of social science laboratory experiments, meaning that it is no longer only limited to the physical science (Webster and Sell, 2007). Such experiments provide the researcher with the ability to control independent

and dependent variables as well as the ability to manipulate surrounding conditions in order to be able to observe and determine the cause-and-effect relationships between variables (Jupp, 2006). In terms of this research, laboratory experiments are irrelevant to the purpose of this thesis; thus, none were conducted. The following technique of quantitative research to be discussed is the survey questionnaires technique, which has been applied to this research as the main data collection instrument.

Survey Questionnaires

In its broadest meaning, survey questionnaires "include all techniques of data collection in which each person is asked to respond to the same set of questions in a predetermined order" (Saunders et al. 2009, p.360). In essence, questionnaires are used to obtain desired information from an identified audience by posing to them a standardised set of questions. They are usually applied for quantitative research designs that require large sample size with fairly simple data (Gratton & Jones, 2010). This is considered one of the most advantageous aspects of questionnaires. Other advantages include: anonymity, sample accessibility, organised data, no time pressure for participants and diminished bias. On the other hand, the disadvantages of questionnaires might appear on the form of the following points: the necessity in many cases to over simplify the questions, the inability to inquiry responses, amiss questionnaires and in many cases the low response rate (Saunders et al. 2009, p.360). In general, there are two designs of questionnaires in terms of who completes the questionnaire. The first is the 'self-completion' design where the participants themselves complete the questionnaires. The other type is the 'interviewer completion' design where the investigator sets with the participants and complete the questionnaire based on their answers (Gratton & Jones, 2010).

In terms of this research, as mentioned earlier that this research study applies a positive scientific approach in which a quantitative approach involving developing and distributing survey questionnaires is the data collection method (Denscombe, 2003). In addition to the previous philosophical justification, the employment of quantitative survey questionnaires as the key instrument for this research is pivotal in order to test the proposed conceptual framework and hypotheses. Quantitative survey questionnaires assist the researcher to obtain the raw data in the form of structured numbers, which make them easier to be organised, classified, and transformed into meaningful datasets in order to be statistically and analytically validated in the context of real life (Gratton & Jones, 2010). Moreover, using quantitative survey questionnaires allow the researcher to generalise the findings to other members within the population of the research sample (Newsted et al, 1998). Further, the use of the survey questionnaires is defensible because this method is proven to be of high convenience and accessibility as well as its efficiency in terms of cost, time and effort (Gilbert, 2001). All of the aforementioned positive characteristics of quantitative survey questionnaires made it a very popular instrument among IS researchers (Newsted et al, 1998). Therefore, this research employed quantitative survey questionnaires as the main instrument for data collection. The questionnaire consisted of demographic questions; followed by close-ended, 7 Likert scale questions related to the use of the MOI e-portal.

Three main forms of quantitative survey questionnaires have been used to suit the requirements and desires of each individual participant. Following is a description of those forms:

Paper-based questionnaires

Is a questionnaire that uses papers as the medium in which the questionnaire is written and conducted by participants. This form is categorised under the 'self-completion' design because the participants themselves complete the questionnaires. It is advantageous in terms of time because participants can complete it at their pace with no pressure, which then is reflected on their answers' precision and completeness (Brace, 2008). In terms of this research, paper-based questionnaires were employed to collect data for the pilot as well as the final data collection phase. For the pilot survey, the researcher collected 92 paper-based questionnaires out of 257 completed responses. As for the final survey, all collected responses (937) were paper-based questionnaires.

Face-to face questionnaires

This form reflects the 'face-to-face' manner in which the questionnaire is administered where both the researcher and participant are in the same location. In this form, the researcher poses the questions and writes down or types the answers that he/she receives from the participants (Gratton & Jones, 2010). As for this research, the face-to-face questionnaires technique resulted in 41 responses during the pilot phase and 176 during the final phase in which the researcher asked the questions and then wrote down the answers he received from the participants.

Internet-based questionnaires

Internet-based questionnaires are characterised by their online environment in which it is provided to potential participants in digital format. Online questionnaires are facilitated by using the World Wide Web (WWW) as the core platform, and can be delivered using online communication tools (e.g. SurveyMonkey), email surveys and downloadable surveys (Marsden & Wright, 2010). As for the current research, this technique was only used during the pilot phase, which resulted in 165 completed Internet-based. However, the researcher had learnt after completing the pilot phase that this method is of relative difficulty for some older adults; therefore, it was discarded in the final phase in order to increase the possibilities of receiving completed and valid responses.

Having identified the methodical standpoint of this research, the following section sheds light on the types of data used for the completion of this thesis in terms of its source (primary and secondary).

3.5 Time Horizons

One of the aspects any researcher must determine is whether the study intends to capture a

particular ‘snapshot’ of reality in a specific period of time, or is more of an on-going study that intends to capture a series ‘snapshots’ over pre-determined time frame to grasp any possible changes in aspect(s) under investigation (Saunders et al, 2009). Accordingly, in terms of time horizon, the research onion, which was presented at the beginning of this chapter, proposed two classifications, Cross-sectional and Longitudinal research. ***Cross-sectional research*** examines data from a specific time period where each case within data is examined only once (Menard, 2002). This type usually pertains to studies applying survey questionnaires for a large sample in order to examine a particular phenomenon at a specific point in time (Easterby-Smith et al, 2006; Saunders et al, 2009). As for ***Longitudinal research***, they typically examine data obtained across time more than once to track changes. Therefore, this type is suitable for measuring change in human behaviour (Menard, 2002).

In terms of the research at hand, it is a cross-sectional one because it intends to capture the factors that influence older adults in Hail city in terms of Internet adoption and e-government services use in a particular point in time (refer to research aim and research questions in chapter 1, section 1.2).

3.6 Primary Vs. Secondary Data

Data collected and used in a research study can be classified based on their source and origin into two categories: primary and secondary. *Primary data* refers to the data that are collected and generated exclusively for an ongoing piece of research. This reflects the extent to which such data is novel, and that it has never been interpreted nor analysed by any other source before (Jupp, 2006). There are plenty of ways whereby primary data is collected, including surveys and observations (Zikmund et al. 2009). Comparatively, *secondary data* refers to any set of data that have already been acquired and analysed by other researchers and for completely different purposes to that of the current research (Jupp, 2006; Saunders et al. 2009). Further, secondary data, when compared to primary data, can be collected in easier, faster and cheaper ways (Zikmund et al. 2009). It is important when using secondary data to specify the source, the date of creation and the intellectual owner of the data (Stewert, 1984). A typical example of secondary data is the published studies conducted by other researchers (Cooper & Schindler, 2013). Secondary data is usually archived in the forms of books, journal articles, industry research, governmental and executive reports (Stewert, 1984).

As for the research at hand, both primary and secondary data have been employed. First, primary data was used as the major set of data that were employed to fulfill the aim of this research, which is to identify, explain and understand the adoption, use and diffusion of e-government services within the older adults population (50+) of a vicinity in Saudi Arabia. Throughout the efforts to achieve this aim, the generation of primary data took place as follows: during the process of content validation where a set of primary data was obtained from a 10 experts panel regarding the validity of the survey questionnaire content (more details about content validity outcomes are provided later within this chapter). In addition,

there were three more primary datasets generated throughout the development of this research, which are related to the pilot, the final and the evaluation phases. During the pilot and the final phases, the researcher carried out two major surveys targeting older adults in Hail city in the kingdom of Saudi Arabia, which resulted in the collection of the two primary quantitative datasets mentioned above. Finally, during the evaluation process, the researcher conducted semi-structured interviews with 10 participants, which resulted in the generation of the final primary qualitative datasets (more details about the evaluation process are provided in chapter 6).

As for secondary data, it was used for this research as follows: throughout the course of reviewing existing literature on IS and technology adoption where tens of journal and conferences academic papers, governments reports, international organisations studies and other related books have been used to form an overall understanding of the topic being investigated. Forming such understandings of the research at hand through the use of secondary data resulted in identifying the research gap, defining the research problem, constructing the theoretical underpinnings of the research, developing the research method, and completing the discussion and evaluation processes. Having identified primary and secondary data used within this research, the following section provides an overview of the selection process of the quantitative analysis methods used to test the primary collected data.

3.7 Quantitative Analysis Methods

After having collected the required data, the next step for this research was to determine what quantitative analyses methods are needed in order to empirically test the proposed hypotheses and validate the conceptual framework. To refresh the readers' memory, in terms of this study, the proposed conceptual framework and hypotheses were dedicated to examine and understand factors of influence with regards to older adults' intentions to use e-government services in Saudi Arabia. Based on the conceptual framework and its embedded constructs, the study proposed eleven hypotheses, aiming to determine the cause and effect relationships between independent and dependent variables as well as the direction of such relationships (positive or negative). For example, does perceived compatibility have a positive causal effect relationship with older adults' intentions to use e-government services, or does perceived cyber risk have a negative causal effect relationship with older adults' intentions to use e-government services? Regression analysis is an analytical method for quantitative data that enables researchers to determine whether or not causal effect relationships exist among variables (De Vaus, 1996).

Regression analysis

Regression is an analytical technique that is used to predict the causal effect relationships between variables within a model (De vaus, 1996; Cooper & Schindler, 2013). This can be explained as follows: X is the independent variable that effects the dependent variable Y. Therefore, X is sometimes titled as the predictor, explanatory or exogenous variable

whereas Y is widely referred to as the outcome or endogenous variable (Gefen et al. 2000; Urbach & Ahlemann, 2010). What regression analysis actually does is discover the best "straight-line" relationship between X and Y in order to establish the extent of change in the outcome variable Y for each unit change in the predictor variable X (De Vaus, 1996).

To reflect the previous explanation of regression analysis on the research at hand, the X variables are represented within the theoretical model by the set of constructs that have been hypothesised to have an impact on the Y variable, which is represented in this case by the construct of older adults' intentions to use e-government services. The employment of regression analysis test generates the p-values whereby understandings on the statistical significance impact that X might have on Y can be established. P-values are simply "measures of the strength of evidence against the null hypothesis H_0" (Dorey, 2010, p. 2297). A null hypothesis "suggests that there is no relationship between the variables under investigation" (Gratton & Jones, 2010, p.17).

Statistical regression analysis can be bivariate or multiple regression (Campbell & Campbell, 2008). Bivariate regression is used to examine the relationship between a pair of variables within the dataset while the multiple regression technique is designed to examine the relationship between one dependent variable and two or more independent variables (ibid). Accordingly, this research applies the multiple regression analysis technique because the goal is to examine the relationships between the dependent variable (older adults' to use e-government services) and all the other nine independent variables. Following is a description of the multiple regression technique.

Multiple Regression

Multiple regression is "the process of calculating a coefficient of multiple determination (or multiple regression coefficient) and regression equation using two or more independent variables" (Saunders et al. 2009, p.462). Subsequently, a high significance value output (as a rule of thumb, more than 0.05) indicates that the independent variable has no explanatory power on the dependent variable whereas a value less than 0.05 means that the dependent variable can be predict by the model (ibid).

Reflecting on the current research, for each independent variable within the model, there have been specifically assigned several items by which data was acquired, and for multiple regression analysis to be simultaneously calculated in this case (using several items for each independent variable), multivariate analysis approach is best suited (Vyas, 2013).

Multi-variate Analysis

The techniques of multi-variate analysis provide an understanding on the simultaneous relationships amongst three or more variables by focusing on the examination of covariance or correlations (De Vaus, 1996; Cooper & Schindler, 2013). Since the theoretical model of the research at hand consists of 11 constructs in total, the aforementioned feature that multi-variate analysis offers will facilitate simultaneous estimation of the model as a whole. It is

this feature that has made the techniques of multi-variate analysis very popular and widely used by nearly all venues of scientific enquiry (Dillon & Goldstein, 1984). This multi-variate approach can be carried out using the statistical methodology of Structural Equation Modeling (SEM), which is discussed in the following section (Vyas, 2013).

Structural Equation Modeling (SEM)

Towards the end of the second half of the 20th century, the statistical methodology of structural equation modeling (SEM) had flourished as a result of the advancements in computing statistical capabilities (Trochim & Donelly, 2008). Such powerful capabilities have facilitated the analysis of complex surveys and the estimation of complex models (Moser & Kalton, 1971). According to Hair et al. (1998), "Structural equation modeling provides the appropriate and most efficient estimation technique for a series of separate multiple regression equations estimated simultaneously" (p.17). Therefore, SEM allows theory investigation through the simultaneous testing of hypotheses designated to study a specific phenomenon (Trochim & Donelly, 2008). Further, SEM also facilitates multi-items representations for each construct within the model (MacCallum & Austin, 2000). The latter feature is of most importance to the current research as each construct applied is represented by many items to measure the constructs.

SEM is considered as a part of the techniques of the second-generation data analysis by which complex problems within IS research can be attended and dealt with (Chin & Todd, 1995). Particularly, the second-generation techniques surpass the first-generation techniques (e.g. linear regression, LOGIT & ANOVA) in the venue of behavioural research that are based on multifaceted causal modeling (Lowry & Gaskin, 2014). The second-generation techniques "offer extensive, scalable and flexible causal-modeling capability" whereas the first- generation techniques "offer limited modeling capabilities, particularly in terms of causal modeling" (Lowry & Gaskin, 2014: 123).

These advantageous attributes of the second-generation techniques have made SEM methodology widely applied for data analysis within IS research (Urbach & Ahlemann, 2010). Following are some examples of the use of SEM within IS behavioural research: behaviour on social networking sites (Chen & Sharma, 2015), perceived website complexity (Nadkarni & Gupta, 2007), e-government adoption and use (Ozkan & Kanat, 2011; Abu Nadi, 2012; Albesher, 2015; Kurfalı et al. 2017), Internet adoption (Kim et al, 2007), e-services acceptance and use (Luqman & Abdullah, 2011) and e-banking services adoption (Al-Majali & Mat, 2011). All of the above-mentioned facts and capabilities of SEM have encouraged the researcher to choose it as the main analysis approach for the research at hand. Having determined the analysis methodology, the next section discusses the software package used.

SmartPLS

There are many renowned software packages can be used for SEM analysis methodology, including AMOS, STATA, SmartPLS, EQS, WebSEM and LISREL. Out of those software packages, SmartPLS was deemed of most suitability for this research. SmartPLS is characterised by its ease of use and the functionalities it offers, including reliability and validity measurements. It is also characterised by its robust support community that freely provides a wide range of online (e.g. YouTube) learning resources and materials (Lowry & Gaskin, 2014).

SmartPLS software applies the analysing technique of Partial Least Squares based Structural Equation Modeling (PLS-SEM) (Hair et al. 2011). PLS is comparable to using multiple regression analysis in which "the primary objective is to maximize explained variance in the dependent constructs but additionally to evaluate the data quality on the basis of measurement model characteristics" (Hair et al. 2011, p.140). PLS is also appropriate for simultaneously estimating relatively complex structural model that includes several constructs and several items (Gregoire & Fisher, 2006; Hair et al. 2011). Moreover, in the area of Management Information Systems (MIS), PLS has become broadly popular to model complex relationships and to form valid conclusions from the controlled sample to the entire population (Sharma & Kim, 2012). All of those reasons have led to selecting PLS as the analysis technique in this research.

3.8 Research Site

The research takes place in Saudi Arabia (officially The Kingdom of Saudi Arabia). The country is geographically located in the furthermost area of southwestern Asia (figure 3.4), where it comprises approximately four-fifths of the Arab Peninsula land, with a total area of about 2,000,000 k^2 (figure 3.5) (Saudi General Authority for Statistics, 2015). As shown in figure 3.5, Saudi Arabia is bordered by seven other Arab countries as well as the Arabian Gulf and the Red Sea. As of 2016, the total population of Saudi households was 3.417.788 with 20.064.970 residents (Saudi General Authority for Statistics, 2016). The number of citizens aged 50+ was approximately 2.800.000 comprising around 14% of total Saudi population (Saudi General Authority for Statistics, 2016). The increase in the elderly populations is a worldwide phenomenon known as the "population ageing", in which it is a direct result of the increase in life expectancy and the decline in fertility rate (United Nations Population Division, 2017).

Figure 3.4. World Map/ Saudi Arabia Located at the Heart (in green)

Figure 3.5. Saudi Arabian map showing bordering countries

Due to resource constraints, it was not possible to sample the entire population of Saudi Arabia; therefore, the City of Hail was selected as the research site. As of 2016, the population of Hail city reached around 700,000 in which about 13% of the total population fell into the category of older adults (50+) (Saudi General Authority for Statistics, 2016). The older population of Hail is considered high when compared to other medium-sized cities that have comparable total population to Hail city. Table 3.2 below shows that the older population for both genders in Hail is higher than the other regions except for one region, which depicted similar figures.

Table 3.2. Saudi Citizens Population (50+) by gender & Administrative Region

Administrative Region	Male (Thousands)	Female	Total
Hail	39,674	40,649	80,323
Tabouk	40,494	41,009	81,503
Northern Boarders	17,085	18,472	35,557
Najran	25,299	27,357	52,656
Albaha	30,206	37,067	67,282
Aljouf	22,023	21,084	43,107

Source: (Saudi General Authority for Statistics, 2017)

The city is located in the heart of the northern region of Saudi Arabia (figure 3.6). It is also considered to be the capital of the north in which it links all the other northern cities of Saudi Arabia with the capital city of Riyadh, the holy city of Mecca, and the southern regions of the country. In addition, a considerable percentage of the country's agricultural production comes from Hail Province. The city has a regional airport that offers flights to some surrounding Arab countries, and the government has decided to build a new international airport in the city. Further, to emphasise the importance of Hail city, in 2011, the former King has launched the huge project of Hail Industrial city. Hail city is a popular destination for tourists as it is famous for its historical sites and desert sports (International Rally). Some panoramic pictures of the city are provided in the appendix 3-1. These characteristics of Hail city suggested that it is an important city that is also a suitable context for this research. Further, the principal researcher has established contacts and access to the city that provided further reasons for its selection as the research context. Having provided reasoning with regards to the research site selection, the following section provides reasoning for specifically selecting the MOI e-portal to be studied.

Figure 3.6. Saudi Arabian Map / Hail Province in green

3.9 MOI e-portal (Absher Platform)

In 2006, the Saudi government represented by the ministry of communications and information technology launched the first National e-government Strategy & action plan (E-Government Program, 2006). Like any project, the e-government program of Saudi Arabia had a vision statement, which stated "By the end of 2010, everyone in the Kingdom will be able to enjoy – from anywhere and at any time – world-class government services offered in a seamless, user-friendly and secure way by utilizing a variety of electronic means" (E-Government Program, 2006. P.7). Further, in addition to this vision, the e-government program of Saudi Arabia had specified a certain objectives to be achieved by the implementation of the program. These objectives fell into three main categories: offering improved e-services (e.g. user-friendly, 24/7 access and uppermost security standards), raising internal efficiency and effectiveness (e.g. paperless intra-governmental interaction and governmental e-procurement), and lastly partaking in the country's prosperity (e.g. foundation of the information society and enhance society's productivity) (ibid).

Further, as far as the MOI e-portal is concerned, being part of the e-government program of Saudi Arabia, the objectives for developing the portal are similar to the above mentioned with more detailed goals. Following are some examples of the MOI e-portal goals that has motivated the construction of the portal:

- Reduce the number of visitors by providing the services electronically.
- Work with all government sectors electronically.
- Minimise counterfeiting and fight document fabrication.
- Provide a safe working environment for the employees.
- Simplify working procedures.
- Accomplish the work easily at any time, anywhere (Saudi General Department of Passports, 2017).

The MOI e-Portal (https://www.moi.gov.sa) is an integrated governmental e-platform that links together various governmental bodies, such as the civil affairs, passport and traffic departments in order to facilitate and provide e-government services to citizens and expatriates. The portal is publicly known as 'Absher', which is the name that the ministry of interior has given to its portal. Absher is an Arabic word closest to the meaning of 'at your service'. The following figure 3.7 exhibits a capture of the MOI e-portal home page (more captures of services depicted in appendix 3-2).

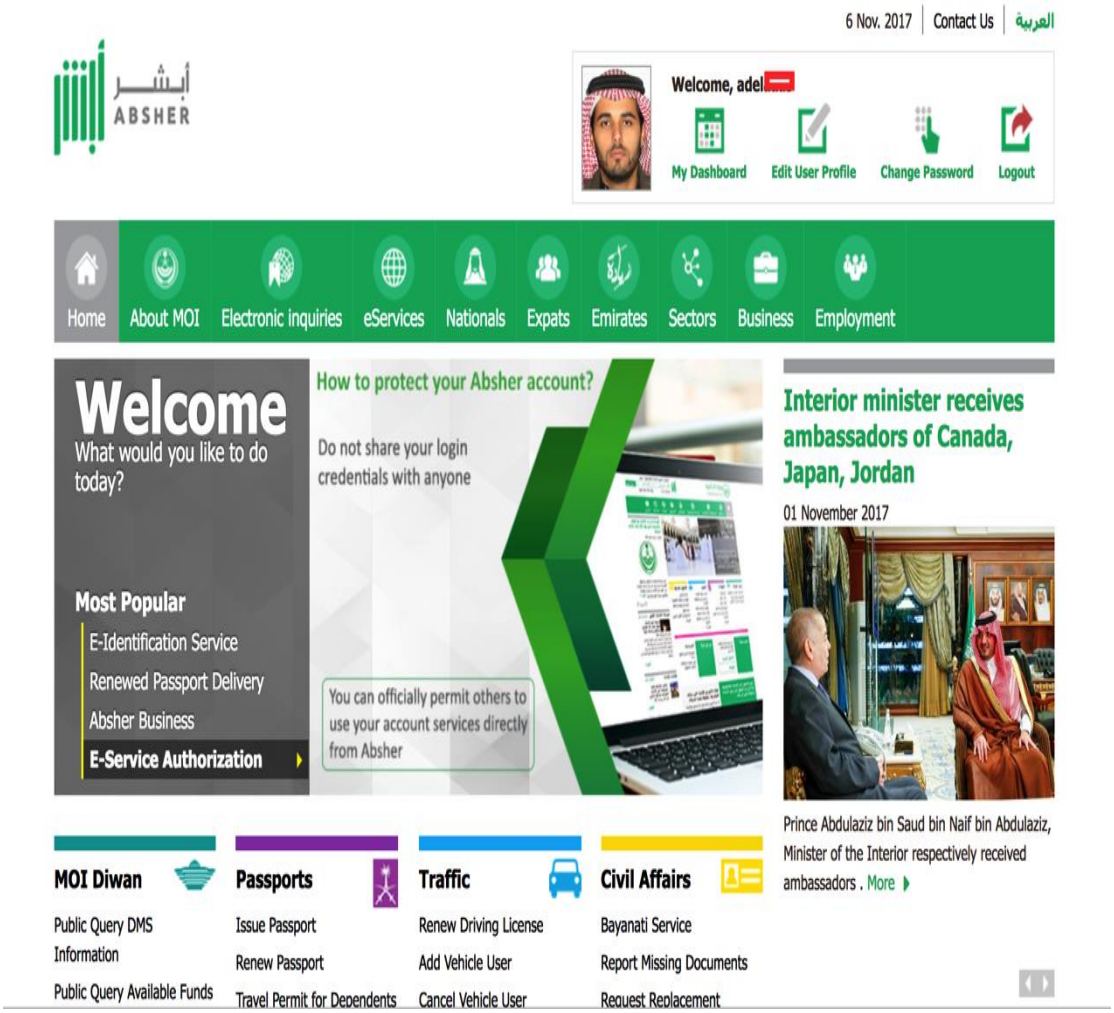


Figure 3.7. MOI e-portal Home Page

The Saudi government has launched various governmental portals that provide e-services to citizens, such as the ministry of foreign affairs e-portal, the ministry of education e-portal, the ministry of labour e-portal, and the ministry of environment, water & agriculture e-portal. However, the MOI e-portal has been specifically chosen for this study because of its relevance and importance to almost every Saudi citizen. For instance, each citizen has his own unique civil ID number, which is part of the services provided by the civil affairs department. Moreover, passport and traffic departments also provide services to millions of citizens and complete millions of orders every year. To offer an insight into the services provided by Absher and their turnaround, following is a service usage statistics (table 3.3) of the MOI e-portal services for the years 2014, 2015 and 2016. Having provided the reasoning behind the selection of the MOI e-portal, it is appropriate at this juncture to discuss the process of instrument validation conducted for this research.

Table 3.3. MOI e-portal usage statistics

Year	2014	2015	2016
Registered users	2.084.185	1.852.680	1.900.380
Cleared orders (Passports)	10.198.842	12.084.949	15.929.673
Cleared orders (Traffic Control)	1.034.969	1.461.167	1.952.139
Cleared orders (Civil Affairs)	3.553.205	3.634.254	4.665.172

Source: Saudi National Portal (https://goo.gl/FnfPQG)

3.10 Instrument Validation

The validation process in any research is a reflection of the extent to which the investigator desires to measure. Each validity measurement has its own characteristic whereby true distinctions between the research participants can be derived (Cooper & Schindler, 2013). Instrument validation is "a critical step that researchers should employ in order to ensure a generation of scientifically valid knowledge" (Kim, 2009; p.1178). Therefore, it was imperative for this research to comply with validation procedures in order to establish reliability of the findings. The process of instrument validation began with content validity; followed by pilot testing, and finally reliability and construct validity measurements (Kim, 2009).

3.10.1 Content Validity

The first stage of Instrument Validation for this research began with content validity. Content validity is meant to determine the relevance and representativeness of the questions in the way that they measure what they are meant to measure (Yaghmaie, 2003). In other words, to make sure that the questions or scales used in the survey are logically and adequately covering the studied topic. Saunders et al. (2009) suggested two techniques to examine the validity of content; first is to derive appropriate justifications from related literature, and second is to apply the technique of a panel feedback. The latter requires the participation of a group of individuals (expert panel) who have some knowledge about the research topic so that they provide their assessments of each question or scale used in the survey. For each question, each member of the panel will have three assessment choices:

'essential, useful but not essential or not necessary' (ibid). In terms of this research, the technique of the panel reviewers was applied to establish content validity. It was selected because it contributes to the enhancement of survey questionnaire. The reviewer's panel typically also provides suggestions for improvements in terms of the survey completion duration, clarity of layout and instructions, questionnaire attractiveness and any other comments they believe are worth mentioning (Bell, 2005).

For any research's instrument to be validated (in this case the survey questionnaires), it must meet certain requirements. Those requirements were derived from the work of Lawshe (1975) in which the following steps were conducted: First, after the questionnaire design, it was submitted to a Content Evaluation Panel (CVP), which consisted of ten members; eight of which were academic affiliates whereas the other two reviewers were older adults citizens (50+) (refer to table 3.4).

Table 3.4. Content Validation - Expert Panel

Reviewer	Discipline
A	PhD/MIS
B	PhD/MIS
C	PhD/MIS
D	PhD/MIS
E	PhD/Computer Science
F	Masters/MIS
G	Masters/Management
H	Masters/ Computer Science
I	Older adult citizen
J	Older adult citizen

Second, CVP members were asked to provide their evaluation against each survey question (item) as follows:

"Is the skill (or knowledge) measured by this item

—Essential

—Useful but not essential, or

—Not necessary

to the performance of the job?" (Lawshe, 1975, p.567).

Finally, based on the acquired CVP evaluations, the researcher calculated the Content Validity Ratio CVR for each question by applying the following formula:

$$\text{CVR}=\frac{n_e - {}^{N}/_{2}}{{}^{N}/_{2}}$$

"In which the n_e is the number of panelists indicating 'essential' and *N* is the total number of panelists. The CVR is an item statistic that is useful in the rejection or retention of specific items" (Lawshe, 1975, p.567). Based on that formula, the value of CVR designated for each question (item) is determined in which higher CVR values signify higher validity for the question and vice versa. The values of CVR will always range between −1.0 and 1.0 where judgments on their validity merits are determined by comparing the CVR outcomes against the total number of panelists (refer to table 3.5). Table 3.5 shows the minimum value of CVR for an item to be accepted and retained. The outcomes of content validity procedures of this research are presented in appendixes 3-3, 3-4 & 3-5.

Table 3.5. Minimum Values of CVR (source. Lawshe, 1975, p.568)

No. of Panelists	Min. CVR Value
5	.99
6	.99
7	.99
8	.75
9	.78
10	**.62**
11	.59
12	.56
13	.54
14	.51
15	.49
20	.42
25	.37
30	.33
35	.31
40	.29

3.10.2 Pilot Testing

The second phase of the instrument validation process in this research was the pilot phase. Pilot studies are "preliminary test or trial run of an intervention, or of an evaluation activity such as an instrument or sampling procedure. The results of the pilot are used to improve

the program or evaluation procedure being piloted before it is used on a larger scale" (Thabane et al. 2010, p.2). De Vaus (1996) defines pilot study as "a test run of a set of questionnaire items to detect problems with the questions and questionnaire design" (p.392). Pilot studies are widely viewed as fundamental pre-requisite to main ones, and that piloted large-scale research has a better chance of success (Thabane et al. 2010). The main incentive for a researcher to conduct a pilot study is to evaluate viability of a large costly comprehensive research (ibid). Therefore, the benefits of a pilot study are not limited to enhancing data collection instruments (e.g. questionnaire), but goes beyond that to allow reviewing the analysis methods and assessing the theoretical framework (Bell, 2005). Moreover, pilot studies assist researchers by offering clearer picture of resources needed (time & budget) and best ways to increase the response rates (Thabane et al. 2010; Dillman, 2011).

As for the context of the research at hand, since the research targets older adults population in which many of whom may suffer reduced vision and other eyes diseases, piloting the research was particularly important in order to test the questionnaire in terms of type of question, font type and text size (Litwin, 1995). Data collection for the pilot study was conducted between the periods of 23rd August and 26th of October in 2015 where targeted population was reached by applying a combination of non-random sampling techniques: snowball and stratified sampling. When determining the sample size for a pilot, some issues of consideration included, such as the purpose of the pilot, size of the final study sample, survey design, resources and time (Saunders et al. 2009). However, as a general rule, responses between 100 and 200 are considered to be sufficient for a pilot study that intends to undertake a comprehensive item analysis (Johanson & Brooks, 2010). Therefore, this pilot study aimed to get around 200 valid responses. Accordingly, the researcher distributed 400 questionnaires (both hard & soft copies) to potential participants and received 278 responses back; 257 of which were complete and valid. The pilot phase is discussed in details in chapter 4 where more justifications and information on the techniques used are given.

3.10.3 Constructs Reliability

Having collected the data to be analysed, the next step of instrument validation is to determine constructs' reliability measurements. Reliability measures the internal consistency and stability of the constructs and their items, which were used in the questionnaires (Litwin, 1995). When a theoritical construct consists of more than one item, it is important to establish internal consistency reliability of that construct, indicating that its items measure various aspects of the same concept (ibid). Therefore, establishing internal consitency of the theoritical constructs used in this research is vital, since all of them are comprised of multiple items. To inofrm readers, reliability can be classified into four categories in which each reliability test has its unique use and applications (refer to table 3.6). As mentioned above, internal consistency is the form of reliability used in this research due to its aptness with measuring the reliability of multiple items for the same construct. Following are descriptions of the reliability measurments used.

Table 3.6. Classes of reliability (Trochim & Donnelly, 2008, p.87)

Reliability Class	Description
Inter-Rater or Inter-Observer Reliability	"Used to assess the degree to which different raters/observers give consistent estimates of the same phenomenon".
Test-Retest Reliability	"Used to assess the consistency of a measure from one time to another".
Parallel-Forms Reliability	"Used to assess the consistency of the results of two tests constructed in the same way from the same content domain".
Internal Consistency Reliability	"Used to assess the consistency of results across items within a test".

Cronbach's Alpha

Cronbach's alpha (*a*) is a widespread measurement utilised to determine the internal consistency of tests (Jupp, 2006). When a construct or a scale is internally consistent, it means that the different indicators of the same scale or construct complement each other when measuring the same concept (ibid). Cronbach's alpha is sometimes referred to as coefficient alpha, which is conveyed as a digit between 0 and 1 (Tavakol & Dennick, 2011). In general, an adequate reliability measure based on Cronbach's alpha is 0.70 or above (Wang & Strong, 1996). In terms of this study, Cronbach's alpha value for each of the theoretical constructs was determined using SmartPLS software package, and the results are demonstrated later on within this thesis.

Composite Reliability

Although Cronbach's alpha is one of the most frequently used assessment of internal consistency, there is a major criticism of it being a lower bound, and consequently undervaluing true internal consistency (Peterson & Kim, 2013). To prevent such situation, composite reliability is viewed to be a valid alternative (ibid). Although Cronbach's alpha and composite reliability are similar in terms of what they measure; however, it is claimed that composite reliability outperforms Cronbach's alpha with regards to the accuracy of estimating true reliability. The reason is that composite reliability permits variations of items loadings or weights, whereas the loadings or weights for Cronbach's alpha are restricted to being equal (Peterson & Kim, 2013). Thus, composite reliability will be applied in this study in order to guarantee better and more reliable results. In composite reliability, when results display outcomes of 0.7 and above, it is considered to be satisfactory (Henseler et al. 2009). Similar to Cronbach's alpha, SmartPLS software

package is used to determine composite reliability measurements.

3.10.4 Constructs Validity

The last step in the process of instrument validiation is to establish validity of theoretical constructs. Items of each construct are applied in research to measure certain things; thus it is essential to make sure that those items measure what they are meant to measure. For that reason, construct validity measurements are performed, which are convergent and discriminant validity (Vinzi et al. 2010).

Convergent Validity

Convergent validity is defined as "a set of indicators represents one and the same underlying construct, which can be demonstrated through their unidimensionality" (Henseler et al, 2009; p 299). In other words, convergent validity is intended to determine the extent to which the items of the same construct are correlated (Lowry & Gaskin, 2014). In a correlation matrix, when the items of the same construct are strongly correlated, then convergent validity is established. To determine adequate convergent validity, the ***Average Variance Extracted (AVE)*** can be used as a criterion (Henseler et al, 2009). AVE "reflects the overall amount of variance in the indicators accounted for by the latent construct. Higher variance extracted values occur when the indicators are truly representative of the latent construct" (Dean et al, 2008, p.179). A value of 0.5 for an AVE signifies satisfactory convergent validity, suggesting that a construct is able to describe more than 50% of the variance of its items on average (Fornell & Larcker, 1981).

Discriminant Validity

The second measurement used to establish constructs validity is the discriminant validity measurement. It reveals the extent to which a particular construct varies from other constructs. Therefore, in a correlation matrix, "one criterion for adequate discriminant validity is that a construct should share more variance with its measure than it shares with other constructs in the model" (Barclay et al., 1995 as cited in Dean et al, 2008, p.179). To determine discriminant validity, the square root of AVE of each construct should be greater than any of the cross correlation between the construct and other constructs within the model (Vinzi et al. 2010). Both measurements of convergent and discriminant validity are calculated automatically using SmartPLS software.

Factor Analysis

In addition to the previously mentioned construct validity measurements, there is another important examination applied to this research to further establish validity, which is called the factor loadings analysis (Vinzi et al. 2010). Each factor loading indicates the correlation between each item and its construct. The acceptable value for items' loadings is 0.707 or above (ibid). Furthermore, factor loadings analysis offers another way of looking at the

discriminant validity of a construct by examining the loading of a particular item aginst other loadings within the model. Each item should load to its construct greater than to its cross loadings, indicating that the item is actually intensely correlated to the construct it intends to reflect (Hair et al., 2011).

Having provided the methods used for instrument validation process; following is a discussion of the sample frame, methods and size used for pilot and final phase of this research.

3.11 Sampling Frame

The term 'sampling frame' is a reflection of the group of people or cases who had a chance to be chosen to partake in the survey, taking into account the sampling approach used (Fowler, 2002). Saunders et al. (2009) stated that "the sampling frame for any probability sample is a complete list of all the cases in the population from which your sample will be drawn". This means if the research for instance is focused on fast food restaurants in a local area, then the sampling frame would be all registered fast food restaurants in this area (ibid).

In terms of this research, as mentioned earlier in many instances that this research takes place in the Kingdom of Saudi Arabia. However, due to resource constraints, it was not possible to sample the entire population of Saudi Arabia; therefore, the City of Hail was selected as the research site in order to carry out a successful research, and to ensure that an in-depth perspective and understanding can be obtained. Further, since this research is an elderly-centric digital divide study, the sampling frame is older adults (50+) population of Hail city. For those unfamiliar with the term "sample", it reflects a subgroup of an entire population (Robson, 2002). In other words, a population sample is a group of people, cases or events sensibly chosen in various ways to represent that population (Cooper & Schindler, 2013). In summary, the sampling frame of this research is the older adults (50+) population of Hail city who had a chance to be selected whilst the research sample are those older adults individuals who were actually selected (refer to figure 3.8).

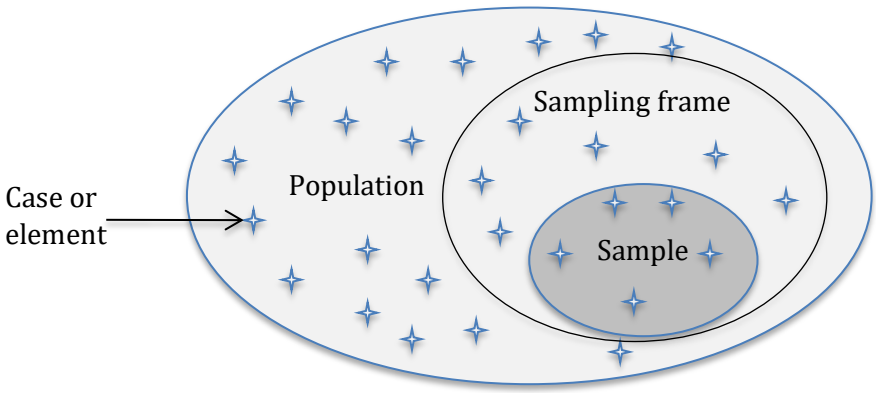


Figure 3.8. Sampling frame & research sample (source: Walliman, 2011)

3.12 Sample Size

A repeatedly asked question in most venues of research pertains to the number of participants, which makes a given sample 'adequately sized' (Barbra et al. 2016). While it is widely recognised that large samples typically relates to more accurate outcomes, it is also expected for the study to be resource consuming (e.g. time, cost) (ibid). Therefore, "in practice, the complexity of the competing factors of resources and accuracy means that the decision on sample tends to be based on experience and good judgment rather than relying on strict mathematical formula" (Hoinville et al, 1985; p 73). Accordingly, when determining the size of a sample, rather than strictly abide by statistical calculations, the available resources should first be taken into account (Dillman, 2007). The issue of findings' generalization also rises when discussing the size of a sample, as many scholars believe that generalization can only be made when the sample is large and adequately representative of the population (Denscombe, 2007). As for the research at hand, the sample size for the different phases of content validation, pilot and final research are given below.

Sample Size of Content Validation

As mentioned earlier in this chapter that the content validation process was derived from the work of Lawshe (1975) where he suggested a minimum of five panelists. As for this research, for more accurate results, the researcher decided to acquire double the number suggested by Lawshe (1975), so that the expert panel consisted of 10 members.

Sample Size of The Pilot

When determining the sample size for a pilot, some issues of consideration included, such as the purpose of the pilot, size of the final study sample, survey design, resources and time (Saunders et al. 2009). However, as a general rule, responses between 100 and 200 are considered to be sufficient for a pilot study that intends to undertake a comprehensive item analysis (Johanson & Brooks, 2010). Therefore, this pilot study aimed to get around 200 valid responses. Accordingly, the researcher distributed 400 questionnaires (both hard & soft copies) to potential participants and received 278 responses back; 257 of which were complete and valid.

Sample Size of The Final Phase

After an extensive literature review, the researcher concluded that the topic of the sample size for comprehensive studies is controversial and for each argument there a counter argument exists. Therefore, no sample is ever perfect; however, it must at least make sense when compared to the total population (Barbra et al. 2016). As a general rule, for a population of 1 million, 384 cases are viewed to be sufficiently representative of this population (Krejcie & Morgan, 1970; Saunders et al., 2009).

Further, looking at it from a different angle and based on mathematical calculations, Maxwell (2000) suggested that in behavioural research, the number of predictors should be taking into consideration when deciding on the sample size. For example, when the model consists of two predictor variables; a sample size of 141 is adequate whereas for nine predictors; a sample size of 1009 should be achieved (refer to table 3.7).

Table 3.7. Sample size based on the number of predictors

No. of Predictors	Sample Size
2	141
3	218
4	311
5	419
6	543
7	682
8	838
9	1,009
10	1,196

(Source: Maxwell (2000, p.454)

Accordingly, in terms of this research, although the initial target for the final sample size was set to be around 1000, the total number of completed valid questionnaires received from participants was only 937. However, this sample size was considered sufficient, relying on both of the above-mentioned approaches; the approach that is based on the subgroups being representative of the total population as well as the approach that is based on the number of predictor variables. Explanations of this as follows:

First, the total population of Hail city (the research site) is around 700,000 in which about 15% (sampling frame) of the total population fell into the category of older adults (50+) (Saudi General Authority for Statistics, 2016). Therefore, when applying the first criterion in which 384 participants are considered adequately representative of a total population of 1 million, 937 cases are definitely representative not only of the sampling frame (older adults) but also of the total population of Hail city.

Second, the total number of predictors used in this research is nine (refer to theoretical model in chapter 2). Accordingly, when applying the second criterion, the required sample size is 1009 cases (refer to table 3.7). Although the sample size for the final phase of this research did not reach that number, it was close enough to be considered satisfactory.

3.13 Sampling Design and Techniques

Having identified the sample size used throughout different stages within the research, this section sheds light on the available sampling techniques to be considered. The process of selecting sampling techniques is what a sample design is all about. A sample design is defined as "a definite plan determined before any data are actually collected for obtaining a sample from a given population. Thus, the plan to select 12 of a city's 200 drugstores in a certain way constitutes a sample design" (Kothari, 2004, p.15). As for sampling techniques, they are frequently categorised into probability samples or non-probability samples (ibid). The first technique pertains to the condition where each case within the sample frame has an identified probability of being part of the sample whereas for non-probability samples, this defined probability is not possible (Robson, 2002). Detailed explanations on both sampling techniques are provided in the following section. The sampling techniques used within different stages of this research are then identified and justified.

3.13.1 Probability Samples

Probability samples (or representative samples) are based on random selection methods in which the probability for each element or case in the sampling frame to be selected is equal (Donley & Grauerholz, 2012). Probability sampling can be conducted using various methods and techniques as follows:

Simple random sampling. It is the simplest demonstration of probability sampling methods. It is sometimes referred to as chance sampling because every element has the chance to be included (Kothari, 2004). This method is of most suitability when the entire population is represented in the sampling frame. However, it is widely criticised for being expensive and time consuming (Saunders et al. 2009).

Systematic random sampling. This method requires random selection of cases to be included in the sample. For example, selecting every 5th name on a list or every 20th car to enter the car park and so on. Although this method is systematic, the randomness element is obvious with picking up the commencing case (Kothari, 2004).

Stratified random sampling. This method is used when the sample is derived from inhomogeneous groups within the population. "In this technique, the population is stratified into a number of non-overlapping subpopulations or strata and sample items are selected from each stratum" (Kothari, 2004, p.16). The sample items are chosen randomly using the aforementioned simple random sampling.

Cluster random sampling. Similar to stratified sampling, cluster sampling requires dividing the population into subpopulations called clusters. This is then followed by randomly choosing the clusters to be sampled rather than cases or units. Lastly, the data is then gathered from the individual cases within the chosen clusters (Trochim & Donnelly, 2006).

Area random sampling. Area sampling usually pertains to studies conducted in a geographically large area (Kothari, 2004). This method can be viewed as being part of cluster sampling because it applies the same technique of creating 'clusters'. Using this method requires defining the total area from which 'smaller non-overlapping' subareas 'geographical clusters' are then drawn. Next step is then to randomly choose some of the pre-defined smaller subareas in which all cases within these subareas are included in the sample (ibid). Area sampling is advantageous and effective when there is no list available of the population in a large geographic area.

3.13.2 Non-Probability Samples

Non-probability samples (or judgemental samples) are mainly non-random selection methods of participants, reflecting inequality in the probabilities of being chosen (Donley & Grauerholz, 2012). These techniques are criticised for being less representative; however, they are advantageous in terms of cost, time and effort (ibid). They can be divided into the following:

Purposive Sampling. The selection of cases or participants is solely based upon the investigators' own judgment of whom they think are potentially suitable for the purpose of the research. This technique is suitable to be used with very small samples (e.g. case studies) (Saunders et al. 2009).

Snowball Sampling. Normally is used when facing difficulties with identifying the required cases within a population (Saunders et al. 2009). The first stage is to reach a few cases that meet the required characteristics identified in the research (Donley & Grauerholz, 2012). These cases are then employed as informants to recommend others who they think also meet the required characteristics. The main criticism of this technique is the likelihood of bias, given that participants recommend and identify each other, which might create a homogenous research sample (Lee, 1993).

Convenience sampling. From its name, this method is based on the convenience of the researcher and the participant. It simply reflects the non-random inclusion of participants who happen to be available (Saunders et al. 2009). This process is then sustained until the number of cases desired is met. Convenience sampling is the least desired non-probability sampling technique because of the extreme element of non-randomness it encompasses, which makes any findings non-generalisable to anything. Nonetheless, "knowledge can still be acquired and the social world can be better understood" (Donley & Grauerholz, 2012, p.95).

Quota sampling. Is classified as a non-random stratified sampling method that is generally applied for interview studies (Kothari, 2004). It starts with dividing the target population into subsets, then assign a specific quota for each subset based on solid calculations. Then each interviewer is allocated a specific quota from which they should collect data. Aggregating the data collected by all interviews constitutes the full research sample

(Saunders et al. 2009). This technique is typically useful when the target population is quite large.

Expert sampling. This technique is specifically useful when opinions and insights are sought from those who presumably are experienced and knowledgeable in the area of study (Etikan & Bala, 2017). Because the sample consists of a group of experts and specialists, it is considered a very good technique for acquiring confirmation of validity to other sampling methods (ibid). Since the selection of sample is based on the judgments of the researchers, Expert sampling is regarded as a subset of purposive sampling (Etikan et al. 2016).

3.13.3 Sampling Techniques Used in The Research

For content validity stage, a non-probability expert sampling was applied that resulted in 10 participants (refer to section 3.10.1 for more details on content validation process). This technique was particularly selected because it enables the researcher to establish the validity of content by sampling a group of experts and specialists who have knowledge on the research topic (Etikan & Bala, 2017).

As for the pilot phase, a non-probability snowball sampling was applied to collect the data at this phase. This sampling technique was selected because the researcher had had already established contacts with people who were also regarded as potential participants. Those contacts then assisted in recruiting more people to participate in the survey. As the first field surveying experience, the non-probability snowball sampling helped the researcher to collect the required data and to gain more experience and surveying skills, which were later used at the final phase. Snowball sampling is widely used when facing difficulties with identifying the required cases within a population (Saunders et al. 2009). In general, non-probability sampling techniques, including snowball sampling, are considered appropriate for pilot studies and when resources are limited (e.g. time & budget) (Donley & Grauerholz, 2012; ER, 2012).

As for the final phase, the researcher used a combination of probability sampling techniques: area random sampling and simple random sampling. Building upon the experience gained throughout the pilot phase, the researcher decided to apply simple random sampling through the use of area random sampling. This selection was made for the following reasons:

- Although the snowball sampling technique was effective in recruiting participants, it was very time consuming, which meant that it is impossible to recruit a large sample (around 1000) in the available time frame (around three months).

- Area sampling is advantageous and effective when there is no list available of the population in a large geographic area so that the sampling frame would be the list of identified subareas (clusters) (Saunders et al, 2009).

- The employment of probability sampling techniques increased the efficiency of the researcher by offering more flexible participants' recruitment process. Unlike snowball sampling, there was no need to make arrangements in advance to meet up with potential participants or to disseminate the questionnaire. In other words, the researcher was not restrained by time and location 'when and where'.
- Area random sampling is normally applied for geographically large area, which was the case for the research at hand (Kothari, 2004). Therefore, the use of this technique allowed appropriate coverage of the sub-areas (neighbourhoods) within Hail city.
- Simple random sampling was employed because it guarantees that every household within the created sub-areas of Hail city had the chance to be included (Kothari, 2004).

The first stage started with area random sampling, which can be viewed as being part of cluster sampling because it applies the same technique of creating 'clusters'. The application of this technique requires defining the total area from which 'smaller non-overlapping' subareas 'geographical clusters' are then drawn. Therefore, in terms of this study, the total area was defined as the entire city of Hail. The main smaller subareas (neighbourhoods) where then identified within Hail city based on already existing divisions that are being used by real estate agencies (see appendix 3-6). For the next step the researcher applied the simple random sampling technique in which households within those pre-defined subareas were randomly selected. Throughout this process, the researcher knocked at residents' houses and distributed the survey questionnaires to households' residents in Hail. The application of the aforementioned sampling methods resulted in distributing a total of 1656 questionnaires to households that led to 1147 replies. However, only 937 were valid and completed. Although 1000 completed responses were initially targeted, due to resources restrains in terms of time, budget and manpower, 937 valid responses were considered sufficient for the purpose of this research. Further, to ensure that all the participants had proper means of providing a response, participants had the chance to provide their answers in a face-to-face manner in which the researcher himself collected their answers, resulting in 176 cases. Alternatively, the other choice was to receive a hard copy of the questionnaire and the researcher collects it at a later time, resulting in 761 cases. Finally, as the study took place in Saudi Arabia, division between genders is an issue that was mitigated by having a female assistant (this was approved by the UOH ethics committee, refer to appendix 3-7) accompanying the researcher for a month when visiting participants at their houses in an attempt to increase the number of female participants.

Summary of Sampling Methods

Having explained in details the characteristics of the sampling design of this research, the following table 3.8 provides a summary of all related information in terms of sampling size, methods and frames used for data collection throughout different stages of the research.

Table 3.8. Research sampling methods, size and frames

Phase	Sampling Method	Target Sample Size	Actual Sample Size	Sampling Frame
Content Validity	Expert sampling	10	10	Saudi Arabia
Pilot Test	Snowball sampling	200	257	Hail city
Final Survey	Area & Simple random sampling	1000	937	Hail city

3.14 Summary of The Research Methodology

Having identified that this research mainly applies a quantitative approach for primary data collection and analysis, it is beneficial at this juncture to summarise the major strategic steps conducted in order to clarify the overall picture of this research methodology. These steps denote the phases the research has been through in which one phase led to the other. The research phases are summarised as follows:

Table 3.9. Outline of Research Methodology

Phase 1: Instrument Development & Pilot Testing
• Pilot questionnaire development through extensive literature review • Content Validity procedures • Data collection process resulted in 257 responses from older adults (50+) • Data analysis (both statistical & model analysis) • Provide findings • Final survey development
Phase 2: Final Survey
• Data collection process using area & simple random sampling resulted in 937 responses from older adults (50+) • Data analysis (both statistical & structural model analysis using SEM-PLS) • Constructs reliability and validity measurments • Provide final results
. **Phase 3: Evaluation**
• Determine how to collect data for evaluation • Semi-structured interviews with 10 participants • Participants' opinions against hypotheses testing results • Research influence on the behaviours and attitudes of the participants towards the MOI e-portal

3.15 Chapter Summary

This chapter commenced with highlighting the philosophical underpinnings of this research in terms of its ontological and epistemological standpoint. This was followed by a comparison of the terms 'methodology' and 'method' as well as differentiating between the two research inquiry types, deductive or inductive. Following sections were then dedicated to providing detailed information on time horizon and the various methods applied to this research in terms of data collection, data analysis procedures, sampling techniques, sampling size and other related research methods. This chapter also included all relevant information with regards to the research site as well as the investigated governmental e-portal were provided along with reasoning of their selection by the researcher. Next, procedures of instrument validation used in the research were discussed in details. The elements of instrument validation were discussed in terms of content validation, pilot testing, and constructs' reliability and validity measurements.

Chapter 4

Pilot Test & Final Survey Development

4.0 Introduction

This chapter sheds light on the various dimensions of the pilot study conducted as part of the fulfillment of efforts for the thesis. It begins with section 4.1 where identification of the aims of the pilot phase are provided. This is followed by descriptions of the pilot survey questionnaire development in section 4.2; ie. how the questionnaires were administered and handed to the participants. Thereafter, section 4.3 offers a brief description of the developed construct measures and the phrasing of the items and asked of the participants. The results of content validation procedures were then presented in section 4.4, followed by a presentation of the sampling approach applied to this phase in section 4.5. The pilot data analysis is then provided in section 4.6, including the demographics, reliability and validity measurments, structural model analysis and hypotheses testing. Towards the end of this chapter, lessons learned from the pilot phase will be summarised and presented in the last section.

4.1 The Pilot Study

As mentioned earlier in chapter 1 the literature of older adults and technology adoption, particularly the adoption of Internet and e-government lacks the context of developing countries and the Arab world, which has motivated this research. Accordingly, this research aimed to identify, explain and understand the adoption, use and diffusion of e-government services within the older adult population (50+) of a vicinity in Saudi Arabia. Further, in order to achieve this aim, a major data collection processes took place for the acquisition of the final quantitative datasets. However, in order for the final data collection process to be successful, it must be preceded by a substantial pilot study. Pilot studies are widely viewed as fundamental pre-requisite to main ones, and that piloted large-scale research has a better chance of success (Thabane et al. 2010). The main incentive for a researcher to conduct a pilot study is to evaluate the viability of a large costly comprehensive research (ibid). In light of this, the following are the main aims of the pilot phase of this thesis:

1. To test the data collection instrument (survey questionnaires), analysis methods and coding in order to establish their aptness for the final phase.
2. To assess the available resources (time, budget and manpower) and to gain experience to be used to increase the response rate.
3. To statistically test the proposed structural model in order to generate preliminary impression on the variability within older adults' intentions to use e-government

services (MOI e-Portal). Factors that strongly influence such intentions will also be identified.

4. To comparatively assess the demographic variables with regards to their association with older adults' intentions to use the MOI e-portal.

As stated above a survey questionnaire was the data collection instrument for both phases of this research (pilot & final). Therefore, the following section informs readers of how the survey questionnaire was developed.

4.2 Pilot Survey Questionnaire Development

With regards to the pilot survey, the first question the research team needed to answer is how the survey questionnaires are going to be disseminated. There are many ways and means for this to be achieved, including the paper-based questionnaires, face-to face questionnaires and Internet-based questionnaires. It was kept in mind though that each technique has its pros and cons. For example, Internet-based surveys are good approach for saving time, effort and other kind of researchers' resources (Wright, 2005). They are also of great help with overcoming the issue of geographic boundaries, allowing researchers to reach potential participants regardless of their physical location. On the other hand, online surveys can be difficult as challenges such as, sampling, validity, implementation and evaluation of data might cause problems that deteriorates the value of the research (ibid). Another example is the paper-based survey where there are advantages and disadvantages. In general, unlike online surveys, using paper-based surveys typically lead to accomplishing high response rates, which is a significant advantage (Duncan, 2008). However, this achievement normally comes at a high cost in terms of time and money (Hohwü et al. 2013). Therefore, after careful considerations of the pros and cons of the available surveying methods, the research team decided that for the pilot phase, the survey will be administered in three different ways to suit the requirements and desires of each individual participant (paper-based questionnaires, face-to face questionnaires and Internet-based questionnaires).

In essence, survey questionnaires were used to obtain desired information from an identified audience by seeking them to answer a standardised set of questions (Gratton & Jones, 2010). The employment of quantitative survey questionnaires as the key instrument for this research is pivotal in order to test the proposed conceptual framework and hypotheses. Survey questionnaires assist the researcher to obtain the raw data in the form of structured numbers, which make them easier to be organized, classified, and transformed into meaningful datasets in order to be statistically and analytically validated in the context of real life (ibid). However, such raw data can only be obtained when the suitable questions are being asked in the questionnaire. Therefore, this poses the question of how the questionnaire is built and how the questions are selected. Generally, there are three forms of data variables; namely, opinion, behaviour and attribute variables (Dillman, 2007). Behaviour variables capture what participants do, did, or will do whereas opinions variables capture the participants' feelings, beliefs and perceptions about something (ibid). Attribute

variables however are designed to record the variability among the participants' behaviours and opinions. They also indicate the extent to which the collected data is representative of the total population (Saunders et al. 2009). Examples of attribute questions include education level, gender, age and income. Therefore, in terms of this research and to gain the benefits of attributes variables, the questionnaire began with basic attributes questions (demographic questions), such as age, gender, education and health status. Further, to remind readers, this research seeks to discover what influences older adults' adoption of Internet & e-government services. Accordingly, the pilot questionnaire also contained behaviour questions pertaining to Internet usage patterns. The last set of questions fell into the opinion variables category, which were developed after an extensive review of IS and technology adoption literature. These opinion variables were directly related to the constructs of the theoretical model provided previously in chapter 2. The phrasing of questions were determined by either adopting already existing questions used previously by other researchers, or by adjusting them to suit the context of the current research (Saunders et al. 2009). Overall, the pilot questionnaire consisted of 44 questions, representing all types of variables (attributes, behaviours and opinions). The survey questionnaire is provided in appendix 4-1.

4.3 Development of Construct Measures

Literature offers many definitions and explanations of a construct measure; however, for the purpose of the research at hand, the following definition is adopted. Constructs are "conceptual or theoretical entities that are not directly observable and are the topics of research" (Levine & Kotowski, 2010, p.68). As mentioned above the constructs measures applied to this research were carefully chosen after an extensive review of IS and technology adoption literature where each construct is represented by many items that measure the construct. Based on the constructs, the study proposed eleven hypotheses, aiming to determine the cause and effect relationships between independent and dependent variables as well as the direction of such relationships (positive or negative). The wording of item questions were determined by either adopting already existing questions used previously in literature, or by adjusting them to suit the context of the current research (Saunders et al. 2009).

Further, given that the item questions are opinion variables, 'rating' questions were deemed appropriate as the type of their wording (ibid). Rating questions are usually associated with the Likert-style rating scale, which allows capturing the extent to which participants agree or disagree with a given statement, typically based on a rating scale of 4, 5, 6 or 7 points (ibid). As for this research, the 7 Likert-scale items questions related to the use of the MOI e-portal were used. The seven-point scale was selected because "it has been shown to reach the upper limits of the scale's reliability. As a general rule, Likert and others recommend that it is best to use as wide a scale as possible" (Allen & Seaman, 2007). Overall, the pilot questionnaire consisted of 51 items questions representing the 11 constructs that were used for the pilot study. The following table 4.1 provides an overall picture of the constructs

used and the number of items for each one. For full details on the items, please refer to appendix 2-2**.**

Table 4.1. Theoretical model constructs and number of items

Construct	Definition	Number of Items
Social influence	"The extent to which members of a social network influence one an other's behaviour"	**3**
Perceived cyber risk	"The citizen's subjective expectation of suffering a loss in pursuit of a desired outcome"	**4**
Perceived Website assistance	The perception that a website facilitates a user's activities and provide suitable support when needed	**11**
Compatibility	"The degree to which an innovation is perceived to be with the existing values, past experiences, and needs of potential adopters"	**4**
Relative Advantage	"The degree to which an innovation is seen as being superior to its predecessor"	**5**
Image	"The degree to which use of an innovation is perceived to enhance one's image or status in one's social system"	**5**
Complexity	"The degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand"	**5**
Behavioural Intentions	"The degree to which a person has formulated conscious plans to perform or perform some specified future behaviour"	**4**
Trust of the Internet	"The belief that needed structural conditions are present (e.g., in the Internet) to enhance the probability of achieving a successful outcome in an endeavour like e-commerce"	**3**
Trust of the government	"One's perceptions regarding the integrity and ability of the agency providing the service"	**4**
Disposition to trust	"The extent to which one displays a consistent tendency to be willing to depend on general others across a broad spectrum of situations and persons"	**4**

4.4 Content Validation

After developing the pilot survey questionnaire, the first stage of instrument validation for this research began with content validity. Content validity is meant to determine the relevance and representativeness of the questions in the way that they measure what they are meant to measure (Yaghmaie, 2003). As explained in chapter 3, this research adopted the method of expert panel in which a group of individuals with some knowledge about the research topic were asked to assess the survey questions based on three assessment choices: "essential, useful but not essential or not necessary" (Lawshe, 1975). The panel also offer suggestions for improvements in terms of the survey completion duration, clarity of layout and instructions, questionnaire attractiveness and any other comments they believe are worth mentioning (Bell, 2005).

The expert panel for this research consisted of ten members; eight of which were academic affiliates whereas the other two reviewers were older adults citizens (50+) (refer to table 4.2). The academic affiliates assessment was sought because of their knowledge and experience with regards to research development in general. As for the two older adults, their participation to the panel was sought because this research is elderly-centric; therefore of high relevance to them. Further, based on the acquired panel's assessment, the researcher calculated the Content Validity Ratio CVR for each question by applying the following formula:

$$\text{CVR}=\frac{n_e - N/2}{N/2}$$

"The n_e is the number of panellists indicating 'essential' and *N* is the total number of panellists. The CVR is an item statistic that is useful in the rejection or retention of specific items" (Lawshe, 1975, p.567). Accordingly, all of the survey questions met the requirements to be accepted except for three questions, which were regarded irrelevant to the purpose of the research (see appendix 3-3 & 3-4). Those three questions are:

(1) Who is the network provider of your tablet(s) device?

(2) How do you pay for your tablet device?

(3) Where do you get information regarding the use of your tablet device?

However, although the panel rejected some questions, the research team decided to keep them because the rejection was not based on theoretical and/or ethical reasons. Those questions might not be directly related to the main topic of the study, but they are believed to provide statistical benefits when analysed in this research or in a separate future study.

Table 4.2. Content Validation - Expert Panel

Reviewer	Discipline
A	PhD/MIS
B	PhD/MIS
C	PhD/MIS
D	PhD/MIS
E	PhD/Computer Science
F	Masters/MIS
G	Masters/Management
H	Masters/ Computer Science
I	Older adult citizen
J	Older adult citizen

4.5 Pilot Sampling Design

Since this research is an elderly-centric digital divide study, the sampling frame was older adults (50+) population of Hail city. The data collection processes took place between the periods of 23th August and 26th of October in 2015. A non-probability snowball sampling was applied to collect the data at this phase (refer to section 3.11.3 in chapter 3 for justifications). The principal researcher started gathering the data using already established contacts in Hail city who also assisted in recruiting more people to participate in the survey. This process eventually led to the distribution of 400 paper-based questionnaires as well as Internet-based questionnaires (SurveyMonkey link). The total number of questionnaires received back was 278. 21 of the replies were discarded because of their incompleteness and not providing replies to many unanswered questions. Accordingly, the total number of valid and completed responses to be analysed was 257.

4.6 Pilot Analysis

Having explained in the previous sections of this chapter of the instrument development, content validation and sampling design, the following sections will now offer insights into the analysis and findings of the pilot data.

4.6.1 Demographics

It was predicted before commencing this project that males will outnumber the females in the sample because of the cultural and traditional norms of the Saudi society and the division between genders. This difference in size might undermine the fulfilment of the research aim where both genders are included to be examined. Therefore, to ensure that there was equal and accurate representation of the genders despite these differences, and to avoid any possible nonresponse bias, this research applied the corrective weighting approach to the gender variables using SPSS v23 (Politz & Simmons, 1949; Lahaut et al. 2002; Berg, 2005). The application of the corrective weighting approach ensured that the participants' numbers for both genders are balanced (Politz & Simmons, 1949). For readers' information, nonresponse bias refers to "the mistake one expects to make in estimating a population characteristic based on a sample of survey data in which, due to non-response, certain types of survey respondents are under-represented" (Berg, 2005, p.3).

The following table 4.3 presents a general data overview without any changes to gender weights to offer the original picture. The socio-demographic summary table below shows that the majority of participants were males with 185 cases (72%) whereas the females made only 28% with 72 cases. As for age, older adults within the age band 60-69 were the largest group with 106 cases (41.2%), followed by the group of 50-59 with 75 cases (29.2%). Further, there were 54 cases for the group aged 70-79 (21%), 17 cases for the group aged 80-89 (6.6%), and finally the least age group fell into the 'over 90' category with only 5 cases (1.9%). In addition, in terms of education, holders of a secondary school certificate made up to 17.9% with 46 cases, 41 participants held a 1st degree (BA / BSc),

and 19 were illiterate (7.4%). More non-weighted demographic details are available in appendix 4-2.

Table 4.3. Socio-demographic Summary (n=257)

	Intervals	Frequency	Percentage
Age	50-59	75	29.2%
	60-69	106	41.2%
	70-79	54	21%
	80-89	17	6.6%
	Over 90	5	1.9%
	Total	257	100%
Gender	Male	185	72%
	Female	72	28%
	Total	257	100%
Education	Higher Degree/Postgraduate	13	5.1%
	1st Degree (BA / BSc)	41	16%
	College Diploma	39	15.2%
	Technical Certificate	23	8.9%
	Secondary School Certificate	46	17.9%
	Primary School Certificate	43	16.7%
	Can Read and Write Arabic	33	12.8%
	Illiterate	19	7.4%
	Total	257	100%

4.6.1.1 Demographics (Age, Gender & Education) & Internet Adoption

Literature has highlighted various variables, including age, gender, education, employment, and health being key socio-demographic variables (Burgess, 1986). Therefore, as mentioned earlier in the research questions of chapter 1, this study will examine some demographic variables in order to determine their impact on Internet adoption. Although it is an e-government adoption study, this study attempts to understand the importance of demographic variables that influence Internet adoption, given the fact that "one of the primary vehicles governments are building to provide services are Internet 'portals' that offer citizens a single, easy access point to services" (Howard, 2001. P.7). Further, the importance of such variables is that they offer significant information about the characteristics of the population under study.

Age

The table 4.4 below is a statistical presentation of the age variables against Internet adoption status. It shows that participants within the age band 50-59 were foremost with 97.2% comprised of 73 cases, only one case within the same age group was a non-adopter, and another case that had a plan to become adopter. Further, 90 participants within the age

band 60-69 were adopters (88.5%) and 12 were non-adopters (11.5 %). As for the age group 70-79, 38.7% of the participants were adopters with 22 cases and 61.3% were non-adopters with 35 cases. Additionally, participants within the age group 80-89 showed a high tendency not to adopt the Internet with 16 cases (92%), and 1 case only of Internet adoption (8%). Finally, all of the 6 cases of the participants aged over 90 were non-adopters with no future plans to adopt the Internet. Accordingly, it can be inferred that age is an important influential element with regards to Internet adoption among older adults as the above results showed a clear decrease in the likelihood of Internet adoption as age increases.

Table 4.4. Age & Internet Adoption (Gender-Weighted, n=257)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Age	50-59	73	97.2	1	0.9	1	1.9	75	29.2
	60-69	90	88.5	12	11.5	0	0	102	39.7
	70-79	22	38.7	35	61.3	0	0	57	22.2
	80-89	1	8	16	92	0	0	17	6.7
	Over 90	0	0	6	100	0	0	6	2.2
	Total	187	72.6	69	26.8	1	0.5	257	100

Gender

In terms of gender composition, table 4.5 depicts that the number of male Internet-adopters was 103, which comprised 80% of the overall male respondents. Comparatively, the female Internet-adopters comprised 65.3% of the overall female participants with 84 cases. The only case that revealed plans to become an Internet-adopter fell into the male category. Although the gender-weighting technique was applied to establish a balance between the genders due to a low participation level within the females population, the above results implies a larger Internet diffusion within males older adults than the females older adults.

Table 4.5. Gender & Internet Adoption (Gender-Weighted, n=257)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Gender	Male	103	80	24	18.9	1	1.1	128	50
	Female	84	65.3	45	34.7	0	0	129	50
	Total	187	72.6	69	26.8	1	0.5	257	100

Education

When considering the education level in relation to Internet adoption status, all participants with higher degrees were adopters with 11 cases (100%). The total number of 1st Degree holders was 34 with 32 (93.9%) cases of adoption; 1 case of non-adoption; and another case with plans to become an adopter. College diploma holders were 41 participants; 98.3% of which were adopters and 1.7% were non-adopters. Further, as for technical certificate holders, the participants within this group are Internet-adopters with 17 cases. As for the holders of a secondary school certificate, which made up the largest number within the education category with a total of 47 cases, there were 42 adopters (89.5%), and 5 (10.5%) non-adopters who did not plan to become ones. The adopters within the holders of a primary school certificate were 37 (79.4%) while the non-adopters were 10 participants (20.6%). Respondents who could only read and write (with no official educational certifications) were Internet-adopters by 17.6% with 6 cases only, and non-adopters by 82.4% with 30 cases. Finally, there was one adopter only (2.9%) within the illiterate group and the rest were non-adopters of Internet with 23 cases (97.1%). In general, these results indicate that the higher education level of an older adult, the more likelihood of him/her to adopt the Internet (see table 4.6).

Table 4.6. Education & Internet Adoption (Gender-Weighted, n=257)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Education	Higher Degree/ Postgraduate	11	100	0	0	0	0	11	4.4
	1st Degree	32	93.9	1	2	1	4.1	34	13.2
	College Diploma	41	98.3	1	1.7	0	0	41	16.1
	Technical Certificate	17	100	0	0	0	0	17	6.6
	Secondary School Certificate	42	89.5	5	10.5	0	0	47	18.4
	Primary School Certificate	37	79.4	10	20.6	0	0	46	18
	Can Read and Write Arabic	6	17.6	30	82.4	0	0	36	14
	Illiterate	1	2.9	23	97.1	0	0	24	9.4
	Total	187	72.6	69	26.8	1	0.5	257	100

Employment

As for employment status and Internet adoption, part time employees were the highest with 100% Internet adoption level. The retired participants (under 65 years old) came second with 98.2% adoption level; followed by the full time employed participants with 96.1% adoption rate. As for participants who were self-employed, owned their own businesses, and pensioners above 65 years old, rates of Internet adoption were, 89.2%, 87.9%, and 84.5% respectively. However, these relatively high levels dropped drastically with unemployed participants. The group of unemployed participants (for medical reasons) showed 35.9% level of Internet adoption, and the group of unemployed participants (for more than 6 months) showed a level of 36.2% only (see table 4.7). From the above results, it can be clearly seen that the level of Internet adoption reduced when considering unemployed participants.

Table 4.7. Employment & Internet Adoption (Gender-Weighted, n=257)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Employment Status	Pensioner 65+	30	84.5	6	15.5	0	0	36	14
	Retired (under 65)	38	98.2	1	1.8	0	0	38	14.9
	Employed full time	51	96.1	1	1.3	1	2.6	53	20.6
	Employed part time	9	100	0	0	0	0	9	3.7
	Self-employed	15	89.2	2	10.8	0	0	17	6.4
	Own my own business	10	87.9	1	12.1	0	0	12	4.5
	Unemployed (for medical reasons)	3	35.9	5	64.1	0	0	8	3
	Unemployed (6+ months)	31	36.2	54	63.8	0	0	84	32.8
	Total	187	72.6	69	26.8	1	0.5	257	100

Occupation

In terms of occupation (current or former), the greatest level of Internet adoption fell into the category of 'services/sales' with 100%; followed by the group of "academic/teacher" with 98.2%. On the other hand, participants within the category of 'housewife' depicted the lowest level of Internet adoption with 34.4% only. Finally, the single case of a participant who has had plans to become an Internet adopter fell into the category of 'legislator/manager', comprising only 15.9% within that category (see table 4.8).

Table 4.8. Occupation & Internet Adoption (Gender-Weighted, n=257)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Occupation	Academic/ Teacher	39	98.2	1	1.8	0	0	39	15.3
	Agricultural	11	59.6	7	40.4	0	0	18	7.1
	Public Sector Employee	49	94.6	3	5.4	0	0	52	20.1
	Craft/Trade	15	56.9	12	43.1	0	0	27	10.4
	Freelance	15	68.2	7	31.8	0	0	22	8.6
	Legislator/ Manager	7	84.1	0	0	1	15.9	9	3.4
	Plant/ Machine Operator	3	83.3	1	16.7	0	0	4	1.6
	Services/ Sales	17	100	0	0	0	0	17	6.7
	Officer	10	88.2	1	11.8	0	0	12	4.6
	Housewife	20	34.4	37	65.6	0	0	57	22.2
	Total	187	72.6	69	26.8	1	0.5	257	100

Health

The respondents were to choose from three health status groups; excellent, good or poor. Table 4.9 shows that the majority of respondents fell into the group of 'good' with 126 cases comprising 49.2% of the overall responses. For the same health group, 107 (84.5%) participants were Internet adopters, 30 (38%) participants from the group of 'poor' health status were adopters, and finally 50 (96%) participants from the 'excellent' group were adopters. The only case of a participant planning to become Internet adopters belonged to the group of 'excellent' health status comprising 2.7% only within the group. In conclusion, it can be clearly seen that there is a strong association between the participants' health status and Internet adoption, in which the better the health, the greater the likelihood of Internet adoption and vise versa.

Table 4.9. Health Status & Internet Adoption (Gender-Weighted, n=257)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Health Status	Excellent	50	96	1	1.3	1	2.7	52	20.3
	Good	107	84.5	20	15.5	0	0	126	49.2
	Poor	30	38	49	62	0	0	79	30.6
	Total	187	72.6	69	26.8	1	0.5	257	100

4.6.2 Descriptive Statistics

Having presented the analysis of the key components of demographic variables and their association with Internet adoption status, it is appropriate at this stage to highlight some of the key descriptive statistics of the same dataset. Descriptive statistics are meant to provide quantified demonstrations that enable researchers to make comparisons of the 'parametric numerical data' (Walliman, 2011). By the application of descriptive statistics, raw data can be processed to produce certain indices of interest (Kothari, 2004). Generally, these statistics concentrate on two characteristics within data: the central tendency as well as the dispersion (Saunders et al. 2009). Central tendency "is one number that denotes various 'averages' of the values for a variable" (Walliman, 2011, p.117). To measure central tendency, researchers typically use one of three methods: the mean, which basically denotes the average value, or the median, which refers to the middle value between the maximum and minimum value, or the mode, which indicates the value of most frequent occurrence (ibid). After defining the central tendency for a given variable, it is significant to provide the dispersion statistics by outlining 'how the data values are dispersed around the central tendency'. One of the leading and widely used dispersion measure is standard deviation. It is defined as a "statistic that describes the extent of spread of data values around the mean for a variable containing numerical data" (Saunders et al. 2009, p.601).

In terms of this research, for descriptive statistics, Mean will be used to measure central tendency whereas for dispersion, standard deviation is applied. The two measures where selected because they are proven to be effective for descriptive statistics of numeric datasets, and that they are the most frequently used methods among researchers (Kothari, 2004; Saunders et al. 2009).

The table 4.10 below shows the mean (μ) and standard deviation (σ) values for all of the construct measures used in the research. Interpretations of some of the values are next explained to provide the readers with an idea of the meanings behind the values. For instance, the mean value for the construct UI was 4.28, which means that on average the respondents showed relatively positive tendency with regards to behavioural intentions to use the MOI e-portal. On the contrary, the mean value for IM was only 2.05, implying that

the majority of respondents disagreed with IM related questions. Table 4.10 also exhibits the values of standard deviation, which are indications of the variation extent among the collective answers of the respondents whereby greater values imply greater diversity and wider differences between the answers given by respondents.

Table 4.10. Descriptive Statistics. Pilot Construct Measurements

Construct	μ	σ
Social (primary) Influence (PI)	4.08	2.49
Perceived Cyber Risk (PCR)	3.19	1.95
Perceived Website Assistance (PWA)	4.18	2.09
Compatibility (COM)	3.74	2.23
Relative Advantage (RA)	3.91	2.36
Image (IM)	2.05	2.21
Complexity (COMP)	3.08	1.78
Trust of Internet (TOI)	3.78	2.03
Trust of Government (TOG)	4.2	2.16
Disposition To Trust (DTT)	4.23	1.91
Use Intention (UI)	4.28	1.49
*All measures are based on Likert Scale (1 = Strongly Disagree, 7 = Strongly agree)		

4.6.3 Construct Measurement Reliability

Having provided descriptive analysis for the pilot data, this section will be dedicated to the establishment of construct measurement reliability. These measurments were identified and justified earlier in chapter 3. Reliability measures the internal consistency and stability of the constructs and their items, which were used in the questionnaires (Litwin, 1995). When a theoritical construct consists of more than one item, it is important to establish internal consistency reliability of that construct, indicating that its items measure various aspects of the same concept (ibid). To remind readers, in order to determine reliability, Cronbach's alpha and Composite Reliability will be calculated. First, for *Cronbach's alpha* measure, table 4.11 depicts that all of the constructs' measurements utilised for this research study are over 0.7; thereby, meeting the Cronbach's alpha criterion (Wang & Strong, 1996). From this, the outcome suggests that the questionniare applied in this study is internally consistent. Second, *composite reliability* values depicted in table 4.11 indicate that all of the constructs are reliable under this criterion because they are all above the required threshold, which is 0.7 (Henseler et al. 2009).

Table 4.11. AVE, Composite Reliability & Cronbach's Alpah

Construct	Cronbach's Alpha	Composite Reliability	AVE
Complexity (COMP)	0.979	0.983	0.923
Compatibility (COM)	0.971	0.979	0.922
Disposition To Trust (DTT)	0.920	0.944	0.809
Image (IM)	0.749	0.851	0.699
Perceived Cyber Risk (PCR)	0.981	0.986	0.948
Primary Influence (PI)	0.993	0.995	0.986
Perceived Website Assistance (PWA)	0.982	0.984	0.850
Relative Advantage (RA)	0.974	0.980	0.908
Trust of the Government (TOG)	0.959	0.970	0.892
Trust of the Internet (TOI)	0.974	0.983	0.950
Use Intentions (UI)	0.989	0.992	0.969

4.6.4 Construct Validation

Construct validity measurements are performed to make sure that items of each construct within the theoretical model measure what they are designed to measure (Vinzi et al. 2010). In terms of this research, the measurments used for that purpose are convergent and discriminant validity (ibid). First, to determine adequate *convergent validity*, the average variance extracted (AVE) can be used as a criterion. A value of 0.5 or above for an AVE signifies satisfactory convergent validity, suggesting that a construct is able to describe more than 50% of the variance of its items on average (Henseler et al, 2009). From the table above, the convergent validity for all of the constructs is higher than 0.5 which is suffecient. Second, to determine *discriminant validity*, the square root of AVE for each construct should be greater than any of the cross correlation between the construct and other constructs within the model (Vinzi et al. 2010). This reveals the extent to which a particular construct varies from other constructs. The table 4.12 below shows that discriminant validity criteria are met in all of the cases except for four cases. PWA is cross correlated with RA, UI & COM higher than the square root of AVE. RA is also cross correlated with COM greater than the square root of AVE. Therefore, in an attempt to tackle such weak outcomes for some constructs, the researcher will reconsider some of the questions have been posed to the participants along with the phrasing of those questions. For the final phase, the researcher will ensure that the questions related to the weak constructs will be written in a much clearer manner and with clearer explanations of supposedly vague questions. Details on the enhancement measures taken are provided later within this chapter (see section 4.7 Lesson Learned**)**. In addition to that, the final phase

study aims to obtain 1000 responses, which theoretically means that the analysis results will be nearer to the truth.

Table 4.12. Construct Cross-Correlation Matrix and AVE analysis - Diagonal numbers (in parentheses) are the square root of the AVE

	COMP	Com	DTT	IM	PCR	PI	PWA	RA	TOG	TOI	UI
COMP	(0.961)	0	0	0	0	0	0	0	0	0	0
Com	0.9433	(0.9602)	0	0	0	0	0	0	0	0	0
DTT	0.4317	0.465	(0.899)	0	0	0	0	0	0	0	0
IM	0.0772	0.068	-0.1406	(0.836)	0	0	0	0	0	0	0
PCR	-0.5581	-0.5842	-0.3916	-0.1904	(0.973)	0	0	0	0	0	0
PI	0.7481	0.7674	0.3626	-0.0442	-0.4558	(0.993)	0	0	0	0	0
PWA	0.9245	**0.9333**	0.4937	0.0871	-0.5914	0.7825	(0.922)	0	0	0	0
RA	0.9483	**0.9618**	0.4759	0.0809	-0.5729	0.7771	**0.9514**	(0.953)	0	0	0
TOG	0.5031	0.544	0.6391	-0.1265	-0.395	0.4764	0.5486	0.5332	(0.944)	0	0
TOI	0.7991	0.8093	0.5754	0.0727	-0.6389	0.6595	0.857	0.8442	0.5897	(0.975)	0
UI	0.917	0.9282	0.5121	0.0649	-0.584	0.7625	**0.9327**	0.9382	0.5702	0.8743	(0.984)

4.6.5 Structural Model Analysis

As mentioned in chapter 3, the model will be estimated using SmartPLS software package v.3.2.7, which applies the analysing technique of Partial Least Squares based Structural Equation Modeling (PLS-SEM). For that, a basic path analysis of the model was carried out (refer to figure 4.1). A path analysis assists in determining the effect of the explanatory variables on the dependent variables. The values between the explanatory variables and the dependent variables are the path coefficients where indications of significance are offered (Hair et al. 2011). In addition to path analysis, bootstrapping analysis was also run (refer to figure 4.2). Bootstrapping offers more reliable assessments of the path coefficients' significance by using the available data as a distribution in order to compute sampling errors and produce t-values (ibid). Significance was based on the rules of thumb for structural model evaluation, "Critical *t*-values are 1.65 (significance level = 10 percent), 1.96 (significance level = 5 percent), and 2.58 (significance level = 1 percent)" (Hair et al. 2011, p.145).

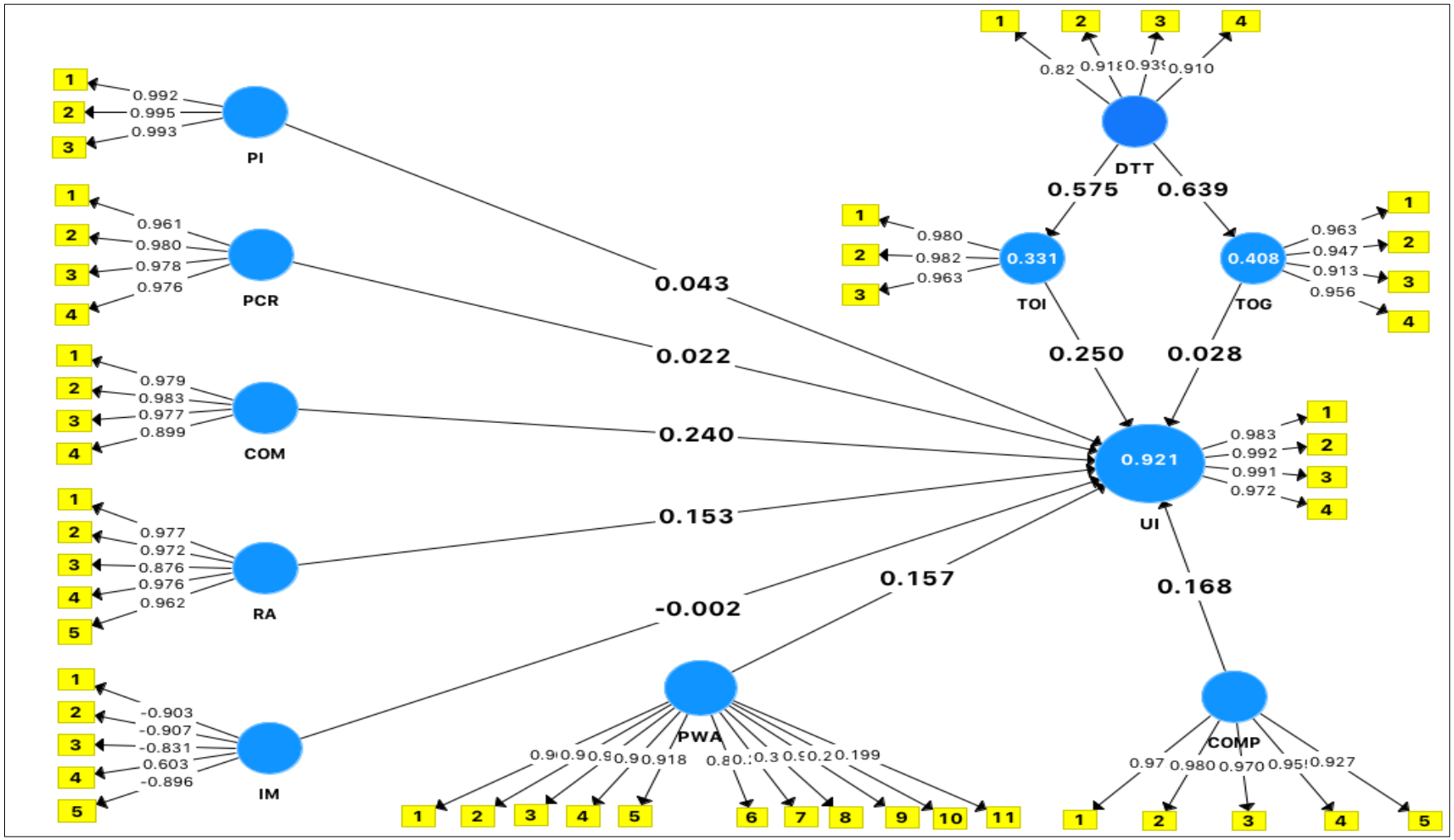


Figure 4.1. Basic pilot path analysis

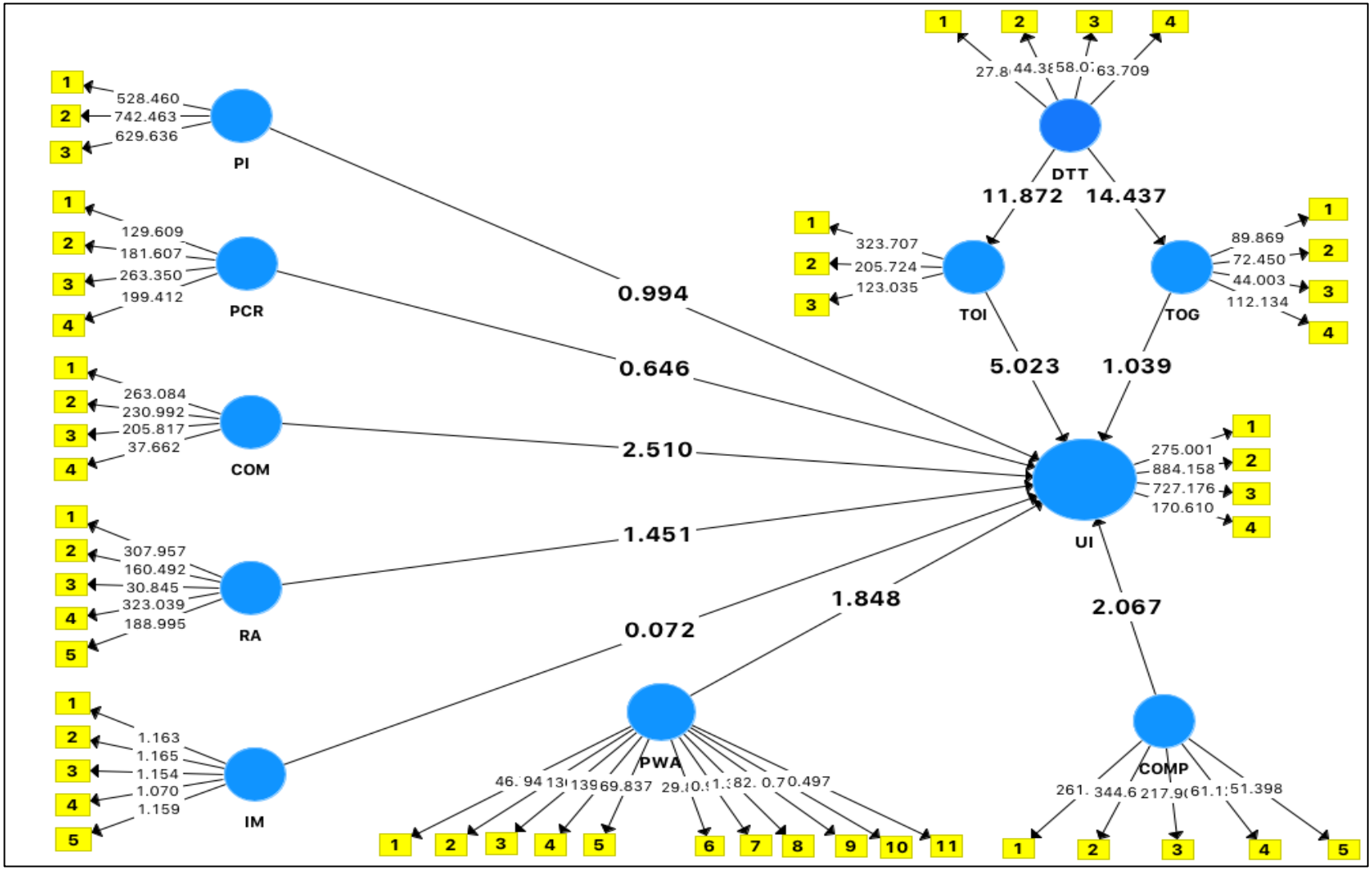


Figure 4.2. Bootstrap analysis of the pilot model

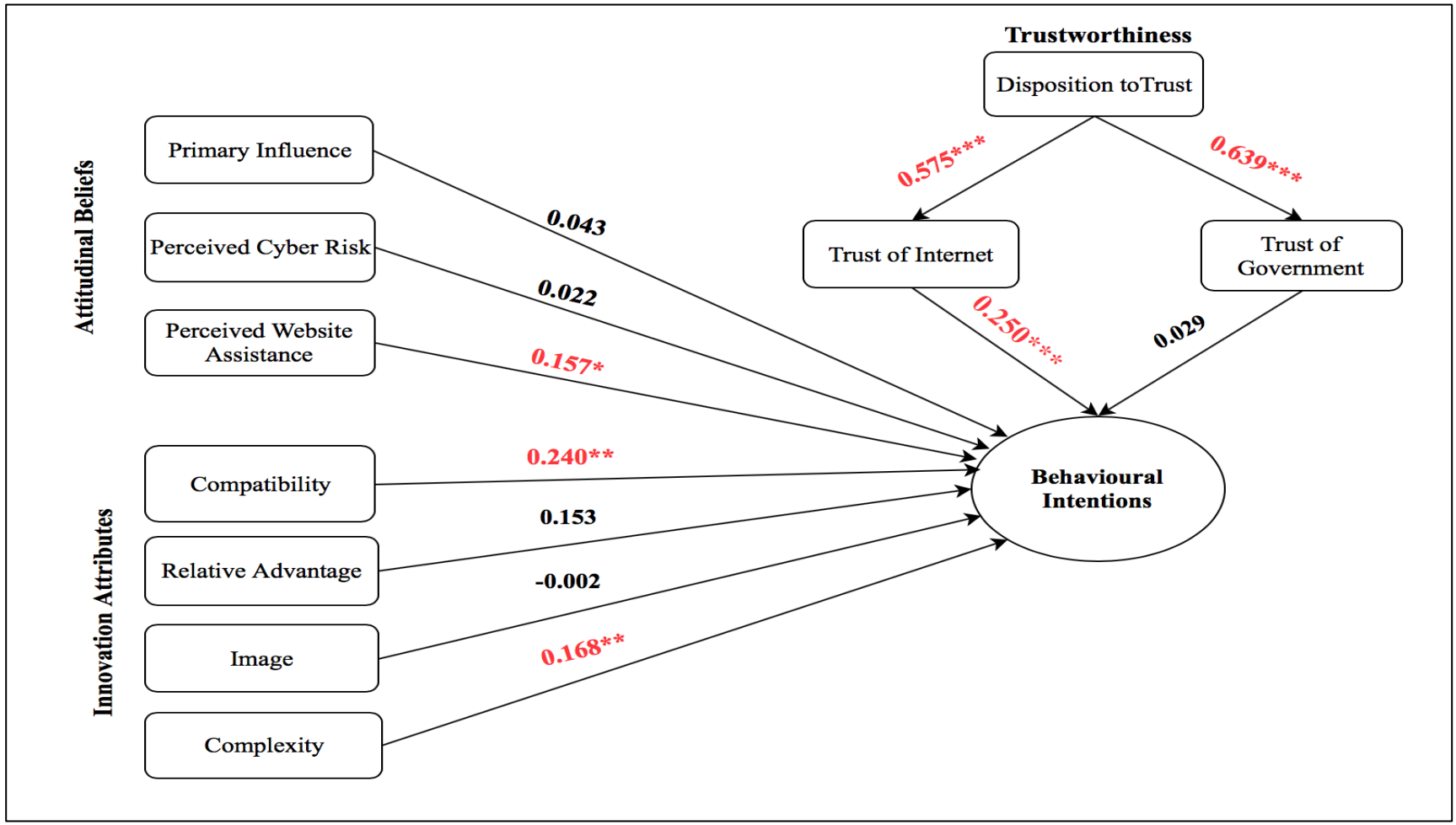


Figure 4.3. Structural pilot model evaluation

*Significant at 0.1 level
**Significant at 0.05 level
***Significant at 0.01 level

4.6.6 Hypotheses Testing

Testing a hypothesis is a statistical process applied to a sample data in order to determine whether or not the proposed perception about the targeted population is true (Gravetter & Wallnau, 2009). In chapter 2, 11 hypotheses were proposed and illustrated. Based on the previous model estimation results, next are provided the interpretations of those hypotheses in terms of whether they were accepted or rejected by analysis.

Hypothesis 1 predicted that social influence would positively relate to older adults' intentions to use the MOI e-Portal. This hypothesis however was not supported by analysis (*t*-value **0.994**).

Hypothesis 2 predicted that perceived cyber risk would negatively relate to older adults' intentions to use the MOI e-Portal. This hypothesis also showed no statistical significance (*t*-value **0.646**).

Hypothesis 3 predicted that perceived website assistance will positively relate to older adults' intentions toward using The MOI e-Portal. This hypothesis was supported by analysis (significant at 0.05 level), indicating more probability for an older adult to use The MOI e-Portal when he/she perceives a more reliable website assistance (*t*-value **1.848**).

Hypothesis 4 predicted that greater levels of perceived compatibility would positively relate to older adults' intentions to use The MOI e-Portal. This hypothesis was also supported by analysis (significant at 0.05 level), indicating the existence of a positive association between compatibility and behavioural intention to use The MOI e-Portal (*t*-value **2.510**).

Hypothesis 5 predicted that greater levels of perceived relative advantage would positively relate to older adults' intentions to use The MOI e-Portal. This hypothesis showed no statistical significance (*t*-value **1.451)**.

Hypothesis 6 predicted that lower levels of perceived complexity (or higher ease of use) would positively relate to older adults' intentions to use The MOI e-Portal. This proposition was supported by analysis (significant at 0.05 level), meaning that the less complex the website, the more likelihood for older adults to adopt The MOI e-Portal (*t*-value **2.067**).

Hypothesis 7 predicted that greater levels of perceived image would positively relate to older adults' intentions to use The MOI e-Portal. This hypothesis showed no statistical significance (*t*-value **0.942).**

Hypothesis 8 predicted that trust of the Internet would positively relate to older adults' intentions to use The MOI e-Portal. This proposition was supported by analysis (significant at 0.01 level), indicating that when trust of Internet increases, the likelihood to use The MOI e-Portal by older adults increases too (*t*-value **5.023**).

Hypothesis 9 predicted that trust of the government would positively relate to older adults' intentions to use The MOI e-Portal. This hypothesis however showed no statistical significance (*t*-value **1.039**).

Hypothesis 10 predicted that disposition to trust would positively relate to older adults' trust of the Internet. This proposition was supported by analysis (significant at 0.01 level), implying that the more disposition to trust of an older adult, the more trust they would have in the Internet (*t*-value **11.872).**

Hypothesis 11 predicted that disposition to trust would positively relate to older adults' trust of the government. This proposition was supported by analysis (significant at 0.01 level), implying that the more disposition to trust of an older adult, the more trust they would have in the government (*t*-value **14.437**).

Finally, although some hypotheses were not supported by analysis, they will be included in the final phase to be analysed again. For the final phase, the sample size will be much larger and therefore, there will be sufficient evidence to reasonably evaluate the validity of hypotheses. For readers' information, some sub-groups model analysis was conducted and presented in appendix 4-2.

The following table 4.13 summarises the final findings with regards to pilot hypotheses testing.

Table 4.13. Summary of the pilot hypotheses test results

Constructs		Path Coef. (β)	*t*-value	Significance (*p*-value)	Support
Predictor Variable	**Dependent Variable**				
Primary Influence (PI)	Use Intentions (UI)	**0.043**	**0.994**	**0.321**	**No**
Perceived Cyber Risk (PCR)	Use Intentions (UI)	**0.022**	**0.646**	**0.518**	**No**
Perceived Website Assistance (PWA)	Use Intentions (UI)	**0.157**	**1.848**	**0.065*+**	**Yes**
Compatibility (COM)	Use Intentions (UI)	**0.240**	**2.510**	**0.012**+**	**Yes**
Relative Advantage (RA)	Use Intentions (UI)	**0.153**	**1.451**	**0.147**	**No**
Image (IM)	Use Intentions (UI)	**-0.002**	**0.072**	**0.942**	**No**
Complexity (COMP)	Use Intentions (UI)	**0.168**	**2.067**	**0.039**+**	**Yes**
Trust of the Internet (TOI)	Use Intentions (UI)	**0.250**	**5.023**	**0.000***+**	**Yes**
Trust of the Government (TOG)	Use Intentions (UI)	**0.029**	**1.039**	**0.299**	**No**
Disposition To Trust (DTT)	Trust of the Internet (TOI)	**0.575**	**11.872**	**0.000***+**	**Yes**
	Trust of the Government (TOG)	**0.639**	**14.437**	**0.000***+**	**Yes**

$R^2 = 0.921$

P* <0.1 P** <0.05 P*** <0.01
+ Positive effect
- Negative effect

4.7 Lesson Learned From The Pilot Study

Throughout the course of the pilot phase, the research team learned many lessons related to many aspects of the research, including analysis, sampling and questionnaire design. Accordingly, corrective steps were taken in order to enhance the processes of the final data collection and analysis. The following sections provide descriptions of the main enhancements made to the final phase procedures.

4.7.1 Unsatisfactory Validity Measurements

After the employment of reliability and validity measurements, all the variables depicted satisfactory outcomes except for the following cases:

For discriminant validity measures, Perceived Website Assistance (PWA) is cross correlated with Relative Advantage (RA), Use Intentions (UI) & Compatibility (COM)

higher than the square root of AVE. RA is also cross correlated with COM greater than the square root of AVE (refer to table 4.12). Discriminant validity reveals the extent to which a particular construct varies from other constructs; however, the above stated cross correlation occurrences indicate that the extent of variation between these variables is not sufficient and there might be overlapping in what they are measuring.

In addition, another validity outcome that was insufficient is related to the factor loading of the fourth item of the Image (IM4) construct. The loading was below the acceptable level with -0.603. The acceptable value for items' loadings (in absolute terms) is 0.707 or above (Vinzi et al. 2010). The complete factor loadings table of the pilot study is provided in appendix 4-2.

To tackle such weak statistical measures for some constructs, for the final phase, the research team decided to reconsider some of the questions within the problematic constructs as follows:

(1) For PWA, item 3 was deleted because it is a repetition of RA (item 4).
PWA (item 3) stated: "This website (MOI e-Portal) makes the exchange of information between me and the government departments easy".
RA (item 4) stated: "Using MOI e-Portal services makes it easier to interact with the government".
It can be clearly seen that both questions inquire about the easiness level of interacting with government. This unnecessary repetition might be partially responsible for the high cross correlation between PWA and RA.

(2) PWA (item 7) was deleted because it is a repetition of PWA (item 2).
PWA 7 stated that: "There is a good search facility on the webpage (MOI e-Portal)". PWA 2 stated that: "This website (MOI e-Portal) is easy-to-navigate (e.g. clickable links, in-site search feature, clear presentation)".

(3) PWA (item10) stated that: "The page or portal download very easily, which saves me effort". And PWA (item9) stated that: "The page or portal download very easily, which saves me time". Due to clear resemblance between the two items and to avoid repetition and confusion as well as enhancing statistical measures, they were combined into one question, which is "The page or portal download very easily, which saves me time & effort".

(4) For RA, item 1 stated that: "Using MOI e-Portal services enhances my efficiency in gathering information from the government". And RA (item 2) stated that: "Using MOI e-Portal services enhances my efficiency in interacting with the government". Due to clear resemblance between the two items and to avoid repetition and confusion, similar to the previous point, they were combined into one question, which is "Using MOI e-Portal services enhances my efficiency in gathering

information & interacting with the government (e.g. requires less time and/or effort".

(5) For IM, item 4 was deleted because it is a repetition of IM item 3.
IM 4 stated that: "People who use MOI e-Portal services have less prestige than those who do not (less status or reputation".
IM 3 stated that: "People who use the web to gather information from the government have more prestige than those who do not (high status or reputation".

4.7.2 Questionnaire Revision

In addition the previously described changes to the final survey questionnaire that were intended to enhance the weak statistical measures, the research team decided to make additional alterations to some questions. After completing the pilot phase, the questionnaire was re-assessed, which led to finding that some questions were very similar in a way that might cause confusion and unnecessary duplication. Accordingly, changes were made as follows:

(1) COM (item 1) stated that: "I think using MOI e-Portal services fits well with the way that I like to gather information from the government". And COM (item 2) stated that: "I think using MOI e-Portal services fits well with the way that I like to interact with the government". Therefore, to avoid repetition and confusion, and to enhance statistical measures, they were combined into "I think using MOI e-Portal services fits well with the way that I like to gather information & interact with the government".

(2) PWA (item11) was deleted because UI (item 2) revolves around the same idea.
PWA 11 stated that: "It is a new service that I am very interested in trying". UI 2 stated that: "I would use MOI e-Portal services provided over the Web".

(3) For UI, item 3 was deleted because it is a repetition of UI (item 2).
UI 3 stated that: "Interacting with MOI e-Portal over the Web is something that I would do".
UI 2 stated that: "I would use MOI e-Portal services provided over the Web".

(4) A new question was added to the final questionnaire to statistically determine whether or not participants are using MOI e-portal. The question stated: "Do you (or have you ever) use MOI e-portal?".

According to the above explained changes to some of the questionnaire items, the following tables 4.14, 4.15, 4.16, 4.17 & 4.18 summarise the final constructs to be used for the final survey questionnaire along with the items of each construct.

Table 4.14. Attitudinal Beliefs Constructs & items – Final Phase

Attitudinal Beliefs		
Construct	**Items**	**Source**
Social Influence (Primary Influence)	1. People who are important to me think that I should use MOI e-Portal 2. People who influence my behavior think that I should use MOI e-Portal 3. People whose opinions I value think that I should use MOI e-Portal	(Venkatesh & Morris, 2000a)
Perceived Cyber Risks	1. Using a MOI e-Portal service may expose me to online frauds 2. Using a MOI e-Portal service may expose me to identity theft 3. Use of a MOI e-Portal service may expose me to cyber criminals 4. Using a MOI e-Portal service may expose me to malicious attacks	(Grazioli & Jarvenpaa, 2000)
Perceived Website Assistance	1. I can get the information that I am interested in on this website 2. This website (MOI e-Portal) is easy-to-navigate 3. The way this website (MOI e-Portal) displays its services is efficient 4. This website has good text size 5. This website has good colours that I can see 6. There is a good frequently answered section that I can consult for any confusing information 7. The page or portal download very easily, which saves me time & effort	(Flavián et al. 2006; Wu, 2009)

Table 4.15. Innovation Attributes Constructs & items – Final Phase

Innovation Attributes		
Construct	**Items**	**Source**
Compatibility	1. I think using MOI e-Portal services fits well with the way that I like to gather information & interact with the government 2. Using MOI e-Portal services to interact with the government fits into my lifestyle 3. Using MOI e-Portal services to interact with the government is incompatible with how I like to do things	(Carter & Bélanger, 2005)
Relative Advantage	1. Using MOI e-Portal services enhances my efficiency in gathering information & interacting with the government 2. Using MOI e-Portal services does not make it easy to gather information from the government 3. Using MOI e-Portal services makes it easier to interact with the government 4. Using MOI e-Portal services gives me greater control over my interaction with the government	(Carter & Bélanger, 2005)
Complexity	1. Learning to interact with MOI e-Portal is easy for me 2. I believe interacting with MOI e-Portal is a clear and understandable process 3. I find MOI e-Portal to be flexible to interact with 4. It is easy for me to become skilful at using MOI e-Portal 5. I find MOI e-Portal difficult to use	(Carter & Bélanger, 2005)

Table 4.16. Subjective Norms Constructs & items – Final Phase

Subjective Norms		
Construct	**Items**	**Source**
Image	1. People who use the web to gather information from the government have a high profile 2. People who use MOI e-Portal services have a high profile 3. People who use the web to gather information from the government have more prestige than those who do not 4. Interacting with the government over the web enhances a person's social status	(Carter & Bélanger, 2005)

Table 4.17. Trustworthiness Constructs & items – Final Phase

Trustworthiness		
Construct	**Items**	**Source**
Trust of Internet	1. The Internet has enough safeguards to make me feel comfortable using it to transact personal business with MOI e-Portal 2. Feel assured that legal and technological structures adequately protect me from problems on the Internet 3. In general, the Internet is now a robust and safe environment	(Bélanger & Carter, 2008)
Trust of Government	1. I think I can trust government agencies 2. Government agencies can be trusted to carry out online transactions faithfully 3. I trust government agencies to keep my best interests in mind 4. In my opinion, government agencies are trustworthy	Bélanger & Carter, 2008; Van Slyke et al. 2004; Gefen, 2000)
Disposition to Trust	1. I generally do not trust other people 2. I generally have faith in humanity 3. I feel that people are generally reliable 4. In general I trust other people unless they give me reason not to	(Lee & Turban, 2001; Gefen, 2000)

Table 4.18. Key Dependent Construct & items – Final Phase

Key Dependent Construct		
Construct	**Items**	**Source**
Behavioural Intentions (Use Intentions)	1. I will use MOI e-Portal for gathering government information 2. I will use MOI e-Portal services provided over the Internet, Web, portal 3. I will not hesitate to provide information to the MOI e-Portal	(Pavlou, 2003; Van Slyke et al. 2004; Bélanger & Carter, 2008)

4.7.3 Sampling Issues

In chapter 3, it was elucidated that a non-probability snowball sampling was applied to collect the data for the pilot phase. Snowball sampling was selected because the researcher had already established contacts with people who were also regarded as potential participants. Those contacts then assisted in recruiting more people to participate in the survey. As the first field surveying experience, the non-probability snowball sampling helped the researcher to collect the required data and to gain more experience and surveying skills, which were later used at the final phase.

However, from this experience, a lesson that the principal researcher learnt is that the employment of snowball sampling for the final data collection would neither be advantageous nor practical. Instead, simple random sampling through the use of area random sampling would be much more feasible. Reasoning for this conclusion is as follows:

- Although the snowball sampling technique was effective in recruiting participants for the pilot phase, it was very time consuming, which meant that it is impossible to recruit the intended sample size (around 1000) for the final phase in the available time frame (around 3 months).
- Area random sampling is normally applied for geographically large area, which was the case for the research at hand (Kothari, 2004). Therefore, the use of this technique would allow more appropriate coverage of the sub-areas (neighbourhoods) within Hail city.
- The employment of probability sampling techniques increases the efficiency by offering more flexible participants' recruitment process. Unlike snowball sampling, there is no need to make arrangements in advance to meet up with potential participants or to disseminate the questionnaire. In other words, the researcher is not restrained by time and location "when and where".
- Unlike non-probability snowball sampling, simple random sampling increases the chances for every household within the created sub-areas of Hail city to be included (Kothari, 2004). Accordingly, the sample is more likely to have the characteristic of independence of cases which is an assumption underlying the hypothesis tests.

4.8 Chapter Summary

The pilot phase of this study was comprehensively discussed in this chapter. The objectives and aims of the pilot included many aspects such as testing the data collection instrument, developing analysis methods and assessing available resources. Thereafter, the forms of survey questionnaires applied were identified, which are paper-based questionnaires, face-to face questionnaires and Internet-based questionnaires. This was followed by a brief description of the development of construct measures along with explanations of how their

items had been phrased and presented to respondents. The following section then presented the outcomes of the content validation procedures that were undertook to establish validity for data collection instrument. Further, the sampling method applied to this pilot study was the snowball technique; therefore, the selection and employment of this technique was justified and explained. Various aspects of the findings were next provided, including demographics, reliability and validity measurments, structural model analysis and hypotheses testing. The last part of this chapter was dedicated to provide the lessons learned throughout the course of conducting the pilot phase.

Chapter 5

Research Findings

5.0 Introduction

Chapter five is intended to provide the findings of the final data analysis of this research. In the first section 5.2, this chapter begins with explaining the sampling design used for the final data collection phase. Then section 5.2 and 5.3 shed lights on the response rate of the final survey as well as the possible survey errors. The sampling error section covers the areas of sampling error, coverage error, measurements error and non-response error. This is followed by section 5.4 where detailed demographic variables analysis is provided. Next is section 5.5, which is dedicated to the analysis of the theoretical model. Sub-sections then will provide detailed information on sampling adequacy, descriptive statistics, constructs measurements reliability, hypotheses testing and sub-groups analysis. Finally, conclusion of this chapter will be provided in section 5.6.

5.1 Sampling Design

As mentioned earlier in chapter three that for the final phase, a combination of probability sampling techniques were used, namely area random sampling and simple random sampling. Probability samples (or representative samples) are based on random selection methods in which the probability for each element or case in the sampling frame to be selected is equal (Donley & Grauerholz, 2012). To avoid repetition, detailed justification of the sampling methods selection is provided in chapter 3, section 3.11.3.

The first stage started with area random sampling, which can be viewed as being part of cluster sampling because it applies the same technique of creating ‘clusters’. This stage started with defining the total area; followed by the creation of ‘smaller non-overlapping geographical clusters’. The total area was identified as the City of Hail while the smaller subareas (neighbourhoods) were determined based on already existing divisions that are being used by real estate agencies, resulting in identifying 24 neighbourhoods (see figure 5.1 and table 5.1).

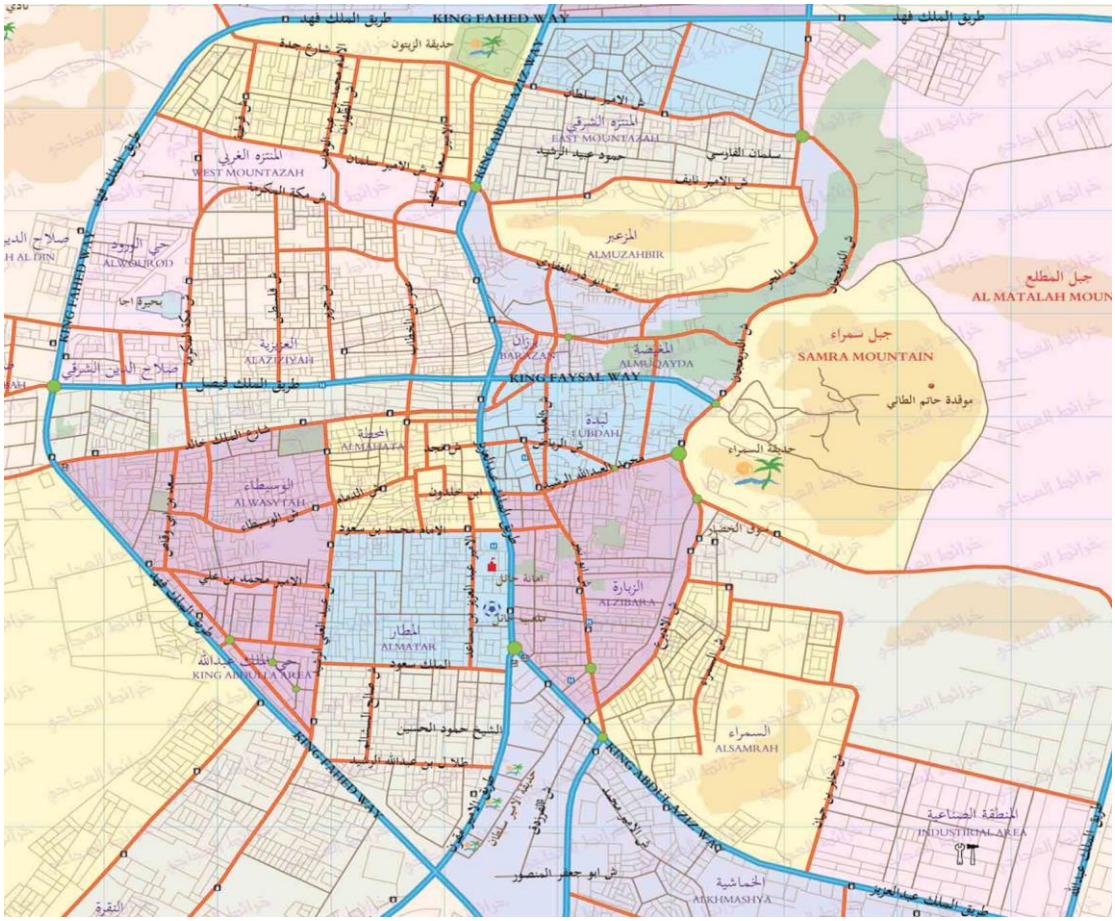


Figure 5.1. Neighbourhoods of Hail City (source: ajajimaps.com)

The next step took place between the periods of 18 July and 12 Oct 2016 in which simple random sampling was applied to reach households within those pre-defined subareas. The selection of the subareas and the households was conducted at random. Table 5.1 exhibits more information on those randomly selected neighbourhoods and households. The number of questionnaires distributed was based solely on the size of the neighbourhood in which more questionnaires were distributed in larger neighbourhoods to maximise equal representation as much as possible. Further, throughout this process, the researcher knocked at residents' houses and distributed the survey questionnaires to households' residents in Hail. The application of the aforementioned sampling methods resulted in distributing a total of 1656 questionnaires to households that led to 1147 replies (see appendix 4-1 for the final survey questionnaire). However, only 937 were valid and completed whereas the remainder were discarded because of their incompleteness with many unanswered questions. Although 1000 completed responses were initially targeted, due to resources restrains in terms of time, budget and manpower, 937 valid responses were considered sufficient for the purpose of this research as they are near to the initial size target. Further, to ensure that all the participants had proper means of providing a response, participants had the chance to provide their answers in a face-to-face manner in which the researcher himself collected their answers, resulting in 176 cases. Alternatively, the other choice was

to receive a hard copy of the questionnaire and the researcher collects it at a later time, resulting in 761 cases. Finally, as the study took place in Saudi Arabia, division between genders is an issue that was mitigated by having a female assistant (this was approved by the UOH ethics committee, refer to Appendix 3-7) accompanying the researcher for a month when visiting participants at their houses in an attempt to increase the number of female participants.

Table 5.1. Sampled subareas - final phase

Neighbourhoods	Distributed Questionnaires	Received Questionnaires
Alnoukra	100	75
Alsamrah	100	73
Sababah	100	66
Lubdah	100	73
Alzibara	100	71
Barzan	100	64
Almatar	100	69
Almahatah	90	65
Aljamiyeen	90	62
Almuntazah East.	71	56
Almuntazah West.	70	52
Alazizyah	70	47
Alwisytah	65	40
King Abdullah Area	65	48
Alkhamashyah	65	43
Salah Aldin East.	50	33
Salah Aldin West.	50	31
Algabal	50	34
Almasif	50	36
Alworod	40	34
Alzahra	40	27
Almuzaber	30	17
Alkhuzama	30	12
Alshifa	30	19
Total	1656	1147

5.2 Response Rate

A response rate is a mathematical calculation that aids with understanding the state and bias in an investigation (Saunders et al. 2009). It can be calculated by dividing the number of valid responses by the number of the sample (ibid). In this research, although households were targeted as the sampling units, individuals were the actual analysis units, not households. This was due to the fact that households included for this study were not restricted to only one participant per household. Therefore, the acquired responses are a representation of individuals who were 50 years and above. As stated earlier, 1656 questionnaires were distributed, only when the participants agreed to assist the researcher.

In total, 1147 responses received back; 937 of which were regarded as valid and completed. This number represents approximately 94% of the initially targeted sample size of 1000, which is a very good rate. Further, according to Saunders et al. (2009) and based on the above information, the response rate was calculated as follows:

$$response\ rate = \frac{number\ of\ valid\ responses}{sample\ number} = \frac{937}{1656} = 0.56\ or\ 56\%$$

In literature, there is no consensus on what is considered an adequate response rate and what is not (Nulty, 2008). However, response rates of 50% or 60% or 70% are all found in literature to be sufficient (ibid). Therefore, in light of this, the response rate of this study, which is 56%, is satisfactory. Having determined the response rate, the next section sheds light on different aspects of survey errors.

5.3 Survey Error

Like any other human work, it is impossible to reach perfection when conducting a survey. There must be factors that relatively reduce the accuracy of the survey estimate (Stanley, 2011). Generally, there are four common sources of survey errors, which are:

Sampling error

In research, it is impossible for any sample to be completely representative of a population (Walliman, 2011). This flawed representation is known as the sampling error which reflects "the difference between the estimates derived from the sample and the true population values" (UK National Statistics, 2006, p.0). In terms of this research, it cannot be claimed there is no sampling error because it is impossible to survey the entire population of interest. However, it can be safely claimed that attempts were made to keep the sampling error to its minimal by using random sampling for the final phase, which minimises the bias resulting from the sampling error (Kothari, 2004). Further, another factor supporting this claim is the relatively high degree of homogeneity in the sample population of this research (senior Saudis 50+). More homogeneity in the sample reflects lower levels of sampling errors (ibid).

Coverage errors

According to The UN Statistical Office (1984), "coverage errors arise from failure to cover adequately all components of the population being studied" (p.65). Therefore, coverage errors usually occur as a direct result of inadequate sampling frames (ibid). For the final phase of this research, the magnitude of coverage errors was mitigated by the following two factors: the sampling frame included almost all Saudi senior citizens above the age of 50 residing in Hail city, and then the random sampling methods used to collect data had provided all of them with equal opportunities of being included in the sample.

Measurement error

Measurement error may appear as a result of faulty measuring instruments (e.g. questionnaires & interviews) (Kothari, 2004). Such faults may appear in the form of complex wording of questions, ambiguous meanings, inaccurate instructions, insufficient space for responses, etc. (Dillman, 2007). As for this research, measurement error was minimised in two ways; firstly, by validating the content of the survey questionnaire. The procedures of content validity were explained in details in chapter 3. Secondly, after completing the pilot phase, the questionnaire was further enhanced and updated based on the results of constructs' reliability and validity measurements (refer to chapter 4 sections 4.7.1 & 4.7.2). Finally, the last action taken to minimise any possibility of measurement error was to remove all incomplete responses received from participants, which might have a negative impact on analysis outcomes.

Non-response error

Non-response error occurs when some individuals of the sample refuse to answer or give incomplete answers or they are ineligible to respond (Saunders et al. 2009). Non-response error may also arise when the researcher is unable to locate participants or unable to contact them (ibid). Consequently, the total population will be inadequately represented by respondents, which may generate biased data. Bias in this context reflects the degree to which parts of the population being insufficiently represented (Walliman, 2011). As for this research, non-response error was inevitable and did occur, given that the response rate was 56%, indicating that many potential respondents did not participate in the survey. However, the main concern was in relation to possible gender non-response bias. It was predicted before the commencement of this project that males will outnumber the females because of the cultural and traditional norms of the Saudi society and the division between genders. Collected data showed that female participants comprised less than half of the final sample. Therefore, to ensure that there was equal and accurate representation of the genders despite these differences, and to avoid any possible nonresponse bias, this research applied the corrective weighting approach to the gender variables using SPSS (Politz & Simmons, 1949; Lahaut et al. 2002; Berg, 2005). The technique of gender-weighting allows analysing the data as if there were equal numbers of males and females in the study.

Having identified the survey errors, the following sections will provide a comprehensive analysis of the final data collected through the survey questionnaires.

5.4 Demographics

In this section, the key demographic information will be presented in their original status with no changes to gender weights in order to to provide the readers with a general idea of the dataset collected. In terms of age, as depicted in table 5.2, the age band 60-69 comprised the highest majority among all age bands with 55.1%, followed by the age band

50-59 with 36%, whereas participants over the age of 70 years old comprised less than 10% of the total sample. In terms of gender, the majority of participants fell into the male category with 644 cases, comprising 68.7% of the total sample while the female participants comprised only 31.3% with 293 cases. This magnitude of variation between the number of males and females has led to the application of the previous mentioned gender weighting technique. As for the education variable, holders of a secondary school certificate made up to 30.4% with 285 cases, 174 participants held a college diploma (18.6%), and 28 cases were illiterate comprising 3% of the total sample. More details on age, gender and education are depicted in table 5.2 below.

Table 5.2. Socio-demographic Summary – age / gender & education (n=937)

	Intervals	Frequency	Percentage
Age	50-59	337	36%
	60-69	516	55.1%
	70-79	69	7.4%
	80-89	13	1.4%
	Over 90	2	0.2%
	Total	937	100%
Gender	Male	644	68.7%
	Female	293	31.3%
	Total	937	100%
Education	Higher Degree/Postgraduate	10	1.1%
	1st Degree (BA / BSc)	123	13.1%
	College Diploma	174	18.6%
	Technical Certificate	21	2.2%
	Secondary School Certificate	285	30.4%
	Primary School Certificate	181	19.3%
	Can Read and Write Arabic	115	12.3%
	Illiterate	28	3%
	Total	937	100%

In terms of employment status, table 5.3 shows that the largest groups fell into the categories of employed full time, unemployed (6+ months), retired (under 65) and pensioner 65+ respectively, comprising approximately 93 % of the total sample. In contrast, the categories of unemployed (less than 6 months), employed part time and self-employed were the lowest, comprising as low as 2% of the total sample. As for health status, the category of "good" health status comprised 65.5% with 614, followed by 176 cases for the category of "poor" health status, and finally 147 cases for the category of "excellent" health status with 147 cases. Table 5.3 below provides more detail.

Table 5.3. Socio-demographic Summary – employment & health (n=937)

Category	Intervals	Frequency	Percentage
Employment Status	Pensioner 65+	170	18.1
	Retired (under 65)	203	21.7
	Employed full time	261	27.9
	Employed part time	7	0.7
	Self-employed	12	1.3
	Own my own business	22	2.3
	Unemployed (for medical reasons)	24	2.6
	Unemployed (6+ months)	236	25.2
	Unemployed (less than 6 months)	2	0.2
	Total	937	100.0
Health Status	Excellent	147	15.7
	Good	614	65.5
	Poor	176	18.8
	Total	937	100.0

Finally, in terms of respondents' occupations, more than half were public sector employees with 503 cases comprising 53% of the total sample. Second largest group fell into the category of "housewife" with 172 cases and about 18.4% of the total sample. On the other hand, the categories of "Plant/Machine Operator" and "Legislator/Manager" depicted the lowest number with only 4 and 13 cases respectively. Table 5.4 below offers more detailed

information on the variable of occupation. More non-weighted demographic details for this phase are available in appendix 5-2.

Table 5.4. Socio-demographic Summary – Occupation (n=937)

Category	Intervals	Frequency	Percentage
Occupation	Academic/Teacher	53	5.7
	Agricultural/Forestry/Fishery	28	3
	Public Sector Employee	503	53.7
	Trade/Craft /Freelance	64	6.8
	Legislator/Manager	13	1.4
	Plant/Machine Operator	4	0.4
	Services/Sales	42	4.5
	Officer	29	3.1
	Housewife	172	18.4
	Not Specified	29	3.1
	Total	937	100.0

5.4.1 Gender-weighted Demographics & Interned Adoption

Having provided a general summary on the key socio-demographic variables, subsequent sections will provide more detailed information on socio-demographic variables and Internet adoption, but this time the gender weighting technique will be applied. For readers' information, as will be seen from following tables, that the total numbers of participants might differ very slightly from one variable to another due to rounding as a result of the application of the gender-weighting formula. For example, for the variables of age and gender the total number of participants is 936 where as for the education variable, the total of participants is 938. In addition to the cross-tabulations, more rigid statistical test will also be used to determine whether or not there exists an association between each independent variable and the dependent variable Internet adoption. This test is the *Fisher's exact test*, which is used to check whether any given two variables are independent from each other by examining whether the proportions of one variable are different based on the value of the other variable (McDonald, 2014). Although there are many well-known tests of independence such as chi-square test or G-test, Fisher's exact test is deemed the most suitable in this case because the sample size is small compared to nation-wide studies with sample size of thousands. Fisher's exact test is recommended when the sample size is less than 1000 (McDonald, 2014). Further, other tests such as chi-square are approximation

tests while Fisher's test is one of exact tests that should be used when more than 20% of cells have expected frequencies less than 5, which is the case in some of the tables as will be seen. The application of approximation techniques when more than 20% of cells have expected frequencies less than 5 is considered inappropriate. In other words, Fisher's exact test does not depend on sample or cell size restrictions (Lin et al. 2015). Fisher's exact test will be calculated using SPSS software package where judgment on significance will be based on the general rule that an alpha level (p-value) of .05 or less denotes significance (Kim, 2017).

Age

Table 5.5 below reveals that 663 (70.8%) out of 936 respondents are Internet adopters, 259 (27.6%) respondents are non-Internet adopters, and finally only 14 (1.4%) respondents have plans to adopt the Internet. In terms of age, which is the main theme of this study, participants within the age band 50-59 were foremost with 95.9% adoption rate comprised of 308 cases, whereas 2.4% within the same age group are non-adopters, and 1.5% with a plan to become adopters. Further, 349 participants within the age group of 60-69 were adopters (66.7%) and 166 were non-adopters (31.7 %). As for the age group 70-79, 8.1% of the participants were adopters with 6 cases whilst 90.5% were non-adopters with 67 cases. Additionally, participants within the age groups of 80-89 and over 90 showed an absolute tendency not to adopt the Internet with all of the 18 cases (100%). It can be concluded that age is an important influential element with regard to Internet adoption among older adults as the above results showed a clear decrease in the likelihood of Internet adoption as age increases. To further establish the association between age and Internet adoption, and to examine whether they are independent of each other or not, Fisher's exact test was run on SPSS. The result shows a statistical significance in which p-value < 0.001 confirms the association.

Table 5.5. Age & Internet Adoption (Gender-Weighted, n=937)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Age	50-59	308	95.9	8	2.4	5	1.5	321	34.2
	60-69	349	66.7	166	31.7	8	1.5	523	55.8
	70-79	6	8.1	67	90.5	1	1.3	74	7.9
	80-89	0	0	16	100	0	0	16	1.7
	Over 90	0	0	2	100	0	0	2	0.2
	Total	663	70.8	259	27.6	14	1.4	936	100

Gender

In terms of gender, the number of male adopters was 385, which comprises 82% of the overall male respondents. Comparatively, the female adopters comprise 59% of the overall female participants with 278 cases (see table 5.6). Accordingly, although the gender-weighting technique was applied to establish a balance between genders due to a low participation level within the female population, results imply a larger Internet diffusion within the male older adults than the female older adults. This association between gender and Internet adoption was also suggested in the result of Fisher's exact test ($p < 0.001$).

Table 5.6. Gender & Internet Adoption (Gender-Weighted, n=937)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Gender	Male	385	82	74	16	9	2	468	50
	Female	278	59	185	40	5	1	468	50
	Total	663	70.8	259	27.6	14	1.4	936	100

Education

When considering the education level of respondents, all holders of higher and 1st degrees are Internet adopters with 9 and 97 cases respectively. College diploma holders were 159; 98.1% of which were adopters, 1.2% were non-adopters, and 0.6 have plans to become adopters. As for the technical certificate holders, 93.7% were Internet adopters and 6.3% have plans to use the Internet. Further, the majority of secondary school certificate holders, who made up the largest number within the education category with a total of 274 cases, were Internet adopters with a percentage of 91.2%. The adopters within the holders of a primary school certificate comprised 57.2% of their total number (208), while the non-adopters comprised 40.8%. Respondents who could only read and write (with no official educational certifications) were Internet adopters by only 12.2% with 17 cases, and non-adopters by 83.4% with 116 cases. Finally, all of the 36 cases that fell into the "illiterate" category were non-Internet adopters. In general, these results indicate that the higher education level of an older adult, the more likelihood of him/her to adopt the Internet (see table 5.7). Further, an independency test was also employed to examine whether Internet adoption and education level are associated. Fisher's exact test shows there is sufficient evidence to claim an association exists ($p < 0.001$).

Table 5.7. Education & Internet Adoption (Gender-Weighted, n=937)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Education	Higher Degree/ Postgraduate	9	100	0	0	0	0	9	0.9
	1st Degree	97	100	0	0	0	0	97	10.3
	College Diploma	156	98.1	2	1.2	1	0.6	159	16.9
	Technical Certificate	15	93.7	0	0	1	6.3	16	1.7
	Secondary School	250	91.2	22	8	2	0.7	274	29.2
	Primary School	119	57.2	85	40.8	4	1.9	208	22.1
	Can Read and Write Arabic	17	12.2	116	83.4	6	4.3	139	14.8
	Illiterate	0	0	35	97.2	1	2.7	36	3.8
	Total	663	70.6	260	27.7	15	1.5	938	100

Employment

In terms of employment status, table 5.8 depicted that part time employees came first with 100% Internet adoption level; however, it should be noted that their total number is as low as 6 only. Further, full time employed participants came second with 99% adoption level, and retired participants (under 65 years old) followed with Internet adoption rate of 93.6%. As for participants who own their own businesses, pensioners above 65 years old, and self-employed participants, levels of Internet adoption were, 72.2%, 66.1%, and 60% respectively. However, these relatively high Internet adoption levels dropped drastically with unemployed participants. The group of unemployed participants showed only 46.3% level of Internet adoption, and the group of unemployed participants (for medical reasons) showed a level of as low as 21% only. Finally, similar to what has been depicted in previous sections, the groups of non-adopters and planning-to-adopt comprise 27.6% and 1.7% respectively of the overall sample. From the above results, it can be clearly seen that the level of Internet adoption reduces when considering unemployed participants. Similar to the previously analysed variables, test of independence was used to check if an older adults' employment status is associated with their Internet adoption status. For that, Fisher's exact test was used, and the results confirmed the association with p-value of < 0.001.

Table 5.8. Employment & Internet Adoption (Gender-Weighted, n=937)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Employment Status	Pensioner 65+	90	66.1	41	30.1	5	3.6	136	14.4
	Retired (under 65)	162	93.6	7	4	4	2.3	173	18.3
	Employed full time	216	99	1	0.5	1	0.5	218	23.1
	Employed part time	6	100	0	0	0	0	6	0.63
	Self-employed	9	60	5	33.3	1	6.6	15	1.5
	Own my own business	13	72.2	5	27.7	0	0	18	1.9
	Unemployed (for medical reasons)	4	21	14	73.6	1	5.2	19	2
	Unemployed	165	46.3	187	52.5	4	1.1	356	37.8
	Total	665	70.6	260	27.6	16	1.7	941	100

Occupation

As for occupation (current or former), as exhibited in table 5.9 below the greatest level of Internet adoption fell into the category of "academic/teacher" and "legislator/manager" with 100%, followed by the groups of "public sector employee" and "Services/Sales" with 86% for both of them. On the other hand, participants within the group of "Housewife" depicted only 50.3% level of Internet adoption. It is worthwhile to point out that the housewife group fell into the category of "unemployed" in the employment table, which explains the low level of Internet adoption within the unemployed participants. Again, Fisher's exact test confirms the association between the variables of occupation and Internet adoption status ($p < 0.001$).

Table 5.9. Occupation & Internet Adoption (Gender-Weighted, n=937)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Occupation	Academic/ Teacher	66	100	0	0	0	0	66	7
	Agricultural/ Forestry/Fishery	11	42.3	15	57.6	0	0	26	2.7
	Public Sector Employee	341	86.1	45	11.3	10	2.5	396	42.2
	Trade / Freelance	27	48.2	27	48.2	2	3.5	56	5.9
	Legislator/ Manager	11	100	0	0	0	0	11	1.1
	Services/Sales	37	86	6	14	0	0	43	4.5
	Officer	14	66.6	7	33.3	0	0	21	2.2
	Housewife	138	50.3	136	49.6	0	0	274	29.2
	Not Specified	18	40.9	23	52.2	3	6.8	44	4.6
	Total	663	70.7	259	27.6	15	1.6	937	100

Health

Table 5.10 below summarises the respondents' health status against Internet adoption status. The respondents chose from three health status categories; excellent, good or poor. The majority of respondents fell into the category of "good" with 618 cases comprising 66% of the overall sample. For the same health group, 510 (82.5%) participants were Internet adopters, 23 (12.2%) participants from the group of "poor" health status were adopters, and finally 130 (100%) participants from the "excellent" group were adopters. The 14 cases of participants planning to become Internet adopters belong to the group of "good" health status; comprising 2.2% only within the group.

It can be clearly seen that there is a strong relation between the participants' health status and Internet adoption, in which the better the health, the greater the likelihood of Internet adoption and vice versa. This strong relation was further established by the result of the Fisher's exact test of association, in which the two variables showed firm dependency of each other with a p-value of < 0.001.

Finally, it is worthwhile to point out that a large number of the "poor" health status' participants were above 70 years old as health generally deteriorates with age. This is again an indication of the significance of age as a leading factor with regard to Internet adoption.

Table 5.10. Health Status & Internet Adoption (Gender-Weighted, n=937)

Category		Internet Adopters		Non-Adopters		Planning to become adopters		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Health Status	Excellent	130	100	0	0	0	0	130	13.8
	Good	510	82.5	94	15.2	14	2.2	618	66
	Poor	23	12.2	165	87.7	0	0	188	20.1
	Total	663	70.7	259	27.7	14	1.5	936	99.9

The above socio-demographic results have raised an important question to be asked; that is, what possible association there might be between the factor of age and some other factors?. As this study is elderly-centric, it is important to check if such association exists, and whether or not by knowing the age of a given participant we might be able to predict his health status for example. Once such relation has been established, deeper understanding of older adults and the relevant influential factors will be formed. Therefore, the following three sections examine the associacion between age and education, age and employment status and finally age and health status.

Age & Education Level

Table 5.11 below exhibits the different age groups of partcipinats against their level of education to check for association. It can be seen that out of 321 particpants within the age band between 50-59 years old, 218 were holding diplomas or higher crtificates comprising about 70% of that age group. As for the age group between 60-69, the majority of participants (70%) only received primary or secondary school education. Finally, the level of education drastically drops when considering older-old participants who are 70 years old and above. This is a clear indication of the impact that age has on participants' education level. This association was also confirmed by running Fisher's exact test resulting in a *p*-value of < 0.001.

Table 5.11. Age & Education Level (Gender-Weighted, n=937)

Category		Education Level								Total	
		Diploma or above		Primary or Secondary School		Can Read and Write Arabic		Illiterate			
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Age	50-59	218	67.9	101	31.5	2	0.6	0	0	321	34.3
	60-69	63	12	367	70	90	17.2	4	0.8	524	55.9
	70-79	0	0	13	17.3	42	56	20	26.7	75	8
	80-89	0	0	0	0	5	33.3	10	66.7	15	1.6
	+ 90	0	0	0	0	0	0	2	100	2	0.2
	Total	281	30	481	51.3	139	14.8	36	3.8	937	100

Age & Employment Status

Table 5.12 below shows that in terms of employment status, older adults are not identical groups in which the older the participant, the less likelihood of being employed. For example, the age group of 50-59 years old depicted 66% employment rate whereas the rate for the age group of 60-69 years old was at 7.8% only. Employment rate fell even more when considering the age groups of 70-79, 80-89 and 90+ with rates of 4.1%, 0% and 0% respectively, implying the age and employment states are dependent of each other which was also established using Fisher's exact test (p-value < 0.001).

Table 5.12. Age & Employment Status (Gender-Weighted, n=937)

Category		Employment Status							
		Retired		Employed full or part time		Unemployed (for any reason)		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Age	50-59	55	17.1	212	66	54	16.8	321	34.4
	60-69	236	45	41	7.8	247	47.1	524	56
	70-79	15	20.3	3	4.1	56	75.7	74	7.9
	80-89	1	6.7	0	0	14	93.3	15	1.6
	+ 90	0	0	0	0	2	100	2	0.2
	Total	307	32.8	256	27.4	373	39.9	936	100

Age & Health Status

Health status has always been associated with age in which the increase in age generally leads to a decline in health status. The data in table 5.13 below clearly supports this cliam in which health deteriorates with age. For example, all of the participants who were over 80 years old described their health conditions as 'poor'. However, the rate of poor health status decreased when considering younger adults until it reached as a low as 0.9% within the age group of 50-59. Further, fisher's exact test has once again confirmed this association with p-value < 0.001.

Table 5.13. Age & Health Status (Gender-Weighted, n=937)

Category		Health Status							
		Excellent		Good		Poor		Total	
		Cases	%	Cases	%	Cases	%	Cases	%
Age	50-59	124	38.6	194	60.4	3	0.9	321	34.3
	60-69	7	1.3	415	79.2	102	19.5	524	55.9
	70-79	0	0	9	12.2	65	87.8	74	7.9
	80-89	0	0	0	0	16	100	16	1.7
	+ 90	0	0	0	0	2	100	2	0.2
	Total	307	32.8	256	27.4	373	39.9	937	100

In the previous section, the significance of the age variable was assessed against the socio-demographic factors of education, employment status and health status. This was important to better understand how age affects other factors, which in turn affect the use and acceptance of Internet by the elderly. The outcomes revealed that beside the direct effect of age on the Internet adoption status, which has already been established earlier in this chapter, age has a decisive indirect effect of Internet adoption by affecting other important factors, such as education level, employment status and health status. This once again confirms the notion that older adults are not identical groups; rather, they can be classified into more than one age group.

5.5 Theoretical Model Analysis

To remind readers, the first part of the final data analysis that was presented in the previous sections concentrated on the demographics information, which is directly related to the first research question. The first research question is provided in chapter one, which stated: what socio-demographic variables significantly influence an older individual to adopt or not adopt the Internet?. Therefore, the analysis of demographic data has assisted in offering the answer to that question. Further elaborations will also be provided in chapter six (discussion).

As for this section, it concerns the second part of the final data analysis, which will be dedicated to analysing the theoretical model of the research in order to answer the second research question, which stated: What attitudinal, subjective norms, control and trustworthiness factors significantly influence an older individual intention to use or not use the MOI e-portal services?. Accordingly, this part begins with sampling adequacy analysis and descriptive statistics, followed by construct measurements reliability and structural model analysis.

5.5.1 Sampling Adequacy

Establishment of sampling adequacy is important when factor analysis is sought, which is the case in this research. For that, Kaiser-Meyer-Olkin (*KMO*) is used in which determinations of whether or not the variables are adequately correlated within the sampling adequacy test are made (Hinton et al. 2004).

Kaiser-Meyer-Olkin (KMO) Test

KMO test outcome is a value between 0 and 1 where values above 0.8 indicate sampling adequacy, and consequently suitability for factor analysis (Munro, 2005). In term of this research, the sample used for KMO test was (n=703), which is the total sample that was used for structural model analysis. Table 5.11 shows that KMO value for this research is 0.981, indicating sampling adequacy and suitability to conduct factor analysis.

Table 5.14. *KMO* and *Bartlett's* Sampling Adequacy Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.981**
Bartlett's Test of Sphericity	Approx. Chi-Square	59575.597
	df	946
	Sig.	**.000**

Bartlett's Test of Sphericity

Another test that has been widely used in literature to establish suitability for conducting a factor analysis is the Bartlett's Test of Sphericity. Similar to *KMO* test, *Bartlett's* Test of Sphericity determines whether or not the model variables are adequately correlated for a factor analysis. As a rule of thumb, a *p*-value of less than 0.05 signifies appropriateness for carrying out a factor analysis (Hinton et al, 2004). As depicted in table 5.11, the *p*-value is .000, which is even less than 0.01; thus, appropriateness for carrying out a factor analysis is achieved.

5.5.2 Descriptive Statistics

Having provided demographic analysis of the final phase, this section will provide associated descriptive statistics, which are quantified demonstrations that enable researchers to make comparisons of the "parametric numerical data" (Walliman, 2011). In general, central tendency and dispersion are the two measures within datasets that descriptive statistics concentrate upon (Saunders et al. 2009). Both concepts have been explained and defined previously in chapter four (refer to section 4.6.2). In brief, central tendency is determined by one of three statistical methods, namely, the mean, the median or the mode. As for dispersion, the most frequently used measure is the standard deviation, which determines how data values are spread around the mean (ibid). As for the final analysis of this research, similar to the pilot analysis, the mean was used to measure central tendency whereas for dispersion, standard deviation was applied. The two measures where selected because they are proven to be effective for descriptive statistics of numeric datasets, and that they are the most frequently used methods among researchers (Kothari, 2004; Saunders et al. 2009).

Table 5.12 below shows the mean (μ) and standard deviation (σ) values for all of the construct measures used in the research. Interpretations of some of the values are next explained to provide the readers with an idea of the meanings behind the values. For instance, the mean value for the construct PWA1 was 4.60, which means that on average the respondents have a positive opinion with regards to that item. Another example is TOG4 where the mean was 5.85 reflecting very positive views from respondents towards the government, and that the government is trustworthy. This interpretation of the mean values is based on the fact that all items were based on Likert Scale questions in which 1 = Strongly Disagree, and 7 = Strongly agree. On the other hand, the mean value for IM1 was only 2.48, implying that the majority of respondents disagreed with IM related questions.

Table 5.12 also exhibits the values of standard deviation, which are indications of the variation extent among the collective answers of the respondents whereby greater values imply greater diversity and wider differences between the answers given by respondents. For example, the standard deviation for the item RA4 was 2.24, indicating that the respondents' views on that particular question were relatively diverse compared to other questions within the model. As for the item DTT2 for instance, the standard deviation was only 1.17, which implies relatively similar views with regards to that question.

Table 5.15. Descriptive Statistics. Final Construct Measurements (n=703)

Constructs & Items	μ	σ	Construct Definition
Social (primary) Influence (PI)			
PI1	**4.11**	**2.14**	- People who are important to me think that I should use MOI e-portal.
PI2	**4.13**	**2.17**	- People who influence me think that I should use MOI e-portal.
PI3	**4.13**	**2.19**	- People whose opinions I value think that I should use MOI e-portal.
Perceived Cyber Risk (PCR)			
PCR1	**3.57**	**1.96**	- Using MOI e-Portal service could expose me to online frauds.
PCR2	**3.58**	**2.04**	- Using MOI e-Portal service could expose me to identity theft.
PCR3	**3.24**	**2.02**	- Use of MOI e-Portal service could expose me to cyber criminals.
PCR4	**3.33**	**2.07**	- Using MOI e-Portal service could expose me to malicious attacks.
Perceived Website Assistance			
PWA1	**4.60**	**2.08**	- I can get the information that I am interested in on this website.
PWA2	**4.14**	**2.21**	- This website (MOI e-Portal) is easy-to-navigate.
PWA3	**4.21**	**2.20**	- The way this website (MOI e-Portal) displays its services is efficient.
PWA4	**4.62**	**2.09**	- This website has good text size.
PWA5	**4.75**	**2.09**	- This website has good colours that I can see.
PWA6	**4.21**	**2.23**	- There is a good frequently answered section that I can consult.
PWA7	**4.23**	**2.34**	- The portal download very easily, which saves me time & effort.
Compatibility (COM)			- Using MOI e-Portal services fits well with the way that I like to
COM1	**4.29**	**2.22**	gather information & interact with the government.
COM2	**4.31**	**2.24**	- Using MOI e-Portal services fits into my lifestyle.
COM3	**3.65**	**2.23**	- Using MOI e-Portal services is incompatible with my lifestyle.
Relative Advantage (RA)			
RA1	**4.41**	**2.22**	- Using MOI e-Portal services enhances my efficiency.
RA2	**3.70**	**2.19**	- It does not make it easy to gather information from the government.
RA3	**4.36**	**2.18**	- MOI e-Portal services make it easier to interact with the government.
RA4	**4.39**	**2.24**	- It gives me greater control over my interaction with the government.
Image (IM)			
IM1	**2.48**	**1.25**	- Online interaction with government indicates a high profile.
IM2	**2.44**	**1.24**	- People who use MOI e-Portal services have a high profile.
IM3	**2.39**	**1.23**	- Online interaction with government indicates more prestigious image.
IM4	**2.29**	**1.24**	- Online interaction with government enhances a person's social status.
Complexity (COMP)			
COMP1	**3.78**	**1.97**	- Learning to interact with MOI e-Portal is easy for me.
COMP2	**4.23**	**2.04**	- Interacting with MOI e-Portal is a clear and understandable process.
COMP3	**4.22**	**2.07**	- I find MOI e-Portal to be flexible to interact with.
COMP4	**4.24**	**2.09**	- It is easy for me to become skillful at using MOI e- Portal.
COMP5	**3.81**	**2.05**	- I find MOI e-Portal difficult to use.
Trust of Internet (TOI)			- Internet has enough safeguards (e.g. firewalls & security certificate).
TOI1	**4.34**	**2.00**	- I feel assured that legal and technological structures adequately
TOI2	**4.31**	**2.10**	protect me from problems on the Internet.
TOI3	**4.66**	**2.17**	- In general, the Internet is now a robust and safe environment.
Trust of Government (TOG)			
TOG1	**5.57**	**1.28**	- I think I can trust government agencies (integrity & ability).
TOG2	**5.72**	**1.29**	- Government can be trusted to carry out online transactions faithfully.
TOG3	**5.52**	**1.36**	- I trust government agencies to keep my best interests in mind.
TOG4	**5.85**	**1.32**	- In my opinion, government agencies are trustworthy.
Disposition To Trust (DTT)			
DTT1	**2.54**	**1.30**	- I generally do not trust other people.
DTT2	**5.51**	**1.17**	- I generally have faith in humanity.
DTT3	**5.29**	**1.19**	- I feel that people are generally reliable.
DTT4	**5.67**	**1.28**	- In general I trust other people unless they give me reason not to.
Use Intention (UI)			
UI1	**4.60**	**2.11**	- I will use MOI e-Portal for gathering government information.
UI2	**4.51**	**2.22**	- I will use MOI e-Portal services provided over the Internet.
UI3	**4.17**	**2.19**	- I will not hesitate to provide information to the MOI e-Portal.

*All measures are based on Likert Scale (1 = Strongly Disagree, 7 = Strongly agree)

5.5.3 Construct Measurement Reliability

Having provided sampling adequacy tests as well as the discriptive statistics, constructs measurements reliability will be provided at this juncture. Reliablility measures the stability and consistency of the constructs; therefore, reliablility must be determined (Litwin, 1995). In order to accomplish reliability, Cronbach's Alpha, Composite Reliability and Average Variance Extracted will be determined. Reasonign for this is provided below.

Cronbach's Alpha

Cronbach's Alpha is a widespread measurement utilised to determine the internal consistency of tests. When a test or a scale is internally consistent, it is implied that the indicators of the scale measure the same factor; therefore, there is an association with the correlations of the indicators within the score. Cronbach's Alpha is sometimes referred to as a coefficient alpha, which is conveyed as a digit between 0 and 1 (Tavakol & Dennick, 2011). An adequate reliability measure based on Cronbach's Alpha is 0.70 or above (Wang & Strong, 1996). For this study, table 5.13 depicts that all of the constructs' measurements utilised for this research study are over 0.7; thereby, meeting the Cronbach's Alpha criterion. From this, the outcome suggests that the questionniare applied in this study is internally consistent.

Although Cronbach's Alpha is one of the most frequently used gauge of internal consistency, there is a major criticism of it being a lower bound and consequently undervaluing true internal consistency. To prevent such situation, composite reliability is viewed to be a solution (Peterson & Kim, 2013). In the next section, a description of composite reliability and the findings in terms of this research that are determined using composite reliability are provided.

Composite Reliability

Although Cronbach's Alpha and Composite Reliability are similar, in which they both measure the reliability of constructs; however, it is claimed that Composite Reliability outperforms Cronbach's Alpha with regards to the accuracy of estimating the true reliability. The reason is that composite reliability permits variations of items loadings or weights, whereas the loadings or weights for Cronbach's Alpha are restricted to being equal (Peterson & Kim, 2013). Thus, Composite Reliability will be applied in this study in order to guarantee better and more reliable results. In composite reliability, when results display outcomes of 0.7 or above, it is considered to be satisfactory (Henseler et al. 2009). From table 5.13, it can be learnt that the overall constructs of this study display good reliability as they are all above 0.7.

Average Variance Extracted (AVE)

The Average Variance Extracted refers to the measurements of the explained variance of the construct. It checks whether the indicators of a construct explain more variance than do the indicators of the other constructs (Zait & Bertea, 2011). It assists with determining the agreement level between measures of the same construct, and how strong these measures correlate with each other (Guo et.al. 2008). The acceptable value of AVE should be 0.5 or above **(**MacKenzie et al. 2011). From table 5.13, it is learnt that all of the constructs meet the AVE adequate value.

Table 5.16. Results of reliability analysis

Construct	Number of Items	Cronbach alpha1	Composite reliability2	AVE3
COM	3	0.973	0.982	0.948
COMP	5	0.974	0.980	0.907
DTT	4	0.830	0.888	0.667
IM	4	0.982	0.986	0.948
PCR	4	0.982	0.987	0.949
PI	3	0.990	0.994	0.981
PWA	7	0.986	0.988	0.924
RA	4	0.976	0.983	0.934
TOG	4	0.962	0.972	0.897
TOI	3	0.977	0.985	0.957
UI	3	0.978	0.985	0.957

1= Satisfactory if >= 0.7 2= Satisfactory if >= 0.7 3= Satisfactory if >= 0.5

5.5.4 Construct Validation

Having established reliability of theoretical model constructs, validity of these constructs are next determined. Items of each construct are applied in research to measure certain things; thus it is essential to make sure that those items measure what they are meant to measure. For that reason, construct validity measurements are performed, which are convergent and discriminant validity (Vinzi et al. 2010).

Convergent Validity

Convergent validity is defined as "a set of indicators represents one and the same underlying construct, which can be demonstrated through their unidimensionality" (Henseler et al, 2009; p 299). To determine adequate convergent validity, the average variance extracted (AVE) can be used as a criterion. A value of 0.5 for an AVE signifies satisfactory convergent validity, suggesting that a construct is able to describe more than

50% of the variance of its items on average (ibid). From table 5.13, the convergent validity for all of the constructs is higher than 0.5, which is suffecient.

Discriminant Validity

Discriminant validity reveals the extent to which a particular construct varies from other constructs. To determine discriminant validity, the square root of AVE of each construct should be greater than any of the cross correlation between the construct and other constructs within the model (Vinzi et al. 2010). The table below **(**5.14**)** shows that a discriminant validity criterion is met in all of the cases.

Table 5.17. Construct Cross-Correlation Matrix and AVE analysis - Diagonal numbers (in bold Italic) are the square roots of the AVE

Construct	COM	COMP	DTT	IM	PCR	PI	PWA	RA	TOG	TOI	UI
COM	***0.974***										
COMP	0.905	***0.952***									
DTT	0.445	0.458	***0.817***								
IM	-0.157	-0.171	-0.196	***0.974***							
PCR	-0.863	-0.903	-0.466	0.186	***0.974***						
PI	0.877	0.916	0.416	-0.173	-0.882	***0.990***					
PWA	0.906	0.943	0.428	-0.174	-0.917	0.922	***0.961***				
RA	0.937	0.942	0.456	-0.157	-0.893	0.909	0.943	***0.966***			
TOG	0.577	0.581	0.682	-0.162	-0.560	0.550	0.572	0.596	***0.947***		
TOI	0.884	0.911	0.446	-0.173	-0.882	0.890	0.924	0.912	0.616	***0.978***	
UI	0.914	0.949	0.454	-0.197	-0.913	0.921	0.951	0.943	0.583	0.931	***0.978***

Factor Loadings

Another important examination of the construct validity is achieved by looking at the factor loadings. It indicates the correlation between each item and its construct. The acceptable value for items' loadings is 0.707 or above (Vinzi et al. 2010). For this study, each item has demonstrated a strong load to its construct except for the item DTT1 with a value of 0.691. However, this load is very close to the satisfactory value of 0.707; therefore, it doesn't damage the validity of the construct (see table 5.15 below).

Table 5.18. Factor Loadings & Cross Loadings

	COM	COMP	DTT	IM	PCR	PI	PWA	RA	TOG	TOI	UI
COM1	0.979	0.883	0.451	-0.171	-0.838	0.849	0.878	0.913	0.566	0.862	0.891
COM2	0.980	0.889	0.452	-0.161	-0.851	0.862	0.885	0.918	0.569	0.865	0.895
COM3	0.962	0.872	0.398	-0.126	-0.832	0.851	0.883	0.905	0.551	0.856	0.884
COMP1	0.866	0.950	0.407	-0.152	-0.858	0.879	0.903	0.899	0.544	0.869	0.909
COMP2	0.856	0.954	0.443	-0.166	-0.851	0.867	0.892	0.890	0.557	0.852	0.890
COMP3	0.857	0.960	0.455	-0.156	-0.857	0.877	0.895	0.897	0.556	0.870	0.898
COMP4	0.857	0.954	0.459	-0.184	-0.863	0.869	0.894	0.891	0.554	0.875	0.906
COMP5	0.872	0.943	0.418	-0.157	-0.873	0.871	0.905	0.908	0.553	0.872	0.913
DTT1	0.360	0.395	0.691	-0.167	-0.398	0.346	0.365	0.374	0.553	0.388	0.382
DTT2	0.356	0.345	0.845	-0.170	-0.338	0.317	0.313	0.350	0.565	0.341	0.343
DTT3	0.363	0.379	0.861	-0.128	-0.378	0.341	0.357	0.380	0.546	0.361	0.372
DTT4	0.370	0.370	0.859	-0.172	-0.399	0.348	0.357	0.379	0.554	0.360	0.378
IM1	-0.143	-0.155	-0.181	0.972	0.170	-0.159	-0.154	-0.139	-0.148	-0.155	-0.181
IM2	-0.150	-0.157	-0.186	0.982	0.177	-0.164	-0.164	-0.144	-0.161	-0.168	-0.189
IM3	-0.140	-0.151	-0.176	0.982	0.171	-0.154	-0.159	-0.142	-0.141	-0.156	-0.177
IM4	-0.173	-0.197	-0.215	0.959	0.202	-0.192	-0.195	-0.182	-0.178	-0.191	-0.215
PCR1	-0.833	-0.872	-0.447	0.188	0.969	-0.848	-0.887	-0.860	-0.544	-0.849	-0.882
PCR2	-0.845	-0.884	-0.439	0.167	0.977	-0.859	-0.898	-0.877	-0.540	-0.866	-0.894
PCR3	-0.841	-0.883	-0.473	0.188	0.976	-0.863	-0.894	-0.871	-0.553	-0.858	-0.890
PCR4	-0.845	-0.882	-0.456	0.182	0.974	-0.868	-0.896	-0.872	-0.546	-0.866	-0.892
PI1	0.859	0.898	0.406	-0.170	-0.869	0.988	0.908	0.894	0.539	0.876	0.906
PI2	0.874	0.915	0.417	-0.170	-0.879	0.994	0.919	0.905	0.550	0.886	0.917
PI3	0.872	0.910	0.414	-0.175	-0.874	0.988	0.912	0.902	0.546	0.883	0.912
PWA1	0.844	0.872	0.390	-0.183	-0.859	0.867	0.944	0.878	0.519	0.863	0.891
PWA2	0.876	0.916	0.404	-0.170	-0.884	0.897	0.965	0.913	0.555	0.896	0.922
PWA3	0.884	0.924	0.409	-0.170	-0.886	0.900	0.972	0.920	0.568	0.906	0.925
PWA4	0.866	0.903	0.414	-0.168	-0.883	0.886	0.962	0.899	0.530	0.876	0.906
PWA5	0.841	0.880	0.399	-0.160	-0.862	0.863	0.948	0.874	0.518	0.863	0.894
PWA6	0.884	0.915	0.425	-0.152	-0.891	0.888	0.967	0.923	0.574	0.902	0.922
PWA7	0.897	0.930	0.436	-0.168	-0.904	0.900	0.968	0.931	0.585	0.910	0.934
RA1	0.919	0.920	0.434	-0.150	-0.869	0.889	0.919	0.974	0.573	0.893	0.922
RA2	0.893	0.900	0.447	-0.138	-0.854	0.868	0.895	0.951	0.568	0.868	0.899
RA3	0.904	0.913	0.439	-0.163	-0.869	0.885	0.916	0.972	0.583	0.881	0.914
RA4	0.904	0.907	0.441	-0.157	-0.859	0.871	0.913	0.968	0.580	0.884	0.910
TOG1	0.562	0.565	0.625	-0.141	-0.538	0.534	0.556	0.583	0.951	0.603	0.568
TOG2	0.560	0.571	0.660	-0.181	-0.545	0.533	0.555	0.578	0.958	0.600	0.571
TOG3	0.538	0.533	0.622	-0.112	-0.510	0.511	0.527	0.551	0.943	0.572	0.537
TOG4	0.527	0.530	0.674	-0.179	-0.527	0.505	0.530	0.546	0.936	0.557	0.530
TOI1	0.855	0.882	0.440	-0.167	-0.858	0.861	0.898	0.884	0.606	0.977	0.908
TOI2	0.865	0.893	0.420	-0.153	-0.858	0.869	0.902	0.899	0.600	0.981	0.906
TOI3	0.873	0.899	0.448	-0.187	-0.873	0.882	0.912	0.894	0.600	0.975	0.916
UI1	0.891	0.925	0.460	-0.200	-0.890	0.896	0.927	0.922	0.568	0.905	0.976
UI2	0.904	0.939	0.450	-0.189	-0.905	0.908	0.939	0.934	0.578	0.920	0.986
UI3	0.888	0.921	0.422	-0.189	-0.884	0.898	0.924	0.913	0.564	0.907	0.973

5.5.5 Structural Model Analysis

A model is a simplification or estimation of reality. It is significant because it gives partial reflection of some characteristics of the reality through the parameters and the relationships between variables (Sharma & Kim, 2012). The model of this study was anlysed and tested using SmartPLS software package v.3.2.7. This software applies the analysing technique of Partial Least Squares based Structural Equation Modeling (PLS-SEM). It is a suitable technique for this study PLS-SEM is effective when the research is exploratory and is attempting to identify or predict fundamental target constructs. PLS-SEM is also appropriate for relatively complex structural model that includes several constructs and several items, which is the case in this study (Hair et al. 2011). Accordingly, the model was estimated and tested using SmartPLS, and the results are as follows:

Coefficient of Determination $(\boldsymbol{R^2})$

Coefficient of determination $(\boldsymbol{R^2})$ is a measure that determines the extent to which the proportion of variance in the dependent variable within the model can be explained and accounted for by the explanatory variables within the same model (Vyas, 2013). From the path analysis of the model using SmartPLS, the Coefficient of Determination (R^2) for the central dependent variable (intentions to use) is 0.945, which indicates that approximately 94% of the variability within the older adults' intentions to use the e-government services (MOI e-Portal) can be explained by the model (see figure 5.1). The R^2 value of 0.945 can be interpreted as significant, meaning that this value establishes sufficient explanatory power (Hair et al. 2011). In other words, the aforementioned R^2 result indicates that the dependent variable (intentions to use) can be sufficiently understood and explained by the independent variables in the model.

Researchers are in favour of the 'adjusted R^2 statistic', which takes the number of predictor variables within the regression equation into consideration. This preference is due to the fact that adjusted R^2 does not overvalue the extent of variability explained by the estimated regression model when adding one or more predictor variables (Saunders et al. 2009). As for the regression model at hand, the adjusted R^2 value is 0.924, indicating that approximately 92% of the variability within the older adults' intentions to use the e-government services can be explained by the model.

Path coefficients' significance

As mentioned in chapter 3 & 4, the model will be estimated using SmartPLS software package, which applies the analysing technique of Partial Least Squares based Structural Equation Modeling (PLS-SEM). For that, a basic path analysis of the model was carried out (refer to figure 5.2). A path analysis assists in determining the effect of the explanatory variables on the dependent variables. The values between the explanatory variables and the dependent variables are the path coefficients where indications of significance are offered (Hair et al. 2011). In addition to path analysis, bootstrapping analysis was also run (refer to figure 5.3). Bootstrapping offers more reliable assessments of the path coefficients' significance by using the available data as a distribution in order to compute sampling

errors and produce *t*-values (ibid). Significance was based on the rules of thumb for structural model evaluation, "Critical t-values are 1.65 (significance level = 10 percent), 1.96 (significance level = 5 percent), and 2.58 (significance level = 1 percent)" (Hair et al. 2011, p.145). The interpretations of the path coefficients resulted from the analysis are discussed in the next section.

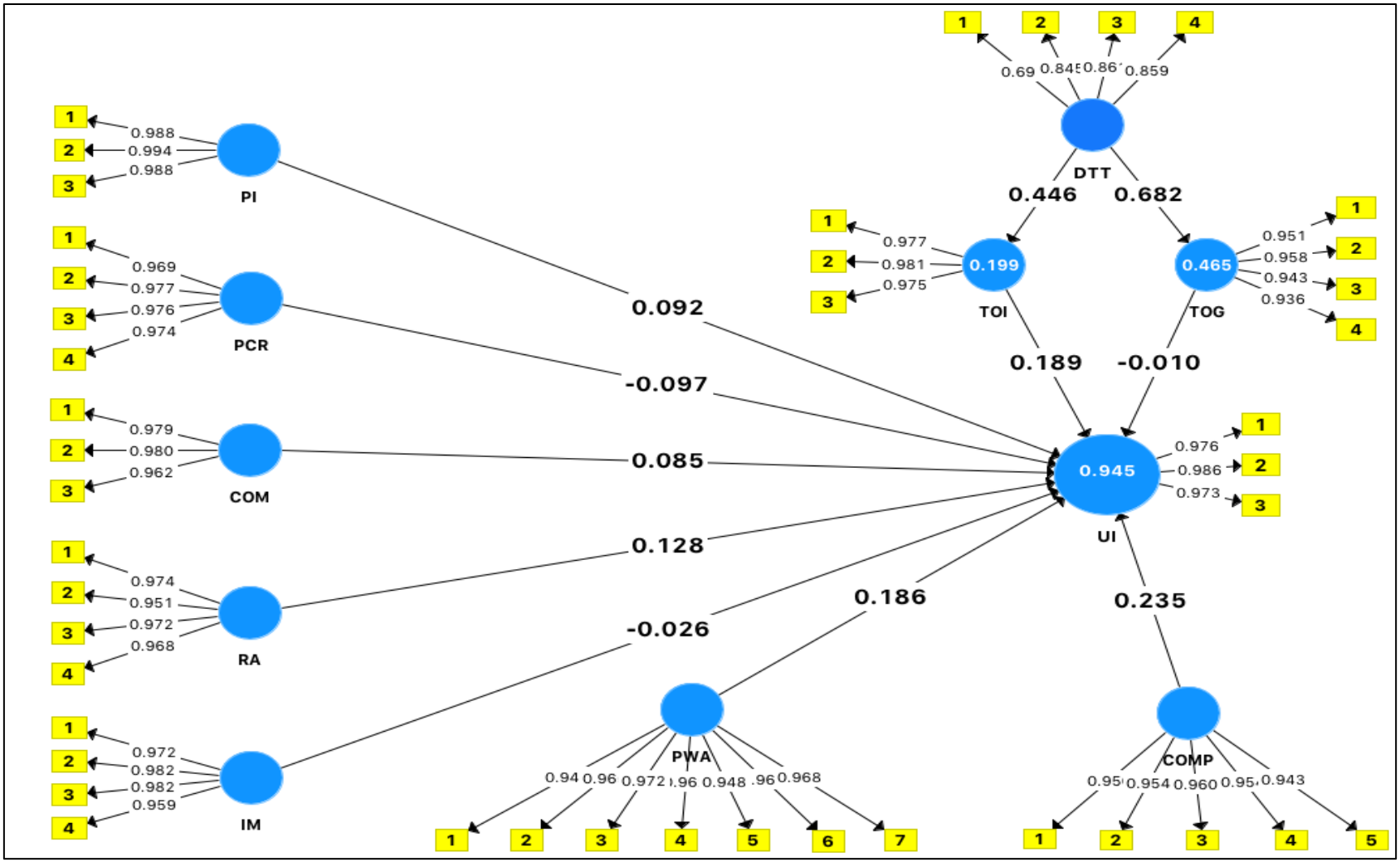


Figure 5.2. Basic Path Analysis

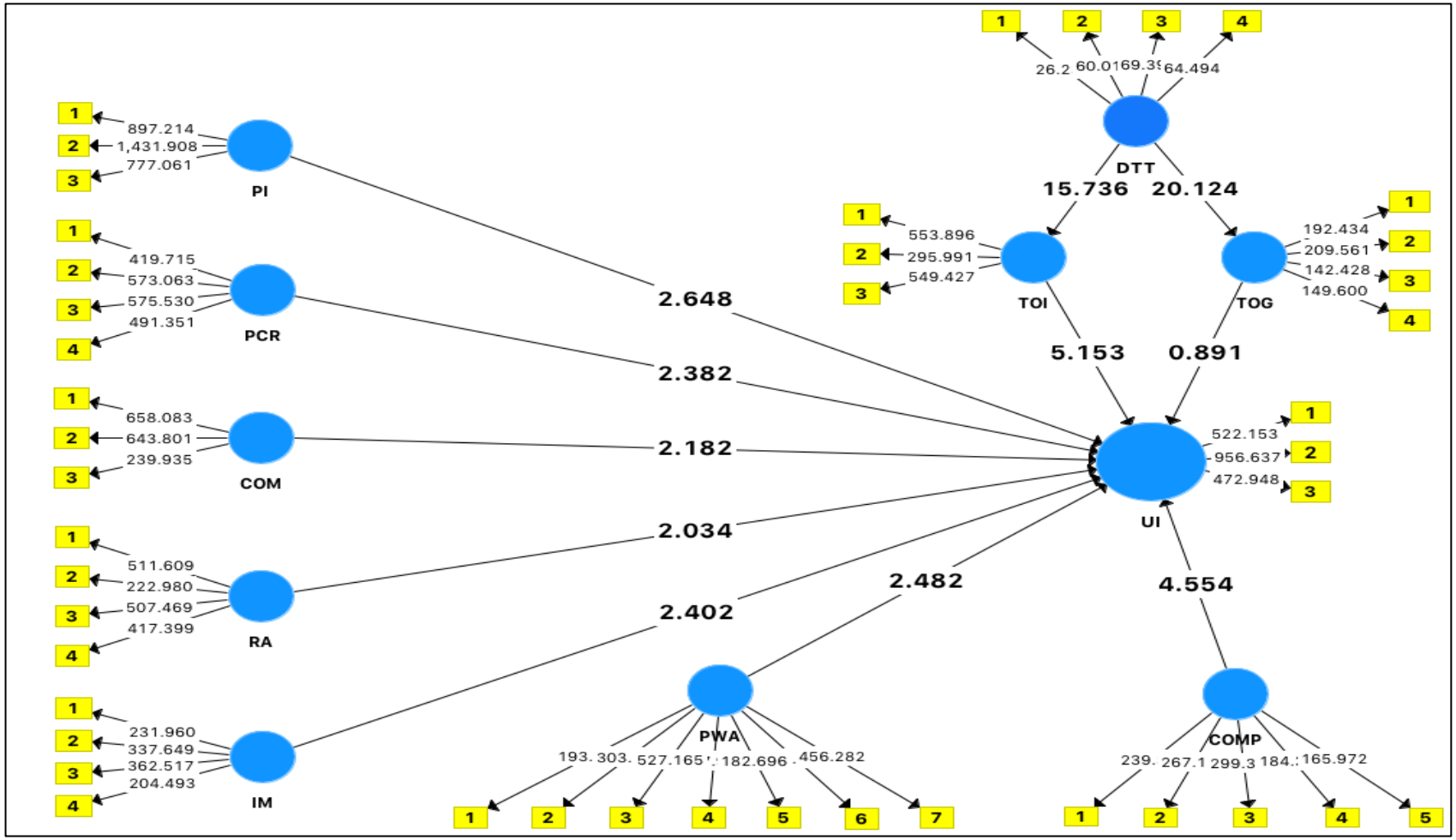


Figure 5.3. Bootstrap Analysis of the model

Hypotheses Testing

Testing a hypothesis is a statistical process applied to a sample data in order to determine whether or not the proposed perception about the targeted population is true (Gravetter & Wallnau, 2009). Applying the aforementioned criterion resulted in the evaluation of the proposed hypotheses (see figure 5.4 & figure 5.5). Overall, 9 of the 11 hypotheses were supported by the outcomes of the model evaluation with some disparities amongst them (see table 5.16). Next are provided the interpretations of those hypotheses in terms of whether they were accepted or rejected by analysis.

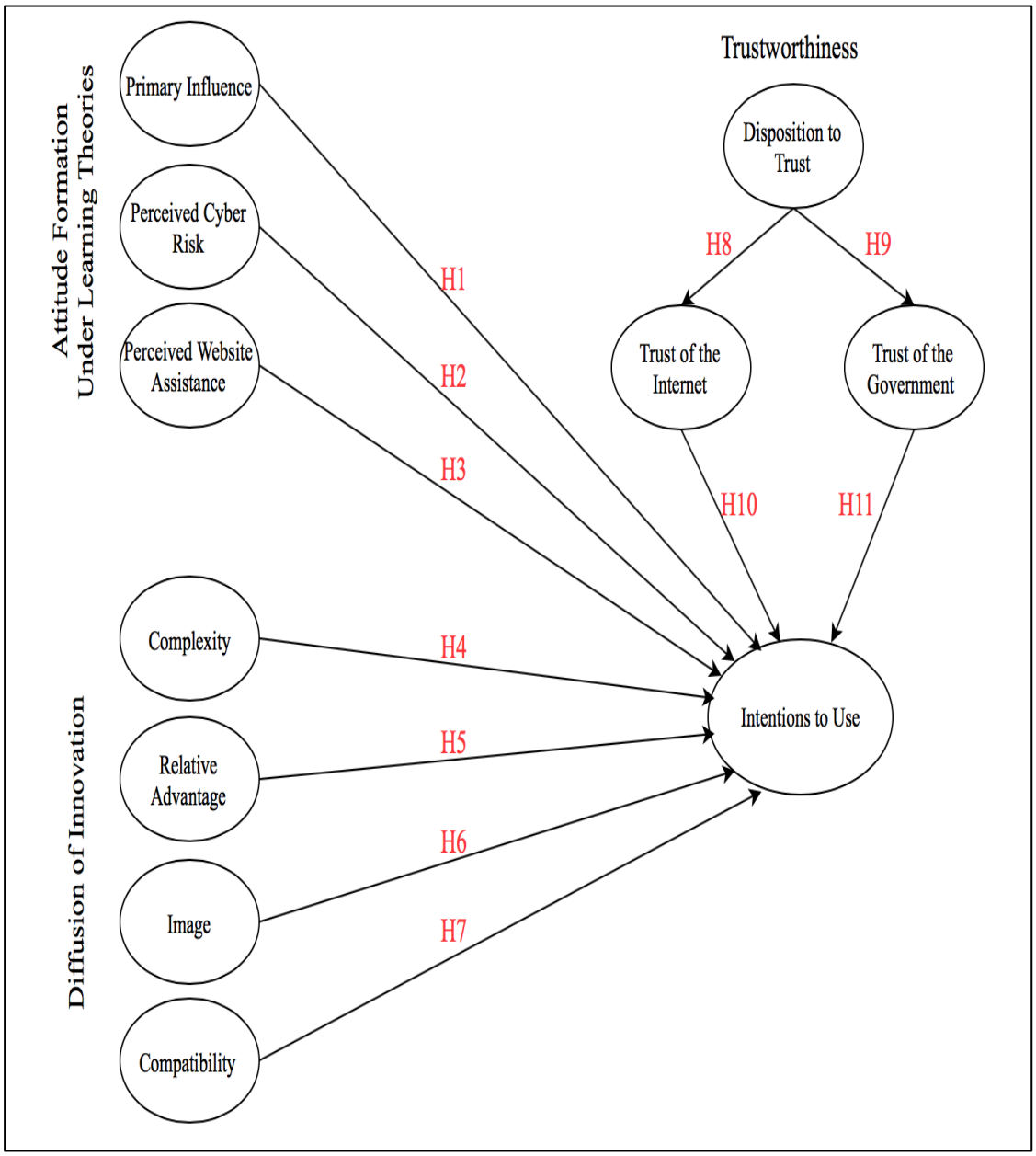


Figure 5.4. Proposed Model Hypotheses

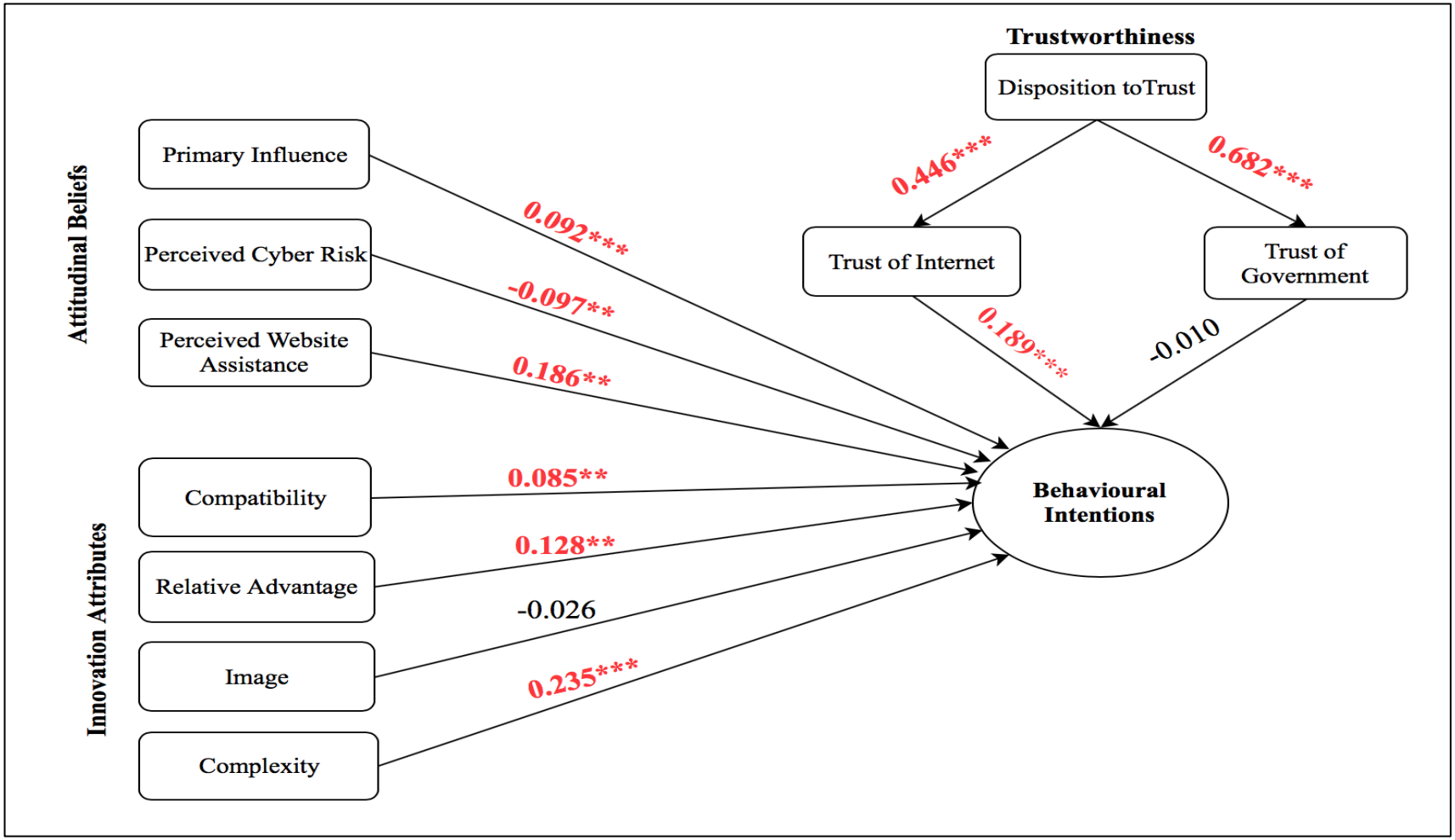


Figure 5.5. Structural Model Evaluation

*Significant at 0.1 level
**Significant at 0.05 level
***Significant at 0.01 level

Hypothesis 1 predicted that social influence would positively relate to older adults' intentions to use the MOI e-Portal. This hypothesis was supported by analysis (significant at 0.05 level), indicating more probability for an older adult to use The MOI e-Portal by the social influence of family, friends or colleagues (*t*-value **2.648).**

Hypothesis 2 predicted that perceived cyber risk would negatively relate to older adults' intentions to use the MOI e-Portal. This hypothesis was supported by analysis (significant at 0.01 level), indicating less probability for an older adult to use The MOI e-Portal as a result of being negatively influenced by the perceived cyber risk (*t*-value **2.382**).

Hypothesis 3 predicted that perceived website assistance will positively relate to older adults' intentions toward using The MOI e-Portal. This hypothesis was supported by analysis (significant at 0.05 level), indicating greater inclination for an older adult to use The MOI e-Portal when he/she perceives a more reliable website assistance (*t*-value **2.482**).

Hypothesis 4 predicted that greater levels of perceived compatibility would positively relate to older adults' intentions to use The MOI e-Portal. This hypothesis was also supported by analysis (significant at 0.05 level), indicating the existence of a positive association between compatibility and behavioural intention to use The MOI e-Portal (*t*-value **2.182).**

Hypothesis 5 predicted that greater levels of perceived relative advantage would positively relate to older adults' intentions to use The MOI e-Portal. This hypothesis was also supported by analysis (significant at 0.1 level), indicating greater inclination for an older adult to use The MOI e-Portal when he/she perceives relative advantage by using the website (*t*-value **2.034).**

Hypothesis 6 predicted that lower levels of perceived complexity (or higher ease of use) would positively relate to older adults' intentions to use The MOI e-Portal. This proposition was supported by analysis (significant at 0.01 level), meaning that the less complex the website, the more likelihood for older adults to adopt and use The MOI e-Portal (*t*-value **4.554).**

Hypothesis 7 predicted that greater levels of perceived image would positively relate to older adults' intentions to use The MOI e-Portal. Unlike the proposition, this hypothesis showed a negative correlation; thus was deemed unsupported (*t*-value **2.402).**

Hypothesis 8 predicted that trust of the Internet would positively relate to older adults' intentions to use The MOI e-Portal. This proposition was supported by analysis (significant at 0.01 level), indicating that when trust of Internet increases, the likelihood to use The MOI e-Portal by older adults increases too (*t*-value **5.153).**

Hypothesis 9 predicted that trust of the government would positively relate to older adults'

intentions to use The MOI e-Portal. This hypothesis however showed no statistical significance (*t*-value **0.891)**.

Hypothesis 10 predicted that disposition to trust would positively relate to older adults' trust of the Internet. This proposition was supported by analysis (significant at 0.01 level), implying that the more disposition to trust of an older adult, the more trust they would have in the Internet (*t*-value **15.736)**.

Hypothesis 11 predicted that disposition to trust would positively relate to older adults' trust of the government. This proposition was supported by analysis (significant at 0.01 level), implying that the more disposition to trust of an older adult, the more trust they would have in the government (*t*-value **20.124)**.

Finally, when comparing these results to the results of the pilot phase, three hypotheses were supported by analysis in the final phase test that were previously unsupported in the pilot phase, namely Primary Influence (PI), Perceived Cyber Risk (PCR) and Relative advantage (RA). However, Image (IM) and Trust of The Government (TOG) were not supported neither in the pilot phase nor in the final phase. The following tables summarises the final findings with regards to hypotheses testing.

Table 5.19. Hypothesis testing – All participants (n=703)

	Construct	Coefficient	*t*-value	*p*-value	Significance	Support
H1	Primary Influence -> UI	0.092	2.648	0.008	***+	Yes
H2	Perceived Cyber Risk -> UI	-0.097	2.382	0.018	**–	Yes
H3	Perceived Website Assistance -> UI	0.186	2.482	0.013	**+	Yes
H4	Compatibility -> UI	0.085	2.182	0.030	**+	Yes
H5	Relative advantage -> UI	0.128	2.034	0.042	**+	Yes
H6	Image -> UI	-0.026	2.402	0.015		**No**
H7	Complexity -> UI	0.235	4.554	0.000	***+	Yes
H8	Disposition to trust -> TOI	0.446	15.736	0.000	***+	Yes
H9	Disposition to trust -> TOG	0.682	20.124	0.000	***+	Yes
H10	Trust of the Internet -> UI	0.189	5.153	0.000	***+	Yes
H11	Trust of the government -> UI	-0.010	0.891	0.353		**No**

***R²* = 0.945**

*P** <0.1 *P*** <0.05 *P**** <0.01
+ Positive effect
- Negative effect

Table 5.20. Summary of Hypotheses Testing Results
Final Phase - All participants (n=703)

HN	Hypotheses Proposed	Coefficients	Outcome
H1	Social influence (primary influence) will positively relate to users' intentions to use The MOI e-Portal.	0.092	Supported
H2	Perceived cyber risk will negatively relate to users' intentions to use The MOI e-Portal.	-0.097	Supported
H3	Perceived website assistance will positively relate to users' intentions to use The MOI e-Portal.	0.186	Supported
H4	Lower levels of perceived complexity will positively relate to intention to use The MOI e-Portal.	0.235	Supported
H5	Greater levels of perceived relative advantage will positively relate to intention to use The MOI e-Portal.	0.128	Supported
H6	Greater levels of perceived image will positively relate to intention to use The MOI e-Portal.	-0.026	**Not Supported**
H7	Greater levels of perceived compatibility will positively relate to intention to use The MOI e-Portal.	0.085	Supported
H8	Disposition to trust will positively relate to trust of the Internet (TOI).	0.446	Supported
H9	Disposition to trust will positively relate to trust of the government (TOG).	0.682	Supported
H10	Trust of the Internet (TOI) will positively relate to the intention to use The MOI e-Portal.	0.189	Supported
H11	Trust of the government (TOG) will positively relate to the intention to use The MOI e-Portal.	-0.010	**Not Supported**

5.5.5.1 Sub-Groups Analysis

The previous section provided the structural model analysis of all participants. Therefore, the results presented above represent the final findings of research hypotheses, which correspond to the second research question, which was designed to test the theories applied in the model. Having achieved that, it is appropriate at this stage to provide more detailed analysis by conducting "sub-groups analysis" in terms of age and gender. In terms of this research, the sub-groups analysis requires dividing the category of age and gender into smaller sub-categories in order to check whether different results to what has already been found will come up or not. Accordingly, age will be re-categorised into two groups; pre-seniors within the age band 50-59, and young-old & older-old (60+). This was based on the notion that when considering adoption, older adults are not identical groups; rather, they can be classified into three categories form youngest to oldest; pre-senior, young-old and older-old (Lee et al. 2011 & Niehaves & Plattfaut, 2014). In this research, the categories of the young-old and older-old were combined into one group (60+) because the number of the older-old participants was insufficient and impractical for conducting a separate model analysis (less than 10). Complete results are next presented.

Pre-senior participants (50-59)

Carrying out a structure model analysis of the dataset of pre-senior participants who are between the ages of 50 and 59 years old resulted in five supported hypotheses as depicted in table 5.18. Complexity, disposition to trust and trust of the Internet all showed a very strong correlation with the older adults' intentions to use the MOI e-portal whereas the factor of perceived website assistance exhibited a relatively lower influence. In contrast, although the factors of primary influence, perceived cyber risk, compatibility and relative advantage showed significance when all participants were included in the analysis, for this group of pre-senior participants, these factors were insignificant. This might be an indication of more independence and Internet using skills that pre-seniors enjoy compared to older groups, especially with regards to the factors of primary influence, perceived cyber risk. Finally, approximately 93% of the variability within the pre-seniors' intentions to use the e-government services (MOI e-Portal) were explianed by the model (R^2 = 0.930 & adjusted R^2 = 0.928).

Table 5.21. Hypothesis testing – Pre-seniors (50-59) (n=327)

	Construct	Coefficient	*t*-value	*p*-value	Significance	Support
H1	Primary Influence -> UI	0.078	1.598	0.111		**No**
H2	Perceived Cyber Risk -> UI	-0.121	1.482	0.139		**No**
H3	Perceived Website Assistance -> UI	0.255	2.024	0.044	**+	Yes
H4	Compatibility -> UI	0.061	0.838	0.403		**No**
H5	Relative advantage -> UI	0.099	1.057	0.291		**No**
H6	Image -> UI	-0.024	1.437	0.151		**No**
H7	Complexity -> UI	0.201	3.621	0.000	***+	Yes
H8	Disposition to trust -> TOI	0.400	8.773	0.000	***+	Yes
H9	Disposition to trust -> TOG	0.524	7.794	0.000	***+	Yes
H10	Trust of the Internet -> UI	0.188	3.877	0.000	***+	Yes
H11	Trust of the government -> UI	0.005	0.244	0.807		**No**

R^2 = 0.930

*P** <0.1 *P*** <0.05 *P**** <0.01
+ Positive effect
- Negative effect

Young-old & Older-old (60+) participants (60+)

The model analysis showed that out of 11 proposed hypotheses, eight were supported with variations among them (see table 5.19). Similar to the pre-seniors, the factors of complexity, disposition to trust and trust of the Internet all were strongly correlated with the older adults' intentions to use the MOI e-portal. It is an indication of the importance of these factors for all age groups. On the other hand, unlike the pre-senior group, the factors of primary influence, perceived cyber risk, compatibility and relative advantage showed some level of significance in terms of their influence on the young-old and older-old (60+) intentions to adopt MOI e-portal. This implies that as age increases, the influence of family, friends and relatives increases. It also implies that the perceptions of the online risks have

actual influence on the young-old and older-old behaviour. Further, for older participants to adopt the MOI e-portal, compatibility and relative advantage are important factors they consider. Finally, approximately 92% of the variability within the young-old and older-old intentions to use the e-government services (MOI e-Portal) were explianed by the model (R^2 = 0.929 & adjusted R^2 = 0.928).

Table 5.22. Hypothesis testing – Young-old & Older-old (60+) (n=376)

	Construct	Coefficient	*t*-value	*p*-value	Significance	Support
H1	Primary Influence -> UI	0.110	2.492	0.013	**+	Yes
H2	Perceived Cyber Risk -> UI	-0.078	1.775	0.077	*–	Yes
H3	Perceived Website Assistance -> UI	0.131	1.375	0.170		**No**
H4	Compatibility -> UI	0.099	1.911	0.057	*+	Yes
H5	Relative advantage -> UI	0.147	1.721	0.086	*+	Yes
H6	Image -> UI	-0.030	1.779	0.076		**No**
H7	Complexity -> UI	0.267	3.398	0.001	***+	Yes
H8	Disposition to trust -> TOI	0.356	8.805	0.000	***+	Yes
H9	Disposition to trust -> TOG	0.697	19.799	0.000	***+	Yes
H10	Trust of the Internet -> UI	0.182	3.205	0.001	***+	Yes
H11	Trust of the government -> UI	-0.020	1.248	0.213		**No**

***R²* = 0.929**

*P** <0.1 *P*** <0.05 *P**** <0.01
+ Positive effect
- Negative effect

Female Participants

The analysis of the theoretical model in terms of the female participants resulted in five supported hypotheses as shown in table 5.20. All of the supported hypotheses correlated strongly with the dependent variable intentions to use the MOI e-portal. The factor trust of the Internet however was the only supported factor to correlate with a coefficient value of less than 0.2. Results clearly indicate the significant role that primary influence, complexity, disposition to trust and trust of the Internet play as decisive factors in terms of whether female older adults would adopt the MOI e-portal or not. Finally, approximately 91% of the variability within the female older adults' intentions to use the e-government services (MOI e-Portal) were explianed by the model (R^2 = 0.911 & adjusted R^2 = 0.906).

Table 5.23. Hypothesis testing – Female Participants (n=174)

	Construct	Coefficient	*t*-value	*p*-value	Significance	Support
H1	Primary Influence -> UI	0.233	2.804	0.005	***+	Yes
H2	Perceived Cyber Risk -> UI	-0.105	1.581	0.115		**No**
H3	Perceived Website Assistance -> UI	0.078	0.551	0.582		**No**
H4	Compatibility -> UI	0.085	0.655	0.513		**No**
H5	Relative advantage -> UI	0.050	0.342	0.732		**No**
H6	Image -> UI	-0.014	0.510	0.610		**No**
H7	Complexity -> UI	0.325	2.761	0.006	***+	Yes
H8	Disposition to trust -> TOI	0.210	2.841	0.005	***+	Yes
H9	Disposition to trust -> TOG	0.573	7.446	0.000	***+	Yes
H10	Trust of the Internet -> UI	0.144	1.909	0.057	*+	Yes
H11	Trust of the government -> UI	-0.035	1.363	0.173		**No**

R^2 = 0.911

*P** <0.1 *P*** <0.05 *P**** <0.01
+ Positive effect
- Negative effect

Male Participants

As for the male participants, the analysis showed that eight hypotheses were supported as depicted in table 5.21. When compared to results of the female participants, the level of similarity seems to be less than 50%. For example, the factor of primary influence showed high significance in terms of the female group whereas for the male group it was not significant what so ever. Further, it was the other way around with regards to the factor of perceived website assistance where it appeared to have a strong influence on the male older adults' intentions to adopt the MOI e-portal, but had insignificant influence on the female elderlies. Compatibility, relative advantage and perceived cyber risk are also all factors of significance in terms of the male participants. Finally, approximately 95% of the variability within the male older adults' intentions to use the e-government services (MOI e-Portal) were explianed by the model (R^2 = 0.950 & adjusted R^2 = 0.949).

Table 5.24. Hypothesis testing – Male Participants (n=529)

	Construct	Coefficient	*t*-value	*p*-value	Significance	Support
H1	Primary Influence -> UI	0.021	0.797	0.426		**No**
H2	Perceived Cyber Risk -> UI	-0.063	1.906	0.057	*+	Yes
H3	Perceived Website Assistance -> UI	0.258	4.479	0.000	***+	Yes
H4	Compatibility -> UI	0.092	2.326	0.020	**+	Yes
H5	Relative advantage -> UI	0.172	2.522	0.012	**+	Yes
H6	Image -> UI	-0.022	2.019	0.044		**No**
H7	Complexity -> UI	0.156	3.971	0.000	***+	Yes
H8	Disposition to trust -> TOI	0.529	18.490	0.000	***+	Yes
H9	Disposition to trust -> TOG	0.718	20.493	0.000	***+	Yes
H10	Trust of the Internet -> UI	0.235	6.218	0.000	***+	Yes
H11	Trust of the government -> UI	0.010	0.754	0.451		**No**

R^2 = 0.950

*P** <0.1 *P*** <0.05 *P**** <0.01
+ Positive effect
- Negative effect

In conclusion, the sub-groups models analyses showed that behavioural intentions to adopt e-government services by different age groups and gender are not equally influenced by the proposed factors. However, what is noticeable is that for all the groups, the factors of complexity, disposition to trust and trust of the Internet are heavy influencers. The following table presents a summarised comparison of all significant results discussed previously. For more details on the sub-groups analysis results, refer to appendix 5-2.

Table 5.25. Summary of the Significant Results

Construct	All Participants (n=703)	Pre-seniors (50-59) (n=327)	Young-old & Older-old (60+) (n=376)	Female Participants (n=174)	Male Participants (n=529)
	R^2 = 0.945	R^2 = 0.930	R^2 = 0.929	R^2 = 0.911	R^2 = 0.950
Primary Influence -> UI	***+		**+	***+	
Perceived Cyber Risk -> UI	**–		*–		*+
Perceived Website Assistance -> UI	**+	**+			***+
Compatibility -> UI	**+		*+		**+
Relative advantage -> UI	**+		*+		**+
Image -> UI					
Complexity -> UI	***+	***+	***+	***+	***+
Disposition to trust -> TOI	***+	***+	***+	***+	***+
Disposition to trust -> TOG	***+	***+	***+	***+	***+
Trust of the Internet -> UI	***+	***+	***+	*+	***+
Trust of the government -> UI					

*P** <0.1 *P*** <0.05 *P**** <0.01
+ Positive effect
- Negative effect

5.6 Chapter Summary

Chapter five began with a description of the sampling design of the final phase in terms of the methods used for data collection. Then response rate of the final survey was calculated and interpreted. Thereafter, potential sampling errors in terms of sampling, coverage, measurements and non-response errors were explained. The chapter then commenced presenting the findings of the final data analyses in terms of socio-demographic variables, descriptive statistics and structural model analysis. In general, this research has two levels of analysis which cover the key areas highlighted in the research questions. The first level concerns determining the association between demographics variables and Internet adoption where as the second level concerns the analysis of the structural model, leading to instrument validation results, constructs measurements reliability and hypotheses testing.

Chapter 6

Evaluation & Discussion

6.0 Introduction

Having offered the major data analysis results of this research, this chapter evaluates and discusses these results. It begins with section 6.1 where definitions of different types of evaluations are provided. This section also includes a demonstration of the existing methods for evaluation data collection where the used method is specified and justified. An evaluation of the views of some participants with regards to the research findings as well as the impact this research might had on them is then offered (sections 6.2 & 6.3). This is followed by section 6.4, which provides a major discussion of the research findings in terms of older adults, digital divides, and e-government services. In section 6.5, a reflective discussion is provided in which it discusses some thoughts, feelings and opinions of the researcher. Finally, section 6.6 concludes the chapter and introduces the following chapter.

6.1 Evaluation (Validation)

When a study that is based upon a theoretical framework presents its findings and results after having interpreted and analysed primary data, it is vital to validate and establish credibility for such findings (Panneerselvam, 2004). The process of results validation is widely known as the 'evaluation' process where evaluation is defined as "the process of determining the merit, worth or value of something, or the product of that process" (Stern, 2005 p.xxvi). In other words, evaluation is concerned with systematically recognising and assessing the impacts generated by programs or products (Jupp, 2006). Further, evaluation can be categorised into four types:

- Front-end evaluation: This type takes place in a very early stage of initiating a program where decisions are made by providing input prior to the planning phase. The main purpose of this phase of evaluation is to acquire and determine general background information about an audience's beliefs, questions, general knowledge, experiences, learning styles and worries regarding a subject or theme. As far as this research is concerned, this type of evaluation was partially undertaken where a better understanding of the research and audience had been formed by the content validity questionnaire and the pilot phase (Friedman, 2008).

- Formative evaluation: This type assists throughout the design and development phase by delivering information to advance the project (Trochim & Donnelly, 2008). While a project or a program is under development, formative evaluation processes basically provide information and knowledge on how that project can be enhanced. This explains why formative evaluation sometimes is called process

evaluation as it involves examining methods, inputs and outputs for the sake of enhancing the ultimate design or implementation (Friedman, 2008).

- Remedial evaluation: This type is meant to evaluate a project once it is complete. In certain circumstances, when a project is complete and underway there might be a need to undertake corrective measures. Therefore, this evaluation can be perceived as the appraisal of how all the diverse segments of a project perform together as a whole. Further, remedial and formative evaluation have something in common in which both types aim to advance educational efficacy and assure successful accomplishment of objectives (Friedman, 2008).

- Summative evaluation. This type evaluates the results or impacts of already established projects. Summative evaluation is conducted in order to assess and determine the degree to which already reached outcome of a project has been successful (Dane, 1990). The aspects to be assessed should always be judged against project goals and objectives. The output of a summative evaluation expresses a sense of conclusiveness where reliance on the outcomes suggests the success of a project (Rubin & Babbie, 2011).

Having considered the four types of research evaluation, summative evaluation is the type to be conducted. As this study has already established some outcomes, summative evaluation is best suited at this stage since the outcomes will now be evaluated against the research goals and objectives. For readers' information, this evaluation consists of two main sections in which the first section concerns the opinions of participants with regards to research results and the second section attempts to determine the possible influence the research has made on the behaviours and attitudes of the participants towards the MOI e-portal.

As mentioned earlier in this research, a quantitative approach has been applied to collect and analyse data in which survey questionnaires were the main data collection method and math and statistics were the main analysis approach. However, in order to evaluate and validate the findings of this research, qualitative approaches were adopted because they offer a better and deeper understanding. Qualitative approaches are popular for complicated phenomenon as they give researchers the ability to deeply analyse collected data by dealing with words and the meaning within words and data (Myers, 1997). Further, qualitative approaches offer many well-recognised data collection instruments for evaluation purposes that researchers can select from. Next is an overview of some of the most widespread methods, which are the think-aloud protocols, heuristic methods, cognitive walkthrough, observations and interviews.

First**, *think-aloud protocols*** (or thinking aloud) are usually applied to test the usability of a product, and usually occur at the stage of design and development (Lewis, 1982). This method requests potential users to conduct a series of specified tasks with the product under-examination seeking verbal expressions of thoughts they might have whilst completing the tasks. The job of the observer then is to makes notes of such 'loudly'

expressed thoughts (ibid). Second is ***heuristic evaluation***, which also normally used to assess the usability of a product (e.g. interface, website, documents). Heuristic methods are basically evaluations carried out by a group of appraisers (usually a small group) against a pre-defined usability guideline or 'heuristics' (Nielsen 1994). This method requires the appraisers to have extensive experience in usability and preferably in domains as well (Kantner & Rosenbaum, 1997).

The third method identified is the ***cognitive walkthrough*** where evaluative data is gathered and analysed from systems users in order to determine level of tasks difficulty (Polson et al., 1992). While heuristic evaluation is superior because it discovers usability aspects that contribute to the dissatisfaction of users, cognitive walkthrough is preferable for detecting system learnability issues. Cognitive walkthrough evaluation has the ability to detect severer issues; thus, it is an appropriate approach for evaluating "mission-critical systems" (Khajouei et al., 2017). The main criticism of this technique is the time it consumes. This is due to the step-by-step approach it is based upon, as well as, the expertise it requires from the evaluators. Further, when compared to heuristic evaluation, "cognitive walkthrough presents the particularity of missing general and recurrent problems" (Huart et al., 2004, p.192). The fourth technique for evaluation data collection is ***observation***. It is a learning process by which observers can form an understanding of a certain situation using their five senses (Kawulich, 2005). Observations take place through the involvement of the observer in the day-to-day activities of the people under observation in the natural setting. This technique enables observers to perceive nonverbal manifestation of feelings, establish a firm comprehension of how, why, where and when interactions among participants take place, and grasp the time needed to complete various activities (ibid).

The last type of evaluation data collection (which this study has used) to point out is ***interviews***. Interviews are widely classified into three fundamental categories: structured, unstructured and semi-structured (Gill et al. 2008). *Structured interviews* are basically verbally delivered surveys, in which they consist of a list of reprogrammed questions. This type usually doesn't have a scope for extra questions to be asked when an issue that requires further elaboration arises. Therefore, structured interviews are not of much aid when deep understanding of a phenomenon is pursued. Contrawise, *unstructured interviews* are typically conducted with no predetermined list of questions and no defined scope. The progress of such interviews is usually determined based on the enthusiasm and cooperation of the participants, which is something not easy to achieve given the fact that unstructured interviews are unorganised, confusing and time-consuming (ibid).

The third type of interviews is *semi-structured interviews* that are designed to help with discovering what certain people experience and feel about something that researchers are interested in. They are simply conversations about a certain topic with people whom are somewhat involved in that topic. Although it's required for the researcher to prepare a set of key questions prior to the interviews, unlike structured interviews, semi-structured interviews are not necessarily limited to those questions, and the conversations can expand

to cover more areas in order to find out how the participants feel about something. Moreover, semi-structured interviews can vary considerably between participants on the same topic, which offers a scope for interview 'personalization' (Miles & Gilbert, 2005). Given the aforementioned flexibility and advantages of this approach, this study used it for evaluation. The following table (6.1) summarises the aforementioned evaluation data collection methods.

Table 6.1. A comparison of four main Evaluation data collection methods

	Definition	Pros	Cons
Think-aloud protocols	It means conducting a series of specified tasks with the product under-examination, and ask them to verbally express whatever thoughts they have whilst completing the tasks	• Good for usability tests • Effective with finding issues in a user interface • Allows gathering a huge amount of data from small number of participants	• Unnatural for some participants • Acquired data could be difficult to analyse • Participants can rationalise & deform data
Heuristic	Evaluations carried out by a group of appraisers (usually a small group) against a pre-defined usability guidelines or "heuristics"	• Good for usability tests • Effective with finding issues in a user interface • Can be used to spot usability problems at early stages of the design life.	• Requires experienced participants which is usually costly • Loosely structured which consumes time & effort
Cognitive walkthrough	A usability inspection method used for assessing a system design in terms of simplicity of learning and usability issues	• Enable very early detection of system faults • Can be used with inexperienced users • Favourable for assessing mission-critical systems	• Time consuming • Unfavourable for large projects • Requires assessors to have extensive experience in usability
Observation	It is a learning process by which observers can form an understanding of a certain situation using their five senses	• Enables richly comprehensive description of behaviours & situations • Provides opportunities for observing unplanned events • Enhances the quality of data collection & analysis • Enables the forming of research questions or hypotheses	• High subjectivity • Data collected may not be representative of the culture • Time consuming Highly dependent on the role of the observer in these observations
Interviews	**Structured** Verbally delivered surveys, in which they consist of a list of reprogrammed questions.	• Ensures participants fully understand the questions • Easier to manage because of its predesigned nature • Enables larger samples "representative sample"	• Doesn't allow deep understanding of the topic • No scope for extra questions when an issue requires further elaboration

	Unstructured Conducted with no predetermined list of questions and no defined scope	• Offers an in-depth understanding of the participants • Free style and no limitation of pre-programmed questions • Informality of the interviews encourages participants to be more direct & sincere	• Highly subjective • Time and money consuming • The unstructured nature might lead to less or irrelevant directions from the topic
	Semi-structured Conversations about a certain topic with people whom are somewhat involved in that topic	• Flexible conversation • Helps exploring the feelings of participants about something • Informality of the interviews encourages participants to be more direct & sincere	• Relatively time consuming • Difficult to engage a large sample • Lower level of sample representation

Accordingly, the researcher conducted semi-structured interviews with 10 participants (all of whom had taken part in the final survey). The number of semi-structured interviews was chosen in order to establish a sense of alignment with the number of content validity expert panel, which had been conducted during the construction of the survey. It is important for the chosen participants to have had a particular experience with regard to the use of MOI e-portal or have played a particular part in it. It is also important to choose individuals who are likely to provide a particular perspective on the results of the research (U.S. Department of Health & Human Services, 2015).

The principal researcher had conducted the evaluation interviews by telephone. Telephone interaction with participants is a method that is used to "discerning opinion, and may also be used as a follow up of questionnaire" (Kothari, 2004, p. 8). Interviews were carried out between the periods of 6th and 18th of September in 2017 over the phone with participants from Hail city where the entire study and data collection took place. Whilst conducting interviews, the researcher kept in mind the aim of this study. Therefore, the evaluation questions were directly linked to that aim by discussing whether the participants agree or don't agree with the generated results of hypotheses testing and model analysis. Participants were then given the opportunity to express any idea they desire، which has considerably helped acquiring more information and better understanding of some areas previously covered in the survey. Next are illustrations of each hypothesis and what participants thought about the outcomes in relation to those hypotheses (supported or not supported).

6.2 Evaluation of Outcomes

Hypothesis 1: Social influence (primary influence) will positively relate to users' intentions to use The MOI e-Portal. (Supported by analysis)

All of the participants agreed with the above statement. They revealed that relatives and

friends made considerable impact on their decision with regards to the use of The MOI e-Portal. Further, three participants pointed out the importance of peers (relatives or friends of the same generation and social strata) encouragement to use such services. One participant commented,

"*When someone as old as I am tells me that he carries out online governmental services himself, I feel I should do it myself too*".

However, four of the interviewees said they only get encouraged by younger generations to use the MOI e-Portal (e.g. their sons). One commented,

" I spend most of my time with people who are closest to my age and also closest to my interests, and I do not recall we have ever talked about online governmental services nor we have encouraged one another to use them at any occasion".

- **Hypothesis 2: Perceived cyber risk will negatively relate to users' intentions to use The MOI e-Portal. (Supported by analysis)**

Nine out of ten interviewees agreed with the above statement. Further, the majority of the people I have spoken with (7 out of 10) said that they sometimes worry about the security of the online environment in general. This apprehension even increases when conducting official online governmental services because of the sensitive nature and seriousness of such services. However, they revealed that it is not because they do not trust the services provider – in this case, the government - it is only because what they hear every now and then about Internet security breaches and hacking incidents. One commented,

"What if someone hacks my personal e-government account and starts misusing provided services, this might put me at risk and result in troubles with the government".

Another also commented,

"*My son's email was hacked, recently and he lost valuable information, this could happen to anyone on the Internet, I should be cautious*".

On the other hand, three participants think that online environment is much more reliable nowadays than ever before, in particular, government web portals where they believe extreme security measures take place. It's worthwhile to note that six out of the seven participants who worry about the reliability of the online environment have never made an online purchase in contrast to the other three participants who all have made at least one online purchase.

- **Hypothesis 3: Perceived website assistance will positively relate to users' intentions to use The MOI e-Portal. (Supported by analysis)**

All interviewees agreed with the above statement. The MOI e-portal offers a variety of methods by which users could acquire information and technical assistance when need be. These methods include, frequently asked questions section, phone assistance, social

networks assistance (Twitter & Facebook), and finally the electronic messages and documents system (MOI helpdesk). However, three participants revealed that when facing any problem with regard to the use of the portal or when they need more information about services, they prefer to go physically to the relevant governmental organisation and inform the staff about what they need in order to get it sorted. Their justification of not attempting to obtain assistance via any of the aforementioned methods is that they think it is a serious matter; thus, it is much better to speak to officials face-to-face to avoid "errors or misunderstandings". Although they agree that such assistance delivery methods do save time & effort; however, this value is not comparable to the value of meeting in person with government representatives, and rest assure that the needed service is being completely provided, and perhaps taking more information about other services.

- **Hypothesis 4: Lower levels of perceived complexity will positively relate to intention to use The MOI e-Portal. (Supported by analysis)**

All interviewees agreed with the above statement. The majority of them believe that any service provided online whether it is governmental or not, has some degree of complexity. As far as the MOI e-portal is concerned, half of the participants view the portal as a complicated website while the other half placed it under the category of 'acceptable level of complexity'. Five participants (two of which are not Internet adopters) revealed that they do not log onto their accounts and start navigating the portal without the help of others (e.g. sons, services offices). There were also complaints regarding the portal layout clarity in which some participants think the services provided online are not easy to follow and locate within the portal. This has created navigation difficulties and inflexibilities for some users. One commented,

"I feel lost when using the portal, too much information and too much services and icons on one page. It was not easy for me to reach the service I was looking for. That's why I reach out for assistance every time I need to carry out a service via the MIO e-portal".

- **Hypothesis 5: Greater levels of perceived relative advantage will positively relate to intention to use The MOI e-Portal. (Supported by analysis)**

Seven interviewees agreed with the above statement. According to them, the MOI e-portal has indeed offered relative advantages over the old traditional ways of interacting with the government. Saving time and effort as well as day-and-night availability of services have been strongly stressed by many interviewees as key advantages of online service provision. However, three participants think that online interaction with MOI e-portal does not give citizens more control over interaction. In fact, one of them commented,

"Online interaction with the government actually gives the government itself more control as all the services are pre-designed by it".

- **Hypothesis 6: Greater levels of perceived image will positively relate to intention to use The MOI e-Portal. (Not supported by analysis)**

Nine participants disagreed with the above statement whereas only one participant thinks it's correct. The majority of interviewees did not see any connection between an individual's status or image and whether he or she uses the MOI e-portal services. However, only one interviewee thinks using online services provided by the government might indicate one's social status (high profile).

- **Hypothesis 7: Greater levels of perceived compatibility will positively relate to intention to use The MOI e-Portal. (Supported by analysis)**

Six participants agreed with the above statement whereas four participants didn't agree. Further, three participants commented that changing the way of interaction with the government is not favourable for people in their age as they have used to interact with the government in a certain way (physically) for so many years. A participant commented,

"After so many years of interacting with the government in a certain way, it is difficult to embrace a different behaviour in this regards. The conventional means that marked out the interaction processes between citizens and government are much more preferable to me".

It was also noticeable that as the age of interviewees ascends, the likeability of the online interaction with government descends. Further, two participants pointed out the importance of Internet connection speed, which in its current state - in their opinion – undermines government efforts toward digitised society. It has turned out that they meant cellular & DSL Internet connection.

- **Hypothesis 8: Disposition to trust will positively relate to trust of the Internet (TOI). (Supported by analysis)**

Seven participants agreed with the above statement whereas three participants thought trusting the Internet is completely different and unrelated to trusting people. One of the first group commented,

"In general, I believe that people are good and their intentions to one another are also good. I can say with confidence that the majority of people are decent; and therefore I have a great faith in humanity".

Then he commented on how he thinks disposition to trust will positively relate to trust of the Internet by saying,

"I think when a person has a tendency to trust people, he or she will usually have a tendency to trust the Internet as well and it's security level, because people are the same in real life or virtually".

On the contrary, another comment from one of the other groups was

"The online environment is totally different from the real physical life. People in the online

environment can be who ever they want which increases the possibilities of fraudulent activities. This is why I do trust people in real life but not on the Internet. In real life, I know who they are and who I am dealing with."

Other participants from the same group commented,

"We keep hearing about online security breaches, such as the major one that occurred a few years ago where hackers stole the credit information of thousands of Internet users all over the world. So, I might easily trust people when I deal with them face-to-face but it is hard to trust them easily on the Internet".

- **Hypothesis 9: Disposition to trust will positively relate to trust of the government (TOG). (Supported by analysis)**

The same seven participants who considered the statement of hypothesis 8 to be correct, considered this statement to be correct too. They believe that one's disposition to trust directly influences his/her trust in government in which the increase of disposition to trust leads to the increase of trust in government. One of this group commented,

"It is all about one's personality. If he/she tends to have faith in people then they will have faith in almost everything been said or done by people, including the government".

Another comment was

"The government is by far much more trustworthy than individuals because it is run by law and rules; thus, if I trust people, why I don't trust the government? Of course I do".

However, the other group (three participants) didn't think that there is a direct connection between one's disposition to trust and trust in government. A participant from this opposition group who didn't agree with the statement commented,

"Again, these two trust dimensions are completely different from one another. Having a general tendency to trust others doesn't mean it increases the probabilities of me trusting the government. The impact on whether I trust the government or any one for that matter is their deeds and my own experiences with them".

- **Hypothesis 10: Trust of the Internet (TOI) will positively relate to the intention to use The MOI e-Portal. (Supported by analysis)**

All participants agreed with the above statement. Some pointed out the importance of spreading awareness within citizens of possible general risks that might occur over the Internet such as, identity theft. Some also alluded that it is the government responsibility to inform the users of its web portal of possible risks if any exists. Further, the researcher had found out that all participants have never read the section of terms and conditions of use, which is available on the MOI e-portal. Within that section there is a subsection titled 'Limitation of Liability' in which the researcher showed to participants. Two participants revealed that they didn't expect such statement to exist, and it has affected their trust of the e-portal in a negative way. For readers' information, the limitation of liability statement is

"The services offered by the MOI Portal to process on-line applications and obtain information in respect of various governmental agencies and authorities are for your convenience only. You hereby acknowledge your full awareness that Internet communications may be subject to interference or interception by third parties that this Portal does not replace information available through official channels, and that applications and administrative steps can still be performed directly before the competent authority. Therefore, resorting to this Portal remains at your own risks and, in no event shall we be liable for any loss or damage whatsoever that you may incur on account of using, visiting, relying on any statement, opinion, representation on the Portal nor resulting from any delay in operation transmission, communication failures, internet access difficulties or malfunctions in equipment or software or the conduct or views of any person who access this Portal. You hereby acknowledge and agree that your sole and exclusive remedy for any damage or loss incurred as a result of your accessing or using this Portal is to refrain from or discontinue using or accessing it".

- **Hypothesis 11: Trust of the Government (TOG) will positively relate to the intention to use The MOI e-Portal. (Not supported by analysis)**

All participants agreed with the above statement. However, surprisingly this hypothesis was not supported by analysis. One participant commented on this saying,

"I think everybody trusts the government, but this is not a sufficient reason to use the e-portal, what about other factors? I personally have faith in government but not Internet".

Another interviewee commented,

"I definitely trust the government, and believe it can provide good online services, but I don't believe I can handle them with my poor computer and Internet skills".

When revisiting the participants' answers on the survey about their trust in government, it was noticed that the majority of participants indeed had a tendency to trust the government. However, from the aforementioned participants' comments, it seems that although most particpants tend to trust the government, this percieved trust is not enough of an incentive, and did not appear to affect their intention to use e-government whatsoever. One might have faith in government and its ability to carry out online services, but doesn't have the same level of faith in the Internet or might not have the required skills to work with computers which in turn negatively affects his/her intention to use the e-portal.

In conclusion, the majority of the participants in the evaluation process had perspectives that were to a large extent congruent with the proposed hypotheses test outcomes. All of them revealed that their intentions on whether to use the MOI e-portal are greatly influenced by those who are regarded as important (e.g. family members & friends). As for perceived cyber risk, most of the interviewees agreed that when the level of such risk increases, reluctance to use the MOI e-portal and any other online systems increases as well. Further, although some interviewees revealed that it is preferable, when any problem

arises while using the portal, to go physically to the relevant government body to solve it, they all think more perceived website assistance will positively relate to their intentions to use the MOI e-portal. All of them also agreed that lower levels of perceived complexity would positively relate to the intention to use the MOI e-Portal and any other online portal. As for the supposedly relative advantage over the conventional interactions means with government, the majority of participants believed it would positively influence the intention to use the MOI e-Portal. Opinions, however, on the hypothesis proposing that more compatible ways of interaction with the government via the MOI e-portal would positively relate to the intentions to use the portal were almost split into two halves. The first half agreed with the statement and the other considered any new channel of interaction with government to be incompatible and unfavourable for people in their age. In addition, the majority agreed that when an individual has a personality, which tends to trust others, his/her trust in the Internet as well as the government would be positively influenced. As for trust in the Internet, there was a consensus among participants on the positive impact of Internet trust in relation to the use of the MOI e-portal. On the other hand, the majority of participants disagreed with the presumption that one's prestige and status increases by adopting e-government services. They also revealed that trust in government has no connection with the intention to use the MOI e-portal.

6.3 Evaluation of the Impact on the Participants' Behaviour/Attitude/Intention

After validating and confirming the research hypotheses in the previous evaluation section, a second step of evaluation, which went beyond the theoretical aspects of the study was undertaken. This led to discovering any possible impacts the research has made on the behaviour, attitude and/or intentions of the participants.

For readers' information, in literature, behaviour is defined as the various deeds and actions that individuals, groups, systems, or manmade entities carry out in accordance with themselves or surrounded environment *(*Minton & Kahle, 2014). Further, attitudes refer to the degree to which an individual likes or dislikes an object where an object reflects any dimension of the individual's world (Friedkin, 2010). Finally, intention refers to the mental state, which denotes a desire to conduct an activity in which planning and consideration usually take place beforehand (Bratman, 1987).

This part of evaluation attempted to determine not only the influence on participants towards the MOI e-portal but rather any possible influence on behaviour towards other online services, websites and technologies. Further, digital divides are also being considered in which possible impacts on the non-Internet-adopters are determined. Therefore, in order to discover such behavioural/attitudinal/intentions impacts (if any), the researcher asked few main questions to all of the ten evaluation participants. The questions were: after participating and completing the survey questionnaire of this research, which was primarily designed to explore and understand the factors by which older adults' adoption and use of e-government (MOI e-portal) are affected:

- Have I influenced your behaviour s/attitudes/intentions towards MOI e-portal in any way?

- Have I influenced your behaviour s/attitudes/intentions towards other online services and/or products in any way?

- Have I influenced your behaviour s/attitudes/intentions towards other technologies in any way?

- What has been the change(s) in your behaviour s/attitudes/intentions? If any

- When have you decided to change your behaviour s/attitudes/intentions? (e.g. at the interview, after completing the questionnaire)

- Where has the change(s) in your behaviour s/attitudes/intentions taken place? (e.g. MOI e-portal, other websites, online shopping)

- Why have you changed your behaviour s/attitudes/intentions?

In light of the above questions, following are the answers from participants, which were summarised by the researcher.

- Participant 1 (66 years old non-Internet adopter) commented,

"I have previously used the services provided online by the MOI e-portal prior to taking part in the survey. However, I have never used those services without the help of others because of Internet complexity. Frankly, the survey and its questions have motivated me and increased my curiosity towards learning and be more knowledgeable of the Internet world and also the portal and its services. After the survey, I started learning how to use the Internet and the MOI e-portal, and then I conducted a passport service by myself with no direct help of others but only supervision. It was not as difficult as I thought it would have been. I also read the news from the Internet now and watch YouTube videos".

- Participant 2 (52 years old) commented,

"I am an active user of the MOI e-portal and e-government services/products in general. I find such services to be precious as they save time and effort and are available around the clock. I can't say the research has changed my behaviour or attitude towards e-government; however, the questionnaire I had completed had a section related to the use of tablet devices for online government services, which made me think of using my tablet to interact with the government instead of constantly using the laptop. Maybe using the tablet would make the interaction easier and more enjoyable".

- Participant 3 (62 years old) commented,

"Yes, participating in the study has changed my attitude and behaviour towards the online environment in general. Now I am more cautious with regards to online security and cyber risks. Although I am not so much of an Internet person myself, but many members of my family use the Internet to acquire services and to buy products using my credit information.

So, after meeting with you and conducting the interview where we had a discussion on the possible risks of the online activities and existed protection solutions, I decided to download antivirus programs on the laptop, which I did with the help of a friend".

- Participant 4 (63 years old) commented,

"*Yes, participating in the study has changed my behaviour towards online government services provided through the MOI e-portal. I have never used this portal or any other online government portals before. I used to get assistance from the offices (businesses) that offer to assist with online services for money. After the interview with you, I asked my son to teach me and show me how to use the services provided on the portal. I find it to be a bit difficult and complicated but at least now I can log onto my account and gather information. The study encouraged me into taking the decision to learn about MOI e-portal in order for me to keep up with modern advanced technological world. I don't want to be left behind, and I still need to learn more about it".*

- Participant 5 (72 years old non-Internet adopter) commented,

"Although I found the research to be interesting and of value, it has not impacted my behaviour nor my attitude towards the MOI e-portal or online services in general. I have tried many years ago to learn more about using the Internet, but I found it to be difficult, tiring and overwhelming. I think I am too old to learn, and since I have other people to help me acquire these services when needed, I decided to keep it that way".

- Participant 6 (60 years old) commented,

"I intend to use the services provided online. Although I have been using the Internet for so many years, when it comes to interacting with the government, I get everything done physically even the small things. I think I should start familiarising myself with the online environment as the entire world is shifting into a virtual world. I guess after the survey I realised how important this is and that I am missing out the opportunity to be part of this modern fascinating world".

- Participant 7 (55 years old) commented,

"Prior to the interview, I was not aware of the great number of services the MOI e-portal offers. I thought it only offers services that are related to passports. I would say, being part of the research made me more knowledgeable of the portal and its services. However, it also made me think a lot of the risks that might exist with such services, such as identity theft. Maybe we just need pay more attention to security issues".

- Participant 8 (69 years old non-Internet adopter) commented,

"I do not think there has been any change in my behaviour since taking part in the survey. I still count on my son when need be to log onto my account and acquire services provided online by the government, and also to find general information on the Internet. The Internet is too much of an effort to use and is time consuming".

- Participant 9 (52 years old) commented,

"Yes, this research has impacted my attitude and behaviour. At the interview, we talked about privacy issues and many other liability issues that I did not know about. I found out that the MOI e-portal has long sections of privacy policy, terms and conditions and limitation of liability. These types of information are of high importance for users in order for them to be fully aware of their rights and obligations once they decide to create an account and commence receiving online services. I now read such information first thing before commencing any online engagement, especially when doing online shopping".

- Participant 10 (66 years old) commented,

"The research has changed my attitude towards the use of the MOI e-portal in many ways. Conducting online services is something I have always seen as incompatible with my life style and education level. I am an Internet user but not to the level of using governments' portals and services. At the interview you depicted some of the services provided on the MOI e-portal, which were not as difficult as I thought they were. I think I will carry out some services myself in the near future".

In light of the participants' responses to impact evaluation questions, it is concluded that the research has partially impacted many of them in terms of their behaviours, attitudes and intentions towards the use of the MOI e-portal and/or other websites and technologies.

First, in terms of behaviour, 40% of the participants believed that the research has had an impact on their behaviour. This impact on behaviour ranges from just paying more attention to the terms & conditions embedded within electronic portals to the actual implementation of online services (see tables 6.2 & 6.3). Second, in terms of attitudes, 70% of the participants revealed attitudinal changes as a direct result of being part of the research. The impact on attitudes ranges from increased curiosity towards learning about the use of the MOI e-portal to taking a positive stance with regards to the portal. Lastly, in terms of intentions, 80% of the participants thought that their intentions were influenced to some extent after their contributions to the research (see the table 6.2 & 6.3 below).

To conclude, evaluation questions depicted an overall impact on participants by 80% in all three dimensions of impact, behavioural, attitudinal and intentions whereas 20% of participants did not think they had been influenced by the research. It is noticeable though that the 'uninfluenced' participants fall into the group of senior older adults (72 & 69 years old) which might indicate the extent to which it is difficult to change one's behaviours and notions in old age. Digital divides also intercept in these cases in which those uninfluenced participants were non-Internet adopters in the first place. Further, when it comes to behaviour and attitude change towards technology, particularly computer use, it is found in

literature that although some elderly people do recognise the benefits they could gain from computer use, others are doubtful about such benefits (Saunders, 2004). Some elderly may feel too old to learn or estranged by the use of computers (Turner & Van de Walle, 2007). It was also found that elderly people tend more to express negative sentimental reactions when they make computers mistakes and errors (Birdi & Zapf, 1997; Saunders, 2004).

Table 6.2. Summary of Research Impact Evaluation on the Participants (n=10)

		Research Impact		
Records	**Age**	**Behavioural**	**Attitudinal**	**Intention**
Participant 1	66	□	□	□
Participant 2	52	×	×	□
Participant 3	62	□	□	□
Participant 4	63	□	□	□
Participant 5	72	×	×	×
Participant 6	60	×	□	□
Participant 7	55	×	□	□
Participant 8	69	×	×	×
Participant 9	52	□	□	□
Participant10	66	×	□	□

Table 6.3. Detailed Research Impacts on Participants

Types of Impact on Participants					
Detected Behavioural Impact		Detected Attitudinal Impact		Detected Intention Impact	
Becoming an Internet-adopter & conducting an e-government services provided via the MOI e-portal		Increased curiosity towards learning about the use of the MOI e-portal		The intention to use other devices to interact with the government (tablet)	
When	**Why**	**When**	**Why**	**When**	**Why**
After the survey	To acquire more knowledge of the portal and its services	After the survey	To acquire more knowledge of the portal and its services	After the survey	It might be easier and enjoyable
Download an antivirus software package onto family device(s)		Increased cautiousness regarding cyber risks in general		The intention to use online services provided by the government (the MOI e-portal)	
When	**Why**	**When**	**Why**	**When**	**Why**
After the interview	Protection against possible online breaches	After the interview	Online risks appear to be real and existing	After the survey & also after the interview	To be part of the modern technologically advanced world
Interact with the government and gather information via the MOI e-portal		Increased willingness to learn more about advanced technologies		The intention to become an Internet-adopter	
When	**Why**	**When**	**Why**	**When**	**Why**
After the interview	Not to be left behind in this current modernity	After the interview	Not to be left behind in this current modernity	After the survey	To gain Internet benefits
Read portals information (terms & conditions, disclaimer, liability statement)		More positive attitude towards the services provided via the MOI e-portal			
When	**Why**	**When**	**Why**		
After the interview	To be fully aware of my rights and obligations when connected	After the interview	These services are compatible life style		

6.4 Discussion

Although the literature of IS and technology adoption has studied the venue of e-

government services' adoption, it has not paid an equal attention to the older adults' adoption of e-government. In light of this, the main purpose of this research was to identify and explain factors influencing older adults' adoption and use of e-government services. Therefore, this section will position the findings of the research within the context of existing literature, which was consulted earlier throughout the research. The discussion will be in terms of the older adults and e-government adoption.

6.4.1 Older Adults & Digital Divide

An ageing population is occurring rapidly and globally in a phenomenon known as the "population ageing" (United Nations Population Division, 2017). The growth of elderly population is caused by the escalation in life expectancy and the decline of fertility rates. By 2017, the population of older adults reached about 15% of the total worldwide population, and by mid 21th century the number of elderlies is expected to reach 2 and a half billion (ibid). As for the context of Saudi Arabia, by 2016, elderly population (50+) was approximately 2.800.000 comprising around 14% of total Saudi population (Saudi General Authority for Statistics, 2016). Older adults are important individuals who are wealth and experience holders and need to be socially included in order to achieve "successful aging" (Becker, 2005; Czaja & Schulz, 2006).

In the literature of older adults and technology adoption, and due to the widespread use of ICT, including the Internet, many researchers attempted to study the willingness of the elderly to adopt ICT. Findings revealed a limited adoption of ICT by older adults compared to other groups within societies, which has widened the technological gap between those society segments, causing what is widely known as "digital divides" (Neves & Amaro, 2012; Czaja & Schulz, 2006; Al-Sobhi, 2011). Further, although the use of ICT by older adults is growing, they have not been included in the deployment of ICT, in which a substantial age-based digital divide exists (Neves & Amaro, 2012). Age has always been a major and decisive deterrent aspect for the use of technologies, especially the Internet to prevail and abound (Klotz, 2004). The importance of the factor of age with respect to Internet adoption was also confirmed by this research, as there was a clear decrease in the likelihood of Internet adoption as age increases. The first in section 5.4.1 showed that 'age' is a key factor with regards to Internet adoption. For example, Internet adoption rate was as high as 95.9% within the age category of 50-59 while this rate dramatically dropped to reach as low as 0% within senior adults (80+). This also confirms the findings of Lee et al (2011) that in terms of Internet acceptance, older adults are not identical groups. Rather, they can be classified into three categories form youngest to oldest; pre-senior, young-old and older-old.

Another factor that is closely related to age is the ICT illiteracy, mainly the computer illiteracy. ICT illiteracy has been widely identified in literature as a key deterrent of technology adoption within the older adults (Neves & Amaro, 2012). In terms of this research, the findings indicated a strong negative impact of ICT illiteracy on Internet adoption. It was found that 77.7% within the non-adopters of Internet were Internet

illiterate because they were either too old to learn or did not have the required skills (refer to appendix 5-2).

Further, health status of the elderlies is a decisive factor with regards to their ICT adoption. The findings of this research established the association between the participants' health status and Internet adoption status, in which the better the health, the greater the likelihood of Internet adoption and vice versa. Statistics showed that among the non-adopters of Internet, 63.7% described their health status as 'poor' (refer to the health table in section 5.4.1). It is worthwhile to point out that a large number of the 'poor' health status' participants were above 70 years old as health generally deteriorates with age. This is again an indication of the significance of age as a leading factor with regard to Internet adoption. These results are not different from the results of other studies in literature pertaining to older adults and ICT adoption. For example, Heart & Kalderon (2013) carried out a study investigating older adults adoption of health-related ICT in USA and Israel, particularly computers. They found that although there has been an escalation to some extent in the elderly adoption of technology, including ICT, many barriers to successful adoption identified in literature are still valid, including health issues and age, indicating that the elderly are not yet likely to easily accept and use a health-related ICT.

In addition to age, ICT illiteracy and health status, technology adoption literature has also identified gender as another factor of impact on older adults' technology adoption status, causing a gender-based digital divides. For example, Niehaves & Plattfaut (2014) found that gender along with other socio-demographic variables influence the elderlies' (65+) acceptance of IT, specifically the Internet. Gender was also identified as a player in the existing digital divides in the Arab world and The Middle East, such as in Qatar, Jordan and Turkey (Alhujran, 2009; Al-Shafi & Weerakkody, 2010; Acılar, 2011). Further, in accordance with the findings of those studies, the research at hand has also showed that the Internet adoption rate within the male participants was noticeably higher than the female participants with 82% and 59% respectively (refer to the gender table in section 5.4.1).

Further, it is found in literature that level of education is another main socio-demographic variable that affects ICT adoption and creates digital divides (Warschauer, 2004). This applies to both the developed countries and the developing countries. A study conducted to examine the diffusion of ICT across the European Union found that individuals with a university degree are 5.1 times as likely to use the Internet as individuals with primary school education (Vicente & Lopez, 2006). This was also confirmed in the context of Saudi Arabia where people with higher education level had more tendencies to use technology than those of lower levels of education (Alateyah et al. 2013). This is similar to the findings of this study where level of education seemed to be playing vital role with regard to Internet adoption by older adults. Data showed that the higher the education level, the more likelihood of Internet adoption, and vice versa. For example, holders of higher and 1st degrees were adopters by 100% whereas the level of adoption was as low as 12.2% with participants who had no official degrees or certificates (refer to the education table in section 5.4.1).

In conclusion, to position the findings of this research in terms of the socio-demographic factors influencing the technology adoption status of the elderly within its appropriate context, many studies in the Middle East and the Arab world found that age, gender, education level and health status to be major causes of digital divides (age, gender and education in Turkey (Acılar, 2011), age, gender and education in Qatar (Al-Shafi & Weerakkody, 2010), age, gender and education in Jordan (Alhujran, 2009), age and education in Saudi Arabia (Alateyah et al. 2013; Al-Sobhi, 2011), and age in Oman (AlShihi, 2006). The findings of this study were in line with the findings of the previous studies where there was a clear indication of the existence of age-based, gender-based, health-based and education-based digital divides. Therefore, in order to reduce such divides, government should make more investments in ICT in terms of physical and social aspects (Acılar, 2011). Promoting and providing computer education programs to people, especially to older adults, is also important in bridging the digital divide (Reffat, 2003).

6.4.2 E-government Adoption

In terms of the aim of this research, a critical question to be asked in academic research is whether e-government is diffusing its services to stakeholders and whether the services have been adopted or not (Al-Sobhi, 2011). In terms of e-government services adoption, research has largely shed light upon the factors of impact on individuals' adoption and use of e-government services. In this section of the discussion, to fulfill the aim of this research, the findings with regards to older adults' intentions to use e-government services will be discussed and positioned within the context of previous literature.

As stated in the previous section, findings of this research have confirmed the existence of many socio-demographic-based digital divides within the elderly of Hail city. Those demographic variables are key deterrent elements that prevent the elderly from using the Internet and consequently, online government services. This result is in accordance with previous studies concerning e-government adoption in Oman and Saudi Arabia (Hamner & Al-Qahtani, 2009; Sharma, 2015).

Further, in terms of attitude formation constructs applied to this research, the analysis confirmed that these constructs have vital roles in the formation process of an older individual's notion towards the use of e-government services. Primary social influence PI depicted a positive effect on older adults' intention to use e-government services. This meant that the older adults behavioural intentions of adopting e-government or not is heavily influenced by the opinions of reference groups whose perspectives are regarded to be of high importance to the older individual (e.g. friends, family, peers) (Alomari et al. 2014; Rana & Dwivedi, 2015). Previous studies in similar contexts also indicated the importance of social influence for older adults in which their opinions about e-government is affected negatively or positively based on the opinions of important people in their life (Ahmad et al. 2013; AL-Athmay et al. 2016).

Perceived cyber risk PCR also correlated highly with the intentions to use e-government services. Generally, in the online environment whether it is the provision of e-government

services or any other e-products, the influence of PCR is negative on intents. This reveals that more perceived PCR results in less likelihood to engage in online activities (Meijer, 2015; Chakraborty et al. 2016). In terms of this research, findings agreed with existing literature in which when older adults feel unsafe in an online environment due to their worries of fraudulent activities (e.g. information theft), it is most likely that they will form a very negative perception towards using e-government (Hamner & Al-Qahtani, 2009; Chakraborty et al. 2016). Therefore, it is important for online services providers to ensure the security of their services recipients by providing adequate security measures and spreading awareness among users of such measures.

The final construct contributing to attitude formation is the perceived website assistance PWA. It is the perception that an e-portal facilitates activities and provides instant assistance to its users when need be. In e-government adoption literature, PWA is a decisive factor that considerably influences users' willingness to accept and use e-government services (Alshehri et al. 2012). This is even more important for older adult users given their lack of skills and interest with regards to the use of Internet and computers (Choudrie & Vyas, 2014). In terms of this study, PWA depicted a robust positive correlation with older adults' intentions to use e-government services, indicating the importance of having 24/7 availability of efficient online assistance within the platform.

As for the proposed hypotheses based on innovation attributes of Rogers' DOI theory, all of the three hypotheses were supported by analysis with some variations among them. Complexity factor (COMP) showed a very high significance level, followed by compatibility (COM) and finally relative advantage (RA), which was supported with a lower significance level. It was not surprising that complexity exhibited a considerable influence on the intention use e-government services, especially for older adults who are usually less skilled and less knowledgeable about technology. This implies that it is essential for e-government services to be intuitive in order to increase the likelihood of citizens' e-government adoption (Carter & Belanger, 2005). Online government portals should be easy to navigate and use, and information should be structured and presented based on users' requirements. Complex websites create frustration and hinder older adults from acquiring online services; thus reducing the likelihood of willingness to use e-government services. This conclusion is compatible with existing literature of within the same context of the region under investigation (Alateyah et al. 2013; Alenezi et al. 2017).

Further, the construct of compatibility has also shown significance. In the context of this study, compatibility reflects the extent to which an older adult views MOI e-government portal to be aligned with his/her experiences, values, needs, and lifestyle. It has frequently been discovered in different online contexts such as, e-government and e-commerce that compatibility has indeed the most significant relationship with use intentions (Van Slyke et al., 2004; Choudrie et al. 2013). The last innovation attribute of this study is relative advantage RA, which was moderately supported by analysis. It is an indicator that when older adults citizens want to use MOI e-government portal, they must initially view the services provided on the portal to be easier and more convenient than the conventional

ways of receiving government services. The adoption literature has continuously identified the relative advantage factor as influential on e-government adoption (Rana & Dwived, 2015; Asmi et al. 2017).

The last sets of constructs applied to the model of this study are the trust variables. As government services are provided online, users must have trust in both the service provider (government) and the service medium (Internet) (Alomari et al. 2014; Porumbescu, 2016). Both of these trust dimensions are in turn affected by disposition to trust DTT, which means the latter has an indirect impact on adoption (Kim et al. 2008). DTT is sometimes referred to as personality-based trust because it reflects an individual tendency to trust or not to trust others (Gefen et al. 2003). In the context of this study, the greater the trust propensity of an older adult is, the more it leads to an increase in the trust of Internet and government alike. This eventually indirectly increases the intentions to use MOI e-government services. This result is in accordance with other e-government adoption studies conducted in the context of both developed and developing countries (Bélanger & Carter, 2008; Albesher, 2015). As for TOI or as many prefer to name it, the institution-based trust, it reflects the extent to which an individual perceives the institutional environment to be safe, and that appropriate structures, measures and legislations are in place (McKnight et al., 2002). Therefore, from these results, it can be learnt that the outcomes of this study emphasise the considerable positive influence that can be made on older adults' intentions to use MOI e-government, but by forming more perceived trust in the Internet. When citizens view the online environment as unreliable and insecure, the likelihood of e-government services adoption drops accordingly (Kim et al. 2008; Kurfalı et al. 2017).

In order to relate back into the literature of technology, e-government adoption and older adults, and to expliciltly explore how the findigs of this thesis fit in with existing work, the following table summarises similarities and diffrences between the findings of this thesis and the findings of other relevant studies.

Table 6.4. Discussion Summary
Similarities / Differences to Existing Literature

Existing Literature Findings	Similarities/Differences
Kurfalı et al. 2017 The study Applied a combination of the UTAUT factors as well as two trust constructs, namely trust of Internet and trust of government	**Similarities** Social influence, facilitating conditions and trust of Internet had an influence on behavioural intentions to use e-governemnt. **Differences** It was found that effort expectancy has no impact on behavioural intentions to use e-governemnt.
Al-Shboul et al. 2014 A qualitative Jordanian study applying semi-structured interviews with 36 Jordanian government officials to explore the state of e-government adoption in the country.	**Similarities** Some of the key contributing aspects to insufficient e-government adoption level are the lack of awareness of existing services, and the lack of training provision and knowledge sharing

	Differences □ Unlike the thesis at hand, this study identified the inadequate trust of e-government services as a major contributor to insufficient e-government adoption.
Alenezi et al. 2017 A Kuwaiti study used semi-structured interviews to examine adoption of e-government services.	**Similarities** □ It was found that aspects of information quality such as the ease of use, security and interpretability might hinder citizens from using e-government. **Differences** □ None
Sharma, 2015 He developed a model by which a connection has been established between service quality measurements and demographic variables on one hand and the willingness to use e-government services on the other side.	**Similarities** □ It was found that the quality dimensions of e-services, such as efficiency, reliability, responsiveness and security, significantly influence the adoption of e-government services. It was also statistically proven that some demographic variables (age & education) have a significant impact on the willingness to use e-government services. **Differences** □ Gender had no statistically signicant relationship with the disposition to use e-government services whereas the thesis at hand showed more tendencies within the male participants to adopt e-government compared to the female participants.
Ahmad et al. 2013 Employing (UTAUT) model, this study explored the influential factors of the adoption and use of e-government services in Pakistan.	**Similarities** □ Performance expectancy (e.g relative advantage), effort expectancy (e.g. complexity) and facilitating conditions (e.g. perceived website assistance) are significant influencer on adoption and use of e-government. **Differences** □ Image was shown to have a considerable influence on Pakistani users of e-government services. This was not the case for the thesis at hand.
AL-Athmay et al. 2016 A UAE quantitative study conducted to examine e-government adoption using Delone and Mclean's (2004) updated IS success model and UTAUT model	**Similarities** □ The study examined how the intentions to use e-government services by citizens in UAE are influenced by four main factors, namely social influence, system quality, information quality, and perceived effectiveness. Findings showed that these factors considerably influence citizens' intentions to use e-government services. **Differences** □ None
Asmi et al. 2017 Drawing upon TAM, This Pakistani study integrated the external factors of trust and social influence within the model of TAM in order to examine their indirect influence on e-government adoption	**Similarities** □ Similar to the thesis at hand, the study found that social influence as well as trust factors to hold a significant positive impact on both, perceived ease of use and perceived usefulness, which in turn significantly influence the intention to use e-

	government. **Differences** None
Hamner & Al-Qahtani, 2009 The study was conducted in the capital city of Riyadh using The Correlation Analysis Method between certain demographic variables and willingness to use e-government services.	**Similarities** Results indicated that age has a strong inverse relationship with citizens' desire to use e-government services in which youth are more likely to use e-government services. Factors such as, knowledge of the Internet and security were also significant as they impacted the individual users' perception of e-government. **Differences** The factor of education level was not as significant as other factors (e.g. age). Data showed that e-government is generally preferred, regardless of education level. This is different to the results of the thesis at hand where education level of participants was a decisive aspect in terms of their desire to use e-government services.
Alateyah et al. 2013 The study examined various factors drawn from TAM, DOI and quality of services model in order to study their impact on e-governemnt adoption.	**Similarities** Similar to the thesis at hand, complexity, compatibility, relative advantage and security exhibited significance. As for demographic variables, age, gender and education were very important determinants of e-government adoption. **Differences** Image exhibited a considerable influence on users of e-government services. This was not the case for the thesis at hand.
Albesher, 2015 A study took place in Saudi Arabia which was based on two main theoretical models; the models of the theory of reasoned action (TRA) and trust model.	**Similarities** Findings showed that citizens' trust in Internet, disposition to trust and social influence were important predictors of citizens' behavioural intentions to adopt e-government services. **Differences** Unlike the thesis at hand, results indicated the importance of government integrity and capability with regards to citizens' trust in e-government.
Alanezi et al. 2012 Focusing on the commonly ignored aspect of e-government services implementation quality, this study explored many quality aspects of e-government services in Saudi Arabia using interviews with professional representatives	**Similarities** Research has found that aspects such as the degree of information comprehension, ease of navigation, transparency, system availability, personalisation, processing time, interactivity, credibility, security, and privacy must be addressed in order to increase citizens adoption rate. These aspects are comparable to the factors of perceieved website assistance, perceieved cyber risk and relative advantage. **Differences** None

Carter & Bélanger, 2005 Integrating constructs from TAM, DOI and web trust models; this paper studies the impact on the adoption of e-government.	**Similarities** □ Perceived usefulness, Perceived ease of use (Complexity), Compatibility and Trustworthiness were all of influence on citizens' adoption of e-government. Further, similar to the thesis at hand, Image showed no significance. **Differences** □ Relative advantage was not supported by the analysis of Carter & Bélanger's study.
Bélanger & Carter, 2008 This study used the trustwortheniss model to determine its impact on behavioural use intentions.	**Similarities** □ Similar to the current study, trust of Internet influences behavioural use intention. Disposition to trust influences trust of Internet & trust of government. **Differences** □ Unlike the current study, Bélanger & Carter's study indicated a strong correlation between trust of government and behavioural use intentions.
Van Deursen & Van Dijk, 2011 A digital divide study of aimed to determine the causes of such divide by measuring participants' Internet use skills	**Similarities** □ Education level of participants was an important aspect of their Internet use skills. Overall, results showed that as well as the normal physical digital divide, there exists a divide in the Internet use skills among potential users. **Differences** □ Although age showed only importance in terms of operational and formal skills, these findings were not 100% compatible with the thesis at hand, as age was the most decisive factor in terms of both, adoption of Internet and Internet use skills.
Lee et al. 2011 A cross-sectional research designed to explore possible obstacles that older users (at different stages) of computer and Internet might face.	**Similarities** □ It was found that when considering Internet acceptance, older adults are not identical groups; rather, they can be classified into three categories form youngest to oldest; pre-senior, young-old and older-old. This similar to the findings of the current study where tendency to adopt and use the Internet decreases as age increases. **Differences** □ None
Choudrie et al, 2013 An e-government and Digital Divide study that applied a mixed qualitative and quantitative approach to explore the adoption of e-government by older citizens in theUK.	**Similarities** □ People who had a total lack of skills and knowledge in using computers where mostly above the age of 65 years old. Security concerns also arose as an Internet use constraint. As for e-government services adoption, it was found that compatibility issues were upon the most significant factors of impact on older citizens' adoption and use of e-government services. **Differences** □

	None
Niehaves & Plattfaut, 2014 This mixed methods paper examined theInternet adoption by the elderly by employing IS technology acceptance theories in order to understand the age-related digital divide.	**Similarities** Findings indicated that variables such as, education, gender, and age are critical determination factors. Results also showed that older adults themselves are not homogenous as age still plays a vital controlling impact. **Differences** None
Acilar, 2011 By systematically reviewing existing literature, this paper explored the state and causes of digital divides in Turkey.	**Similarities** Similar to the thesis at hand, results showed that some socio-demographic variables, such as age, gender, education level and health status are major causes of digital divides within the country. **Differences** None
Colesca & Dobrica, 2008 Using a quantitative approach, this study applied TAM to investigate the adoption of e-government in Romania.	**Similarities** Daya analysis exhibited the significance of the factors of perceived ease of use (comparable to complexity), usefulness (comparable to relative advantage) and service quality. These factors influence citizens' satisfaction, which in turn influence their adoption and use of e-government services. **Differences** None
Ahmad et al. 2013 Employing (UTAUT) model, this study explored the influential factors of the adoption and use of e-government services in Pakistan.	**Similarities** Performance expectancy (e.g relative advantage), effort expectancy (e.g. complexity) and facilitating conditions (e.g. perceived website assistance) are significant influencer on adoption and use of e-government. **Differences** Image was shown to have a considerable influence on Pakistani users of e-government services. This was not the case for the thesis at hand.
Ali & Ali, 2014 Drawing upon Technology Readiness Acceptance Model (TRAM), this paper investigates factors of influence on Citizens' acceptance and readiness in Kingdom of Bahrain in terms of e-participation.	**Similarities** Analysis indicated that among other factors, the level of optimizations, eases of use and usefulness are positively associated with citizens' readiness to engage in e- participation systems. This is similar to the findings of the study at hand especially in terms of eases of use (complexity) and usefulness (relative advantage). **Differences** None

6.4.2.1 Insignificant Results

There were two unsupported factors, which are image IM and trust of government TOG. Results showed that image is not a significant predictor of e-government adoption and has no influence on older adults intentions to use MOI e-services. This result is probably related to the notion that many older adults, with the wisdom gained through their life experiences do not really pay attention to prestige or social status issues. The second insignificant predictor of e-government adoption was TOG. TOG reveals the citizens' perceptions of the integrity and capability levels of the body providing the product or service, which is in this case the government (McKnight et al., 2002). With regards to this study, the model estimation depicted that older adults intentions to use MOI e-services are not influenced by more or less trust in government. However, after revisiting the participants' answers, it was clear that although most participants tend to trust the government, this perceived trust was not enough of an incentive, and did not appear to affect their intentions to use e-government whatsoever. It seems that their perception of e-government is solely based on Internet trust. Having provided the discussion of the findings of this research, the following section offers a reflective discussion based on Kolb's model of experiential learning.

6.5 Reflective Discussion

Towards the end of this chapter and after having completed all major aspects of this research, it is worthwhile to provide a reflective discussion from the perspective of the researcher. This explains and understands the researcher's perceptions and feelings throughout the different stages of the doctoral programme; i.e. before, during and after completing all the various phases of this research study there were some benefits, drawbacks and challenges that were faced by this research study and these are understood in this section.

Reflection is a lengthy process, which encompasses many activities, including description, analysis and assessment of our beliefs, opinions and theoretical foundations and actions (Fade, 2005). Boud et al. (1985) defined reflection as one's pursuit to comprehend and appreciate their experience and intellectual activities. Similarly, Rowntree (1988) believes that reflection involves a careful consideration and thoughtful evaluation of one's own study approaches and methods in order to verify and appreciate learning outcomes of the experience. In light of these reflection definitions and to ensure that the applied aspect of this study can be associated with theory, the experiential learning cycle model presented by David Kolb (1984) was used in which learning refers to "the process by which knowledge is created through the transformation of experience, [and] knowledge results from the combination of grasping and transforming experience" (Kolb, 1984, p. 41).

For those unfamiliar with Kolb's learning cycle, it was originally based on Lewin's 1951 model for experiential learning. According to Kolb, "Learning is the process whereby knowledge is created through the transformation of experience" (1984, p. 38). For this the

overall learning is represented by a basic four-stage learning cycle (figure 6.1). The first stage is the Concrete Experience, which reflects the novel experience; followed by a Reflective Observation on that particular experience (Kolb & Kolb, 2005). Next is the Abstract Conceptualization where abstract concepts and conclusions are constructed in order to be applied in the Active Experimentation stage. These stages therefore touch all the bases of experiencing, reflecting, thinking and testing (ibid). In the following sub-sections, each reflection stage will be further defined and discussed separately in terms of this research.

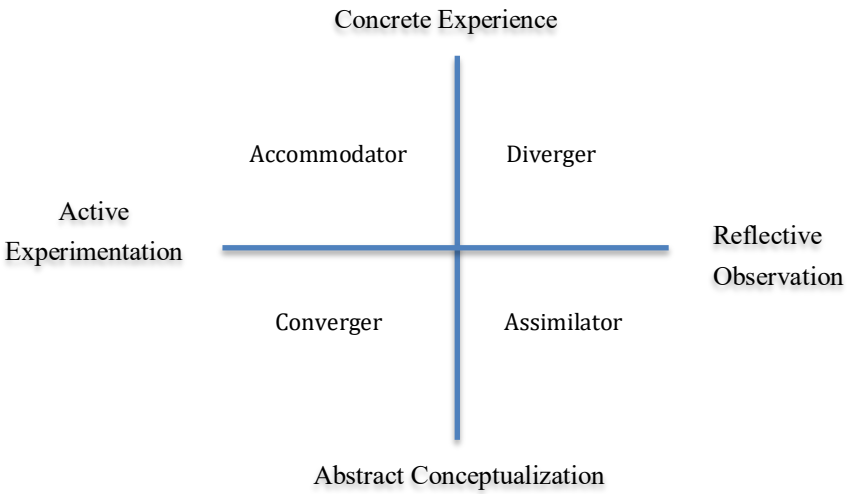


Figure 6.1. Kolb's ELT (1984)

Concrete Experience

Concrete experience reflects the stage at which the learner faces a novel situation encompassing new information and events. The learner then attempts to deal with the new situation by incorporating it to his/her own feelings, values, norms and beliefs (Blunsdon et al., 2003). When applying this to my own experience, I find it difficult to ignore my feelings when I was granted a scholarship from my employer. It was overwhelming to see what a few weeks ago was just an uncertain plan became a reality. Further, from that moment and until I arrived in the UK, I was overwhelmed by the idea that I will spend the next few years away from home in a country I have never been to before. Although I had spent three years in Australia and almost a year in the USA, the UK was different in many ways, such as the weather, the education modes, laws and regulations.

After arriving in the UK and officially starting my doctoral program, each step that followed was a challenge for me due to the novelty of the experience. The first year was the

hardest year because I was required to spend most of my time reading and learning about the subject of my thesis. The first year was the year of 'doubt' and speculations about my future and my progress in the doctoral program. It was the most difficult year throughout the entire program where I felt in many instances disappointed and lost. However, the turning point with regards to my feelings was the moment I successfully passed the first-year registration exam. This was something I really needed to raise my self-esteem and confidence in my work and myself. To sum those mixed feelings up, it was a combination of excitement, nervousness and sometimes doubt.

As for the research aspects, for me, learning about research methods and techniques was not an easy task because it was my first experience with such a large-scale research. Therefore, the first year was spent learning and reading about available research methods within IS and technology adoption literature, particularly how data was going to be collected, and what was the most feasible and suitable one for my situation. Further, having decided on the quantitative method, I needed to increase my knowledge with regards to related analysis methods. Although previous research and existing literature had much to offer in that respect, YouTube was of much greater use and assistance because of its verbal teaching and interactive nature. However, literature was very necessary in comprehending the foundations on which quantitative analysis methods are based upon. Therefore, self-learning using advanced social media platforms such as YouTube and Twitter had helped with actual model drawings and calculations whereas literature had helped with realising the suitability of existing analysis methods and understanding their underpinnings.

Reflective Observation

This stage is sometimes referred to as the 'watching' stage. Unlike the concrete experience stage where the learner mainly deals with his/her feelings and how those feelings are integrated with the new experience, at the reflective observation stage, learning occurs through observing the various existing standpoints regarding the new experience (Cortez et al., 2009). The learner tends to objectively and rationally review and examine new information in order to form the most suitable judgments and decisions.

As for my personal situation and the circumstances surrounding this research, being a master's holder teaching at a public university in my country, Saudi Arabia, I had the precious opportunity to continue my studies and build upon the little knowledge I had in the domain of information systems. The first thing I needed to carefully think about at that early stage was the topic that I want to spend the next four years investigating, learning and eventually producing knowledge about. Hailing from an educational background (with bachelor of computer education), it did not take me long to decide on discovering an area that encompasses in addition to the technological element, an educational and learning element; i.e. to study how older adults' acceptance and use of e-government services is influenced by various factors. By achieving that, the findings of the research will add on to already existing knowledge about an important segment within our societies, which in turn

will hopefully assist that segment to learn more about the potential of e-government and the enhancement it can bring about to their lives.

Another aspect is related to the selection of the elderly segment to be the core of the research. The selection was actually based on a persistent leitmotif that the elderly are left behind in technological isolation. In fact, I was also part of this general notion because of a personal experience with my parents who have usually sought and are still seeking help from younger people in their lives when dealing with new technology innovations, whether it is a laptop, a smart phone or even a home blood glucose measurement device. The next task was to select the venue of technology adoption to be studied. It didn't take long after conducting a quick research and consulting with many experts, primarily my principal supervisor, to realise that e-government is an area of significance and that older adults research within the venue of e-government adoption has been greatly overlooked, especially in the context of developing countries and the Arab world.

Abstract Conceptualisation

At this stage, the leaner 'thinks' logically and systematically about the new information surrounding the learning process in order to intellectually establish concepts and theories based on the input; i.e. the new information and experience (Blunsdon et al., 2003). For this, discussions with my supervisor helped because she made me think of other aspects such as, culture. Therefore, the learning in the abstract conceptualisation stage is "characterised by logical analysis of ideas, systematic planning and intellectual understanding of the situation" (Cortez et al., 2009, p. 128).

An example of this stage in terms of my research was related to carefully considering and understanding the traditions and norms of the Saudi society with respects to recruiting female participants. The main issue after a discussion with my supervisor was that I began to consider and thought of the division between genders in Saudi Arabia, especially in more conservative cities like Hail where the survey had been conducted. Further, as this research is not gender-oriented, rather it was age-centric; it was essential to have a reasonable participation level from the female segment within the research location. Therefore, in order to mitigate the probable impact of gender division on the female participation level, I sought the assistance of my wife who kindly agreed to accompany me and administer the survey with female participants when needed. This helped in increasing female participation rates and had eliminated any awkward situations I would have faced with participants without my wife's support. Without analysing and logically thinking of the situation and the various societal dimensions surrounding such important research element; that is conducting the survey, the research would have been severely affected and weakened.

Another aspect related to abstract conceptualisation was in fact associated with the process of reviewing the literature pertaining to the topic of my thesis. A literature review of this

magnitude was a new task for me that required a great amount of time and effort. Through the analysis previous studies of technology adoption and older adults, I was able to intellectually comprehend the situation and systematically plan my research in terms of the theoretical foundation and methodology (e.g. the conceptual framework and the research method).

Active Experimentation

Active experimentation is the last stage in kolb's experiential learning cycle in which it refers to the actual "doings" after having learnt and gained a new knowledge and after being through a certain experience (Blunsdon et al., 2003). In this stage the learner tends to apply the new knowledge gained into a new situation to solve particular problem or to test out new ideas (Kuri, N.P, 1998). In terms of this research, the richest example of the application of active experimentation took place in the final phase; that is the researcher had learnt invaluable lessons from the pilot phase, which was then benefited from and reflected on the final phase's procedures. These lessons were related to many aspects of the research, including analysis, sampling and questionnaire design. Accordingly, corrective steps were taken in order to enhance the processes of the final data collection and analysis. The matter of sampling for example, in the pilot phase, a non-probability snowball sampling was applied to collect the data. Based on that experience, although it was very effective for recruiting participants, I had learnt that such sampling technique would not be practical for carrying out larger scale survey, because it is substantially time-consuming and it would be almost impossible to recruit around 1000 participants in less than three months. Therefore, simple random sampling through the use of area random sampling seemed of more feasibility and suitability.

Further, another example of the active experimentation is that I came to realise after conducting the qualitative part in the evaluation stage of this research that applying qualitative methods have great advantages to offer. Unlike quantitative methods, qualitative ones, particularly methods that are based on semi-structured interviews, allow the opportunity of a reasonable space for both the researcher and the participants to explain and elaborate more on their thoughts and notions on the subject being investigated. Although the evaluation part was small in scale with only 10 participations due to lack of time and resources, the information acquired was of great significance in terms of older adults needs, emotions and thoughts on e-government services. Further, although I was aware beforehand of the superiority of qualitative approaches in terms of the deep understanding and the invaluable knowledge they can produce about the subject, quantitative approaches were of much feasibility and suitability for the current research due to limited resources as explained in detail earlier in chapter 3. However, having experienced both research approaches, I now have more ability to appreciate the benefits and advantages and even the drawbacks and difficulties of each approach. Therefore, based on this experience, for future research, I am going to take into account what I have learnt about the various existing approaches and the attributes of each approach.

6.6 Chapter Summary

Chapter 6 began by explaining the meaning of research evaluation process and the available types of evaluation. It was then specified that summative evaluation would be used where semi-structured interviews are the data collection method. This was followed by evaluation outcomes in terms of the opinions of participants with regards to research results as well as the influence the research has made on the behaviours and attitudes of the participants towards the MOI e-portal. The researcher then reflected on his own research experience using Kolb's experiential learning model. Finally, this chapter provided a discussion on the research findings in terms of older adults, digital divides and e-government adoption. The following chapter is chapter 7 where the thesis summary, recommendations, implications and conclusions are provided.

Chapter 7

Conclusions

7.0 Introduction

Having completed all the phases of this research, this chapter concludes the entire thesis by identifying some final points. Section 7.1 offers a thesis overview that includes a summary of each chapter. Thereafter, section 7.2 concludes with a brief, yet holistic discussion that sums up the entire thesis and findings. Section 7.3 then explains how the research questions were answered and how such answers were obtained. Finally, in section 7.4, the contributions of the research in terms of academia, policy makers and practice are offered. Limitations, future directions and recommendations are then discussed in sections 7.5, 7.6 and 7.7 respectively.

7.1 Thesis Overview & Summary

The first chapter of this thesis was an introductory chapter that informed readers of the key elements and components of the research study. Initially, it established the significant roles of advanced information and communication technologies (ICTs) and how adoption of such technologies; particularly the Internet and e-government services, can bring about change and enhancements in many aspects of the lives of both societies and individuals. Then it shed light on the groups of older adults who are less receptive to ICTs, creating a phenomenon known as the digital divide. However, literature of older adults and technology adoption, particularly adoption of Internet and e-government was minimal in the context of developing countries and the Arab world. Therefore, using this as a motivation, this study aimed to identify, explain and understand the adoption, use and diffusion of e-government services within the older adults population (50+) of a vicinity in Saudi Arabia. Thereafter, chapter one provided a summary of the research objectives, scope and approach. Finally, at the end of this chapter, an overall description of the contents of all seven chapters as well as a diagrammatic illustration of the dissertation flow and structure were provided.

The second chapter provided definitions of the key terminologies used throughout the research, such as e-government, digital divide, older adults and technology adoption. This was accomplished by conducting a comprehensive review of existing literature on related topics and areas with a particular concentration on the developing world's situation in order to form a rigorous understanding of the context surrounding the current research. A background of the theoretical and conceptual foundations across a wide spectrum of technology adoption and social science literature was then provided. The theoretical model of the current study was based upon TRA, DOI, PCI, Trust model and Learning Theories of Attitude Change, leading to the formation of four sub- conceptual categories, which are: attitudinal beliefs, innovation attributes, subjective norms and trustworthiness. Accordingly, ten constructs were applied to the conceptual model, which are: social influence, perceived cyber risk, perceived website assistance, compatibility, relative advantage, image, complexity, disposition to trust, trust of the Internet and trust of the government. Overall, 11 hypotheses were proposed to be used as a guide for identifying the

presumed relationships between the set of independent constructs and the key dependent variable behavioural intentions. Finally, at the end of this chapter, information on comparative analysis has been explained in which some key socio-demographic variables were identified and defined, including age, gender, education and health status.

Chapter three began with an overview of the existing research paradigms in order to understand the philosophical underpinnings of this research in terms of its ontological and epistemological stance. It was then declared that in terms of ontology, realism is embraced whereas objectivism is the epistemological stance of this research. Thereafter, the chapter provided a discussion on the main existing research paradigms, including Positivism, Post-positivism, Interpretivism and Constructivism. The discussion then went into discussing research reasoning (inductive Vs. deductive) and methods (qualitative Vs. quantitative). These discussions were part of the justification process for adopting the methodology of this research, including sampling methods, data collection processes and data analysis procedures. Therefore, after careful consideration of the different available IS research methodologies, this research study applied a positive scientific approach in which a deductive quantitative approach involving developing and distributing survey questionnaires was the data collection method. Three main forms of quantitative survey questionnaires were used to suit the requirements and desires of each individual participant; namely paper-based questionnaires, face-to face questionnaires and Internet-based questionnaires. The collected data in both stages (pilot & final) was then analysed using well-established analysing techniques and software packages in order to test the proposed conceptual framework and hypotheses. Further, it was imperative for this research to comply with validation procedures in order to establish reliability of the findings. The process of instrument validation began with content validity; followed by pilot testing, and finally reliability and construct validity measurements (Kim, 2009). As for the sampling methods, this chapter explained and justified the different methods applied in the different stages of the research as follows: a non-probability expert sampling for content validity stage, a non-probability snowball sampling for the pilot phase and finally a combination of probability sampling techniques: area random sampling and simple random sampling for the final phase. Finally, towards the end of this chapter, a summary of the research methodology in terms of instrument validation, pilot testing, final survey and evaluation were given.

Chapter four provided detailed information and explanations of the pilot phase of the research. It began with explanations of the research team decisions of the benefits and disadvantages of the available surveying methods that were used to administer the pilot survey in three different forms. This was followed to suit the requirements and desires of each individual participant. These forms were paper-based questionnaires, face-to face questionnaires and Internet-based questionnaires, which had been used to assess their feasibility for the final phase. The design and phrasing of questions were determined by either adopting already existing questions used previously by other researchers, or by adjusting them to suit the context of the current research (Saunders et al. 2009). Overall, the pilot questionnaire consisted of 44 questions, representing all types of variables (attributes,

behaviours and opinions). As for content validity of the pilot survey, this research adopted the method of expert panels where a group of individuals with some knowledge about the research topic were asked to assess the survey questions based on three assessment choices: "essential, useful but not essential or not necessary" (Lawshe, 1975). A non-probability snowball sampling was applied to collect the data at this phase, resulting in 257 completed responses. Analysis of the collected data was then provided, including demographic, statistical and conceptual model analyses. Finally, at the end of this chapter and after completing and evaluating procedures and outcomes of the pilot study, the research team made some alterations in relation to some questions' wordings and sampling methods to enhance the subsequent final phase.

Chapter five then explained the subsequent stage of the pilot phase that is the final phase of the research. It understood how a combination of probability sampling techniques had been used; namely area random sampling and simple random sampling. This was after learning from the pilot study that non-probability sampling will not fulfil the aim of the research. The application of this combination resulted in the identification of 24 neighbourhoods at which 1656 paper-based questionnaires were distributed to households, which resulted in 937 completed responses and a 56% response rate. Further, as any manual task, it is impossible to reach perfection when conducting a survey. Therefore, the research team took appropriate measures to mitigate the four common sources of survey errors; namely sampling errors, coverage errors, measurement errors and finally the non-response errors. This chapter presented the final outcomes in terms of demographics and Internet adoption. This part of data analysis answered the first question of the research, which focuses on understanding how the Internet adoption status of an older individual's is influenced by socio-demographic variables. Understanding what influences the elderlies' decision in terms of Internet adoption is pivotal as the Internet is the main vehicle for e-government services provision. It was found that older adults are not identical groups in which age, gender, education, and health status are all influential factors with regards to Internet adoption. The second part of data analysis analysed the theoretical model of the research in order to answer the second research question, which stated: What attitudinal, subjective norms, control and trustworthiness factors significantly influence an older individual intention to use or not use the MOI e-portal services? For that, 11 hypotheses were proposed in order to examine the factors by which older adults' intentions to use MOI e-portal services are affected. Overall, 9 of the 11 hypotheses were supported by the outcomes of the model evaluation with some disparities amongst them. Finally, sub-group analysis in terms of age and gender was then conducted and presented at the end of this chapter.

Chapter six that was diverse to the previous chapters examined the evaluation & discussion. Having provided the findings and results of the research study, it was important to validate and establish credibility for such findings in a process widely known as the evaluation process (Panneerselvam, 2004). For that, after careful consideration of the available types of research evaluation, summative evaluation was applied where semi-structured interviews with 10 participants were conducted. Throughout these interviews, it was possible to reflect

on the research results by seeking the thoughts and opinions of the participants with regards to research findings. It was also beneficial in terms of exploring possible influences the research had made on the behaviours and attitudes of the participants towards the MOI e-portal. Further, the second part of this chapter attempted to position the research findings within the context of existing literature on technology adoption, e-government, older adults and digital divides with a particular concentration on developing countries' literature. Providing this discussion allowed clarifying and identifying the academic contributions of the research at hand. Finally, a reflection of the researcher was offered at the end of this chapter.

Finally, *chapter seven* concluded the research by commencing with a summary and an overview of the thesis. This was followed by a reflective discussion on the research questions, and how the research answered those questions. Towards the end, the chapter offered the research implications in terms of academia, industry and policy makers. Thereafter, the limitations of the research, future directions and recommendations were provided and a summary of the thesis and the chapter conclusions.

7.2 Thesis Conclusions

To obtain economic growth, governments and organisations around the globe have been heavily investing in building robust telecommunication infrastructure in the endeavour to take on the advantages of advanced ICTs. Such ICT advancements have remarkably transformed various aspects of the daily life of people. An important aspect is the form of interaction between governments and citizens. Accordingly, governments are making large investments in building reliable Internet infrastructures that are capable of providing online government services over the Internet, also simply known as e-government. However, although these revolutionary technologies have been well received by citizens, there are marginal demographic groups that have not availed and embraced these technologies, leading to an uneven distribution of novel technologies and creating digital divides. One of these groups is the older adults who were identified in this research as being 50 years old and above.

Due to medical advances and enhanced quality of life, an aging population is growing exponentially all over the world. Presently, older adults are accomplishing 'successful aging' as they possess and have acquired invaluable both tangible and intangible assets in the form of wealth, experience, knowledge and skills that are viewed important for present day living. Further, after an extensive literature review, it was found that literature of older adults and technology adoption; particularly adoption of Internet and e-government lacks the context of developing countries and the Arab world. Therefore, all of the previous points motivated the formation of aim of this study, which is to identify, explain and understand the adoption, use and diffusion of e-government services within the older adults population (50+) of a vicinity in Saudi Arabia.

To fulfil the aim, literature was consulted to decide on the approach to be used for research data collection and analysis. In the area of e-government and technology adoption, various

researchers have used various methods to conduct their studies. As for this research, a quantitative approach, involving distributing survey questionnaires was identified as the most appropriate to fulfil the aim. Data analysis thereafter comprised of two levels, the first level studied how Internet adoption might be influenced by certain demographic variables. It was crucial to study Internet adoption because the Internet acts as the backbone and the main channel for e-government delivery to citizens (Norris et al. 2001). The second level pertained to the theoretical model analysis where Partial Least Squares based Structural Equation Modeling (PLS-SEM) was used to test the model. The constructs of the model were derived from well-established and renowned theories and models within the literature of IS and technology adoption (TRA, DOI, PCI, learning theories of attitude change and trust model). To test the model, and based on rigorous review of literature, hypotheses were formed and used as a guide for identifying the presumed relationship between the set of independent constructs and older adults intentions to use the MOI e-government services.

Findings showed that there is a strong association between Internet adoption status and key demographic variables. For instance, in terms of age, it was found that older adults are not identical groups in which the likelihood of Internet adoption decreases as age increases. This was also applicable to education level where Internet adoption rates dropped dramatically as level of education decreased. Older adults with poor health conditions were also found less likely to adopt and use the Internet. As for gender, male elderlies depicted more tendency to adopt the Internet compared to female elderlies, indicating the existence of gender-based digital divide. Employment was also a decisive factor with regards to Internet adoption in which unemployment was strongly associated with increased rates of non-adoption of Internet.

As for the theoretical model and hypotheses, findings revealed that 9 of the 11 proposed hypotheses were supported by analysis. In terms of attitude formation factors, the analysis confirmed that these constructs have vital roles in the formation process of an older individual's notion towards the use of e-government services. Similarly, the factors based on innovation attributes of Rogers' DOI theory also showed a significant influence on older adults' behavioural intentions to use the MOI e-government services. Model estimation also identified disposition to trust (DTT) and trust of the Internet (TOI) as influential with regards to older adults behavioural intentions. In contrast, analysis did no establish any statistical significance in terms of the two factors of image and trust of the government.

The findings of this research study are anticipated to enrich the literature pertained to developing countries as it offers academia with insights in relation to older adults and technology adoption, particularly the Internet and e-government. This work can be extended and conducted at a much larger scale, leading to making valid invaluable generalisations. The study offered better understandings of older citizens and their behavioural intentions, which can be used by policy makers to enhance the experience of older citizens when using government services provided online. It is expected that this research will encourage policy makers to address the concerns of older citizens by engaging and collaborating with them in their G2C e-projects, and to promote awareness amongst

older communities of the advantages and benefits of their online services. Likewise, practitioners within the private sector (e.g. Internet services providers, online market places) can also use the findings to promote their services and reach out to older adults.

7.3 Reflecting on the Research Questions

This research was conducted in two main phases: a pilot and final. These investigations were conducted in order to fulfil the aim that is to identify, explain and understand the adoption, use and diffusion of e-government services within the older adults population (50+) of a vicinity in Saudi Arabia. In the endeavour to fulfil that aim, research questions were formed accordingly, which will next be addressed.

Research Question 1: What socio-demographic variables significantly influence an older individual to adopt or not adopt the Internet?

To remind readers, the scope of this research study extends to cover not only the adoption and use of e-government services but also to cover Internet penetration and use within older adults. The Internet is the main, if not the sole, channel by which citizens receive online government services, meaning that in order for an individual to be e-government services adopter he or she must adopt the Internet first. Therefore, for the sake of reaching a better understanding of the issues and effects that surround the e-government services adoption by older adults, it was crucial to include the Internet adoption component. To achieve such understanding and to answer the first research question, the survey questionnaires included many demographic questions in terms of age, gender, education level, employment, occupation and health status.

Demographic data was analysed using cross-tabulations as well as the Fisher's exact test, which is a well-recognised and rigid statistical test that is used to check whether any given two variables are independent from each other by examining whether the proportions of one variable are different based on the value of the other variable (McDonald, 2014). Results indicated the following:

Age is an important influential element with regards to Internet adoption among older adults as the results showed a clear reduction in the likelihood of Internet adoption as age increases. Further, gender was also significant as results implied a larger Internet diffusion within the male older adults than the female older adults. As for education level, in general, results showed that the higher education level of an older adult, the more likelihood of him/her to adopt the Internet. In term of employment status, analysis showed that the level of Internet adoption reduces when considering unemployed participants compared to the employed ones. This led to the analysis of occupation where there was a clear association between participants with no occupation and not adopting the Internet. Finally, in terms of participants' health status, it was clear that there is a strong relation between one's health status and Internet adoption, in which the better the health, the greater the likelihood of Internet adoption and vice versa. In conclusion, key socio-demographic variables, including

age, gender, education level, employment and health status indicated statistical association with the Internet adoption status.

Research Question 2: **What attitudinal, subjective norms, control and trustworthiness factors significantly influence an older individual intention to use or not use the MOI e-portal services?**

To answer this question, participants who were Internet adopters were surveyed. The questionnaire consisted of 7 likert-scale questions related to the factors of the formed theoretical model. Further, 11 hypotheses were proposed in order to examine the factors by which older adults' intentions to use the MOI e-portal services are affected. Overall, 9 of the 11 hypotheses were supported by the outcomes of the model evaluation with some disparities amongst them. The following is a brief explanation of the findings.

Attitudinal Beliefs

5- Social influence, which refers to the impact a reference group has on an individual's behaviour. The reference group includes family members, partners, friends and colleagues. Results showed that when elderlies are encouraged by family or friends to use the MOI e-portal, the possibility of use in this group increases.

6- Perceived Website assistance, which is the perception that a website facilitates a user's activities and provides suitable support when needed. Findings revealed that perceived website assistance is positively related to the older adults' intentions towards using The MOI e-Portal.

7- Perceived Cyber risk, which relates to an individual's reluctance and/or hesitations to use an online system due to the likelihood of being a victim of cybercrimes. Results indicated that older adults are negatively affected by this factor in which the more the level of perceived cyber risk, the less the possibility to adopt and use The MOI e-Portal.

Innovation Attributes

1- Compatibility, which is "the degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of adopters". Analysis indicated that perceived compatibility when using the MOI e-portal services considerably influences the intentions of older adults to use those services.

2- Relative advantage, which refers to the perception that an individual develops, in which he or she can conduct a task more easily by adapting the new innovation. It was found by analysis that greater levels of perceived relative advantage positively relate to older adults' intention to use the MOI e-portal services.

3- Complexity, which is "the degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand". Outcomes revealed a strong relation between complexity and intention to use the MOI e-portal services in which lower degrees of complexity necessarily lead to greater probabilities to use e-the MOI e-portal services.

Subjective Norms

1- Image, which refers to "one's perceptions of an innovation as a status symbol". For this, we examined whether older adults viewed the adoption and use of the MOI e-portal services to be prestigious and whether they believed this increases the social status of the user. The study could not establish any relation between the factor of image and the intentions of elderlies to use the MOI e-portal services.

Trustworthiness

1- Trust of the Internet, which refers to "an individual's perceptions of the institutional environment, including the structures and regulations that make an environment feel safe". It was proven by analysis that the more trust an older individual has in the Internet, the more the tendency to use the MOI e-portal services and vice versa.
2- Trust of the government, which refers to "one's perceptions regarding the integrity and ability of the agency providing the service". This factor was found to be of no influence on elderlies' intentions to use the MOI e-portal services. However, after revisiting the particpants' answers, it seems that, although most particpants tend to trust the government, this percieved trust was not enough of an incentive, and did not appear to affect their intentions to use the MOI e-portal services whatsoever. It seems that when it comes to the matter of trust, their perception of e-government is solely based on trust in the Internet.
3- Disposition to trust, which is defined as whether an individual tends to have faith and trust in others, without any immediate external influential factors. This factor has only indirect impact on intentions to use the MOI e-portal services as it has been only studied in relation to the factors of trust in government and trust in the Internet. Results show that the greater the level of disposition to trust an older individual, the greater the tendency to have faith in both the government and the Internet which in turn affects his/ her intention to adopt the MOI e-portal services.

7.4 Implications

After completing this research, there are three dimensions of implications, which are discussed in the following sections.

7.4.1 Academia

The main motivation for conducting this research study was to reduce the gap in the literature pertaining to the topics of technology adoption, e-government, digital divides and older adults in the context of developing countries and the Arab world; particularly in the context of Saudi Arabia. Age-related and elderly-centric studies are particularly important given the fact that the world is experiencing acceleration in the elderly populations in a phenomenon known as the "population ageing" (United Nations Population Division, 2017). Therefore, this study contributes to the existing literature of academic research by providing more knowledge and awareness of older adults and technology use, specifically the Internet and e-government services.

Another contribution to academia is the development of a valuable theoretical framework that was drawn from well-established and well-recognised theories and theoretical models in IS field, namely The Theory of Reasoned Actioned (TRA), Learning Theories of Attitude Change, Diffusion of Innovation (DOI), The Perceived Characteristics of Innovating (PCI) and Trustworthiness (see figure 7.1). The application of the learning theories of attitude change is particularly useful for understanding how individuals behave towards new technologies because it provides theoretical means to comprehend the key sources of attitude formation (Chen & Sharma, 2015).

Hypotheses were also proposed accordingly to examine and understand factors of influence with regards to older adults' intentions to use e-government services in Saudi Arabia. The findings of this study are anticipated to lead to a better understanding of the digital divide and its impacts on e-government services using the example of a population drawn from a marginal, socio-demographic group of Saudi Arabia. This is particularly important because that socio-demographic group; that is the older adults, has widely been overlooked by researchers. Therefore, this research offers insights and knowledge that will help in understanding and appreciating such under-represented societal segment.

This research also contributes to academia with its use of two primary datasets that were generated throughout the pilot and the final phases. This is of particular importance for two reasons; first is the fact that there are not many studies based on primary data conducted in the context of Saudi Arabia, and second because of the importance of primary data in ensuring that the developed theoretical model is applicable to practice. In addition, this study sheds light on the challenges that researchers face if they want to carry out a research that examines both genders within a context that has similar attributes to that of Hail city in terms of cultural aspects and traditional norms. For example, one cultural aspect that was addressed within this research is the division between genders, which was anticipated to make it difficult for the principal researcher to acquire reasonable participation level from females. Therefore, this was tackled by having a female assistant (this was approved by the UOH ethics committee, refer to appendix 3-7) accompanying the researcher for a month when visiting participants at their houses in an attempt to increase the number of female participants. Finally, the fact that there are only few large-scale studies based on primary datasets undertaken in Hail city, this research therefore provides a realistic view of existing

challenges that might be useful for future research.

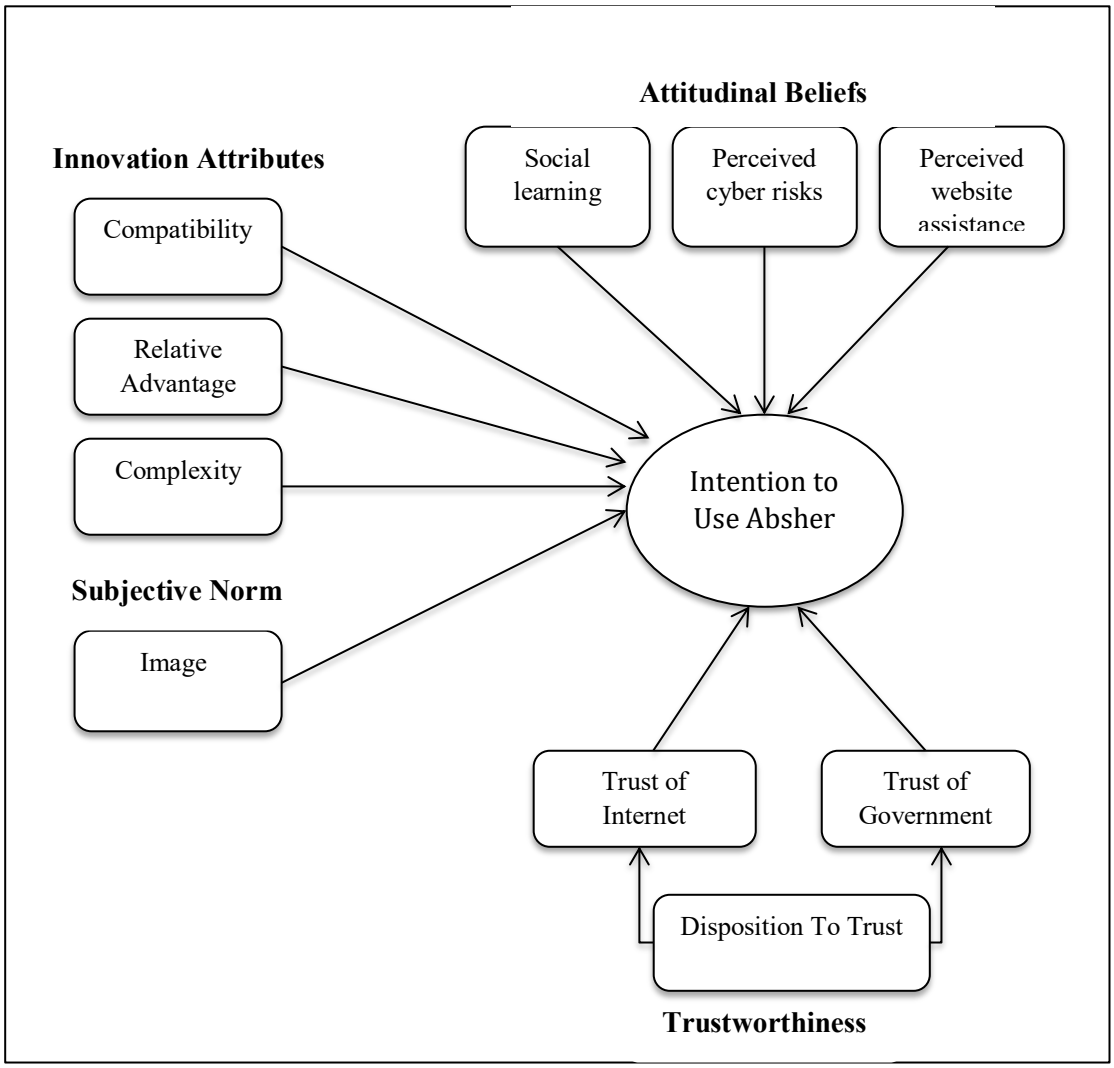


Figure 7.1. Conceptual Model of The Willingness to Use E-government Services

7.4.2 Industry & Practice

This study identified factors that private sector providers could use when providing particular online goods and services within the Saudi Arabian community. The contributions are also provided for Internet service providers who seek to increase their customer numbers. This is necessary for organisations in order to increase profits; therefore, by highlighting and identifying the issues that older adults in Hail city face when seeking online products and services, this research can inform Internet service providers in order to overcome the issues related to them. This study has also surveyed and identified the preferences of older adults in terms of their favourite tablet devices' specifications as well as their preferred type of Internet connection. This is particularly important for the telecommunication companies operating in Saudi Arabia as it assits them in understanding the needs and preferences of their potential customers.

Further, in terms of e-government, Bélanger and Carter (2012) identified that practitioners show a high interest in e-government. For example, the IBM Centre for the Business of Government supports research efforts that provide "insightful findings and actionable recommendations for government executives and managers, with several strategic areas focused on the use of information and communication technologies" (Breul & Kamensky, 2011, p. 3). Therefore, this work is foreseen to be leading to interest from e-government practitioners into the factors that older adults, specifically in a Middle Eastern country, would favour, or not.

7.4.3 Policymakers

It was identified that most studies have been conducted at the national, rather than at local/state, provincial level. This study has paid attention to that issue and provided insights from a vicinity of Saudi Arabia, Hail City and provided a deeper insight from a sample population that is not emphasised in e-government research. Therefore, this study identified ways that the e-government portal can become more pronounced within one group of society, the older citizens. Having stated the value of this research for policy makers in terms of the older adults, the outcomes of this research can also be extended and widened to profit from when regarding other segments of society (e.g. younger citizens). In summary, the findings of this research identified the eminent role of government authorities in bridging the gap between the older adults (users) and the ICT service providers (companies).

7.5 Limitations

Every study has limitations, which was also the case in this study. This section identifies the limitations. Every human effort comes with limitations and weaknesses, including research studies, and it is the researcher's duty to identify such limitations to the readers (Cooper & Schindler, 2013). Therefore, the limitations of the study are discussed below.

Although this study represented the context of Saudi Arabia in terms of technology adoption and older adults, the findings cannot be generalised to the national level because this study took place in the city of Hail, which is a medium sized city. Therefore, a limitation of the study is that it lacks the context of smaller rural and larger urban cities where situations might differ.

Another limitation is related to the snowball sampling method used for the collection of data in the pilot study. The main criticism of this technique is the likelihood of bias, given that participants recommend and identify each other, which might create a homogenous research sample (Lee, 1993). In other words, the sample might not be sufficiently representative of the total population. Having identified this limitation, it is worthwhile to recognise that snowball sampling helped the researcher in collecting the required data and to gain more experience and surveying skills, which were later used at the final phase. Further, for the final phase, to mitigate the possibility of low representativeness of the sample, a combination of probability sampling techniques: area random sampling and

simple random sampling were employed in order to guarantee that every household within the created sub-areas of Hail city had the chance to be included (Kothari, 2004).

In terms of the socio-demographic variables, although this study analysed key variables, such as age, gender, education level and health status, it lacks other aspects that might be important in terms of their influence on adoption of e-government and/or Internet technologies in general. One variable that was intentionally neglected because of its sensitivity in the Saudi culture is the income level. Other researchers can include this aspect for future studies as it might bring further understandings of the topic of e-government and Internet adoption.

Further, this research study applied a quantitative approach in which survey questionnaires were the data collection method. It is argued, "A survey, no matter how complex or sophisticated, provides only a snapshot of the phenomena" (Mcnabb, 2010, p.105). This means that findings of this research are only representative of older adults over a specific and limited period of time that is the period survey was carried out. In addition, qualitative research methods arguably give researchers the ability to deeply analyse collected data by dealing with words and the meaning within words and data (Myers, 1997). However, due to resource limitations in terms of time, budget and manpower, it was not possible to apply qualitative or mixed methods approaches.

Another limitation is related to the content validity in which three questions had been regarded by the expert panel to be irrelevant to the purpose of the research (see appendix 3-3 & 3-4). Those three questions are:

(1) Who is the network provider of your tablet(s) device?

(2) How do you pay for your tablet device?

(3) Where do you get information regarding the use of your tablet device?

However, although the panel rejected some questions, the research team decided to keep them because the rejection was not based on theoretical and/or ethical reasons. Those questions might not be directly related to the main topic of the study, but they are believed to provide statistical benefits when analysed in this research or in a separate future study.

Finally, in terms of reliability and validity of the model and constructs measurements, althought most of the model constructs and items depicted substantial relaibility and validity, there was one outlier (the factor loading of DTT1 with a value of 0.691). Having acknowledged that, this load is very close to the satisfactory value of 0.707; therefore, it doesn't damage the validity of the construct.

7.6 Future Directions

Having highlighted the limitations of this study, the future directions of this study are provided. This study applied a quantitative approach that was based on survey questionnaires; therefore, applying a qualitative approach where other data collection

methods take place (e.g. interviews & observations) might deliver more in-depth understanding of the older adults needs and views towards e-government adoption.

Another future direction is related to the location of the study. As this research study took place in one city of Saudi Arabia, future research could be expanded to other contexts in different cities and/or countries of the region in order to make useful comparison of the findings and to enrich older adults and developing countries literature. For example, policy makers in Saudi Arabia can conduct this research at the national level in order for all older adults across the country to be included. This will provide the government with the opportunity to understand the challenges that older adults encounter when using their online services.

Further, this research is an elderly-centric, meaning that it only sought the perspectives of older adults. Therefore, researchers are encouraged to expand this study to include the perspectives of the MOI e-portal policy makers, portal designers and any other relevant staff.

In terms of the theoretical model of this study, it is believed to produce invaluable knowledge on other related topics and venues of technology adoption and older adults, such as electronic commerce. This belief is derived from the fact that only few studies have attempted to combine adoption factors with well-established trust constructs in an older adult research study.

7.7 Recommendations

The completion of analysis and evaluation of this research study has made it possible for the research team to comprehend the adoption, use and diffusion of e-government services within the older adults population (50+) in Hail city, Saudi Arabia. Accordingly, recommendations are provided below.

The findings indicated the importance of the social influence factor on older adults' acceptance and use of e-government services. Evaluation showed that many of the older adults participants have had some assistance from younger people with regards to the use of e-government services and the Internet in general. Generally, younger adults have the ability to assist the elderlies because they belong to the digital generation and are more knowledgeable of the use of modern technologies. Therefore, officials and e-government policy makers should recognise the important role younger generations can play in teaching and qualifying older adults for e-government services use, and then spread awareness about such role within communities. In other words, government should publicise its online services to older citizens by reaching out to younger citizens, enhance their knowledge of the provided online services and encourage them to help their older relatives learn more about these services.

Additionally, in light of this, many older adults are willing to learn about e-government services but in many cases they are unable to use them as a result of lacking knowledge and

skills. Government therefore should provide free training sessions at communities level in order to reach out to as many older citizens as possible.

In light of the findings of the theoretical model analysis, government should address and acknowledge the concerns and worries of older adults to promote the use of their online services. For example, robust security measures and privacy assurance should be made to tackle the concerns of the elderly. Further, increased responsiveness (e.g. 24/7 assistance availability), and reduced website complexity are measures that will help the elderly to deal with possible difficulties they might face while using e-government services.

Having stated the above recommendations, which are all projected to increase older adults' engagement in e-government interactions and to offer them a good online experience, it is also essential for policy makers to note that some groups within the older adults citizens may never use online services due to their age or/and health difficulties. Therefore, reasonable and sufficient non-electronic means to interact with the government should always be available for those who are unable to have online presence (e.g. telephone services) (Choudrie et al. 2013).

7.8 Chapter Summary

This chapter brings together some of the final points and conclusions of this investigative research. It began with a thesis overview where a summary of each chapter was given. The following section then provided a holistic conclusion of the thesis, identifying key points within the investigation was included. This chapter also offered a brief discussion that reflected on the research questions, explaining how each question was answered. Thereafter, research implications in terms of academia, industry and policy makers were provided. Towards the end, the limitations, future directions and recommendations of the research were given.

List of References

A

Acilar, A. (2011). Exploring the aspects of digital divide in a developing country. *Issues in Informing Science and Information Technology*, 8, 231-244.

ActiveAge, (2010). The social and economic benefits of older people actively contributing to community capacity and ways in which ICT can enable this to happen. An ActiveAge Discussion Paper. Available at: < https://goo.gl/1MxvMt > [Accessed: Aug 2015].

Ahmad, M. O., Markkula, J., & Oivo, M. (2013). Factors affecting e-government adoption in Pakistan: a citizen's perspective. *Transforming Government: People, Process and Policy*, 7 (2), 225-239.

Ajzen, I. (1985). From intentions to actions: a theory of planned behaviour, in: J. Kuhl, J. Beckmann (Eds.), Action Control: From Cognition to Behaviour , *Springer, New York*, 11-39.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes,* 50(2), 179–211.

A˚kesson, M., Ska˚le´n, P., & Edvardsson, B. (2008). E-government and service orientation: gaps between theory and practice, *The International Journal of Public Sector Management*. 21(1), 74-92.

Alanezi, M.A., Mahmood, A.K., & Basir, S. (2012). E-government service quality: A qualitative evaluation in the case of Saudi Arabia. *EJISDC, 54(*3), 1-20.

Alateyah, S., & Crowder, R., & Wills, G. (2013). An Exploratory study of proposed factors to Adopt e-government Services: Saudi Arabia as a case study. *International Journal of Advanced Computer Science and Applications*, 4(11), 57-66.

AL Athmay, AA., Fantazy, K., & Kumar, V. (2016). E-government adoption and user's satisfaction: an empirical investigation. *EuroMed Journal of Business,* 11(1), 57-83.

Albesher, A. (2015). PhD Thesis: Trust as a Source of Long-Term Adoption of E-government. *Brunel University London*.

Aldhaban, F., Daim, T. U., & Harmon, R. (2016). Exploring the Adoption and Use of the Smartphone Technology in Emerging Regions: Case of Saudi Arabia. *Proceedings of PICMET '16: Technology Management for Social Innovation*, 2922-2930.

Alenezi, H., Tarhini, A., Masa'deh, R., Alalwan, A., & Al-Qirim, N. (2017). Factors Affecting the Adoption of e-Government in Kuwait: A Qualitative Study. The *Electronic Journal of e-Government*, 15(2), 84–102.

Allen, I.E., & Seaman, C.A. (2007). Likert Scales and Data Analyses. *Quality Progress.* Available at: http://rube.asq.org/quality-progress/2007/07/statistics/likert-scales-and-data-analyses.html [Accessed Apr. 2018].

Al-Majali, M., & Mat, N.K.N. (2011). Modeling the antecedents of internet banking service

adoption (IBSA) in Jordan: A Structural Equation Modeling (SEM) approach. *JIBC,* 16(1).

Alomari, M. K., Sandhu, K., & Woods, P. (2014). Exploring citizen perceptions of barriers to e- government adoption in a developing country. *Transforming Government: People, Process and Policy*. 8(1), 131-150.

Al-Shafi, S., & Weerakkody, V. (2010). Factors affecting e- government adoption in the state of Qatar. *Proceedings of the European and Mediterranean Conference on Information Systems*.

Al-Shboul, M., Rababah, O., Al-Shboul, M., Ghnemat, R., & Al-Saqqa, S. (2014). Challenges and Factors Affecting the Implementation of E-Government in Jordan. *Journal of Software Engineering and Applications*, 07(13), 1111–1127.

Alshehri, M., & Drew, S. (2010). A Comprehensive Analysis of E-government services adoption in Saudi Arabia: Obstacles and Challenges. *The International Journal of Advanced Computer Science and Applications*, 3(2).

Al-Sobhi, F. (2011). The Roles of Intermediaries in the Adoption of E-Government Services in Saudi Arabia. Available at: <http://core.kmi.open.ac.uk/download/pdf/6113215.pdf> [Accessed 10th Dec. 2014].

Al-Tourki, T., El-Sofany, H. F., Al-Sadoon, A., & Al-Howimel, H. (2012). E-government in Saudi Arabia: Barriers, Challenges and its Role of Development. *International Journal of Computer Applications*, *48*(5), 975–888.

Anheier.H.K., & Toepler, S. (2010). International encyclopaedia of civil society. *Springer Science Business Media.*

Antonelli, C. (2003). The digital divide: understanding the economics of new information and communication technology in the global economy. *Information Economics and Policy.* 15, 173–199.

Appannaiah, H. R., Ramanath, H. R., & Reddy, P. N. (2010). Business Research Methods. New Delhi : *Himalaya Publishing House*.

Asmi, F., Zhou, R., & Lu, L. (2017). E-government Adoption in Developing Countries: Need of Customer-centric Approach: A Case of Pakistan. *International Business Research*, 10(1), 42-58.

B

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: *Prentice-Hall*.

Barbara, B. Kawulich. *(*2005). Participant Observation as a Data Collection Method, Forum: *Qualitative Social Research, 6(2).*

Barbra, T., devaney, J., forrester, D., scourfield, J., & carpenter, J. (2016). Quantitative research methods for social work: making social work count. *Palgrave Macmillan*.

Barzilai-Nahon, K. (2006). Gaps and Bits: Conceptualizing Measurements for Digital Divide/s. *The Information Society* 22, 269–278.

Becker, S. A. (2005). E-government usability for older adults. *Communications of the ACM,* 48(2), 102-104.

Bélanger, F., & Carter, L. (2008). Trust and risk in e-government adoption. *Journal of Strategic Information Systems*, 17, 165–176.

Bélanger, F., & Carter, L. (2012). Digitizing Government Interactions with Constituents: An Historical Review of E-Government Research in Information Systems. *Journal of the Association for Information Systems,* 13(5), 363-394.

Bell, J. (2005). Doing Your Research Project: A Guide for First-Time Researchers in Education, Health and Social Science (4th edition). *Open University Press.*

BELLA, P. (2006). Attitude acquisition. *Motivation Peek.*

BEM, DJ. (1967). Self-perception: the dependent variable of human performance. *Organizational Behavior and Human Decision Processes,* 2(2), 105–121.

BENEDICT, R. (1934). Patterns of Culture. Houghton Mifflin, *New York.*

Berg, N. (2005). Non-response bias. *Munich Personal RePEc Archive*. Available at: https://mpra.ub.uni-muenchen.de/26373/1/MPRA_paper_26373.pdf [Accessed: Apr 2016].

Bettany, S. (2016). Philosophy in Business and Management research. *Bradford University*. Available at: http://slideplayer.com/slide/4193465/ [Accessed: November 2017].

Bigley, G. A., & Pearce, J. L. (1998). Straining for shared meaning in organization science: Problems of trust and distrust. *Acad. Management Rev,* 23(3), 405–421.

Birdi, K. S., & Zapf, D. (1997). Age differences in reactions to errors in computerbased work. *Behaviour & Information Technology*, 16(6), 309–319.

Blunsdon, B., Reed, K., Mceachern, S., & Mcneil, N. (2003). Teaching Organisational Theory in Undergraduate Management Programmes: An exercise in facilitated theory testing for active experimentation. *Journal of Further and Higher Education,* 27(1), 3-14.

Bolton, R. N., & Drew, J. H. (1991). A multistage model of customers' assessments of service quality and value. *Journal of Consumer Research*, 17, 375-384.

Boud, D., Keough, R., & Walker, D. (1985). Cited in: Allin & Turnock. (1985). Reflection: Turning experience into learning. *Kogan Page*.

Brace, I. (2008). Questionnaire design; How to plan, structure and write survey material for effective market research. (2nd Edition). *Replica Press Pvt Ltd.*

Bratman, M. (1987). Intention, Plans, and Practical Reason. Cambridge, MA: *Harvard University Press.*

Breul, J. D., & Kamensky, J. M. (2011). *2011 Call for Research Report Proposals*. IBM Center For The Business Of Government: Washington, DC. Available at: http://www.businessofgovernment.org/report/ibm-center-2011-call-research-report-proposals [Accessed: Oct 2017].

Brown, D. H., & Thompson, S. (2011). Priorities, policies and practice of e-government in a developing country context: ICT infrastructure and diffusion in Jamaica. *European Journal of Information Systems* 20, 329-342.

Brown, S., Venkatesh, V., & Bala, H. (2006). Household Technology Use: Integrating Household Life Cycle and the Model of Adoption of Technology in Households. *The Information Society*, 22, 205–218.

Brown, S.A., & Venkatesh, V. (2005). Model of adoption in Households: A baseline model test and extension incorporating household lifecycle. *MIS Quarterly,* 29(3), 399-426.

Brown, S. (2008). Household technology adoption, use, and impacts: Past present and future. *Information Systems Frontiers* Issue, 10, 397-402.

Burns, N., & Susan, S.K. (2007). Understanding Nursing Research (4th edition). Missouri: *Elsevier Publication*.

Burgess, R. (1986). Key Variables in Social Investigation. *Routledge*, London.

C

Caldow, J. (1999). The Quest for Electronic Government: A Defining Vision. Institute for Electronic Government, *IBM Corporation*.

Campbell, D., & Campbell, S. (2008). Introduction to Regression and Data Analysis. *Statlab Workshop*, 1–15.

Carter, L., & Bélanger, F. (2005). The utilization of e-government services: citizen trust, innovation and acceptance factors. *Information Systems Journal.* 15, 5-25.

Chakraborty, R., Lee, J., Bagchi-Sen, S., Upadhyaya, S., & Raghav Rao, H. (2016). Online shopping intention in the context of data breach in online retail stores: An examination of older and younger adults. *Decision Support Systems*, *83*, 47-56.

Chen, R., & Sharma, S.K. (2015). Learning and self-disclosure behavior on social networking sites: the case of Facebook users. *European Journal of Information Systems*. 24, 93-106.

Chin, W.W., & Todd, P.A. (1995). On the use usefulness, and ease of use of structural equation modeling in MIS research: A note of caution. *MIS Quarterly,* 19(2), 237-

246.

Choudrie, J., & Dwivedi, Y., K. (2006). Investigating Factors Influencing Adoption of Broadband in the Household. *Journal of Computer Information Systems*, 46(4), 25-34.

Choudrie, J., Ghinea, G., & Songonuga, V. N. (2013). Silver Surfers, E-government and the Digital Divide: An Exploratory Study of London Local Authority Websites and Older Citizens. *Interacting with Computers*, 25(6), 417-442.

Choudrie, J., & Vyas, A. (2014). Silver surfers adopting and using Facebook? A quantitative study of Hertfordshire, UK applied to organizational and social change. *Technological Forecasting & Social Change,* 89, 293-305.

Cohen, L., Manion, L., & Morrison, K. (2007). Research methods in education (6th Edition). London: *Routledge*.

Collins, H. (2010). Creative research: The theory and practice of research for the creative. *AVA Publishing.*

Conner, M., & Armitage, C. J. (1998). Extending the Theory of Planned Behavior: A Review and Avenues for Further Research\n. *Journal of Applied Social Psychology*, 28(15), 1429-1464.

Cooper, D., & Schindler, P. (2013). Business Research Methods, (12th Edition). *McGraw-Hill Higher Education*.

Cortez, C., Nussbaum, M., Woywood, G., & Aravena, R. (2009). Learning to collaborate by collaborating: a face-to-face collaborative activity for measuring and learning basics about teamwork. *Journal of Computer Assisted Learning*, 25, 126-142.

COSTA, PT., & MCCRAE, RR. (1992). Revised Neo Personality Inventory (Neo-Pi-R) and Neo Five-Factor Inventory (Neo-Ffi) Manual. *Psychological Assessment Resources, Odessa, FL.*

Creswell, J. W. (2012). Educational Research: Planning, conducting, and evaluating quantitative and qualitative research (4rd ed.). *Pearson Education, Inc.*

Crotty, M. (1998). The foundations of social research. London: *Sage*.

Czaja, S. J., & Schulz, R. (2006). Innovations in technology and aging introduction. *Generations,* 30(2), 6-8.

D

Dane, F.C. (1990) Research Methods Brooks/*Cole Publishing company*.

Data Collection Methods To Answer Evaluation Questions. (2015). Agency for Healthcare Research and Quality, U.S. Department of Health & Human Services. Available at: https://www.ahrq.gov/professionals/quality-patient safety/talkingquality/assess/collectionmethods.html [Accessed: Dec 2017].

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of

information technology. *MIS Quarterly*, 13(3), 319-339.

DEAN, G., Ivar, A.F., GOTTSCHALK, P., & Solli-sæther, H. (2008). Investigative Thinking and Creativity : An Empirical Study of Police Detectives in Norway. *International Journal of Innovation and Learning,* 5(2), 170–185.

DeLone, W.H., & McLean, E.R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3(1), 60-95.

DeLone, W.H., & McLean, E.R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4), 9–30.

Detschew, S. (2008). Impact of IT in the developing countries on the economic growth: implications derived from theory and empiricism, *GRIN Verlag.*

De Vaus, D.A. (1996). Surveys in social research. (4th edition). *Allen & Unwin Pty Ltd.*

DEUTSCH, M., & GERARD, HB. (1955). A study of normative and informational social influences upon individual judgment. *Journal of Abnormal and Social Psychology*, 51(3), 629–636.

Dillman, D.A. (2007). Mail and internet surveys: A tailored design method. *Second Edition John Wiley & Sons Inc.*

Dillman, D.A. (2011). Mail and Internet Surveys: The Tailored Design Method -- 2007 Update with New Internet, Visual, and Mixed-Mode Guide. *John Wiley & Sons.*

Dills, C.R., & Romiszowski, A.J. (1997). Instructional Development Paradigms. *Educational Technology Publications.*

Dillon, W.R., & Goldstein, M. (1984). Multivariate analysis methods and applications. *John Wiley & sons Inc*.

Donley, A.M., & Grauerholz, L. (2012). Research Methods: Student Handbook to Sociology (Volume II). *Infobase Publishing.*

Dorey, F. (2010). In Brief: The P Value: What Is It and What Does It Tell You?. *biomedical and life sciences journal literature,* 468(8), 2297-2298.

Dugdale, A., Daly, A. Papandrea, F., & Maley, M. (2005). Accessing e-government: challenges for citizens and organizations. *International Review of Administrative Sciences,* 71(1), 109-118.

Duncan, N. (2008). The adequacy of response rates to online and paper surveys: what can be done?. *Assessment & Evaluation in Higher Education*. 33(3), 301-314.

Dwivedi, Y. K., Khan, N., & Papazafeiropoulou, A. (2007). Consumer adoption and usage of broadband in Bangladesh. *Electronic Government: An International Journal*, 4, 299-313.

Dwivedi, Y. K., & Weerakkody, V. (2007). Examining the factors affecting the adoption of broadband in the Kingdom of Saudi Arabia. *Electronic Government: An International Journal*, 4, 43-58.

E

Easterby-Smith, M., Thorpe, R., & Lowe, A. (2006). Management Research: An introduction. 2nd Edition. *Sage Publications.*

Edmunds, H. (1999). The Focus Group Research Handbook. *McGraw-Hill Publishers*.

E-Government Program, (2006). The National e-Government Strategy and Action Plan, *Kingdom of Saudi Arabia*. Available at: https://www.yesser.gov.sa/EN/MechanismsandRegulations/Documents/National_E-Gov_Action_Plan_(F).pdf#search=MOI [Accessed: Nov 2015].

Eilers, M. (1989). Older Adults and Computer Education: Not to have a Closed Door. *International Journal of Technology and Aging.* 2(1), 57-76.

Ernest, P. (1994). An Introduction to research methodology and paradigms. RSU. School of Education, *University of Exeter.*

Etikan, I., & Bala, K. (2017). Sampling and Sampling Methods. *Biometrics & Biostatistics International Journal*, *5*(6), 5-7.

Etikan, I., Musa, S.A., & Alkassim, R.S. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, *5*(1), 1-4.

Experiment Resources, (2012). Non- probability sampling. Available at: http://www.experiment-resources.com/non- probability-sampling.html [Accessed: May 2015].

F

Fade, S. (2005). Learning and Assessing through Reflection. Available at: http://www.practicebasedlearning.org/resources/materials/docs/RoyalBromptonV3.pdf [Accessed: Aug 2018].

Fang, Z. (2002). E-Government in Digital Era: Concept, Practice, and Development, 10(2), 1-22. Available at: http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan016377.pdf [Accessed: July 2016].

Feist, G., & Rosenberg, E. (2010). Psychology: Making Connections. *McGraw-Hill.*

Fenton, S. J., & Draper, H. (2014). Older people make a huge contribution to society. Some communities and faith groups draw on this contribution in responding to the needs

of all their members. *Birmingham Policy Commission*.

Fishbein, M., & Ajzen, I. (1975). Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research. *Addison-Wesley, Reading,* MA.

Friedkin, Ne. (2010). The attitude-behavior linkage in behavioral cascades. *Social Psychology Quarterly*. 73(2), 196-213.

Flavia´n , C., Guinal´ıu , M., & Gurrea, R. (2006). The role played by perceived usability, satisfaction and consumer trust on website loyalty. *Information & Management ,* 43, 1-14.

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(2), 39-50.

Fowler, F.J. (2002). Survey research methods (3rd Edition). *SAGE Publications Inc.*

Freeman, I., & Hasnaoui, A. (2010). Information and Communication Technologies (ICT): A Tool to Implement and Drive Corporate Social Responsibility (CSR) Technologies de l'Information et de Communication : un outil pour implémenter et véhiculer la responsabilité sociale des entreprises (RSE). Available at: https://halshs.archives-ouvertes.fr/hal-00495968/document [Accessed: Dec 2017].

Friedman, A. (2008). Framework for evaluating impacts of informal science education projects. Arlington, VA: *National Science Foundation*.

G

Gefen, D., Karahanna, E., & Straub, D.W. (2003). Trust and TAM in online shopping: an integrated model. *MIS Quarterly,* 27(1), 51–90.

Gefen, D., Rose, G. M., Warkentin, M., & Pavlou, P.A. (2005). Cultural diversity and trust in IT adoption: a comparison of USA and South African e-voters. *Journal of Global Information Management*, 13(1), 54-78.

Geissler, G., Zinkhan G., & Watson R. (2001). Web Homepage Complexity and Communication Effectiveness. *Journal of the Association for Information Systems*. 2(2), 1-46.

Gilbert, N. (2001). Researching Social Life. *Sage Publications, London.*

Gill, P., Stewart, K., Treasure, E., & Chadwick, B. (2008). Methods of data collection in qualitative research: interviews and focus groups. Nature Publishing Group. *British Dental Journal*, 204(6), 291–295.

Glesne, C. (2006). Becoming qualitative researchers: An introduction (3rd Edition). Boston: MA*: Pearson Education, Inc.*

Gratton, C., & Jones, I. (2010). Research methods for sports studies. *Taylor & Francis*.

Gravetter, F.J., & Wallnau, L.B. (2009). Statistics for the behavioural sciences (8th Edition). *Wadsworth CENGAGE Learning.*

GRAY, D.E. (2013). DOING RESEARCH in the REAL WORLD (3rd edition). *SAGE.*

Grazioli, S., & Jarvenpaa, S.L. (2000). Perils of internet fraud: an empirical investigation of deception and trust with experienced internet consumers. *IEEE Transactions on Systems, Man, and Cybernetics-Part A: Systems and Humans,* 30(4), 395–410.

Gregoire, Y., & Fisher, R.J. (2006). The effects of relationship quality on customer retaliation. *Market Lett,* 17, 31-46.

Gregor, S., Imran, A., & Turner, T. (2014). A 'sweet spot change strategy for a least developed country: leveraging e-Government in Bangladesh. *European Journal of Information Systems*. 23(6), 655-671.

Grix, J. (2004). The foundations of research. London: *Palgrave Macmillan.*

Guo, B., Aveyard, P., Fielding, A., & Sutton, S. (2008). Testing the Convergent and Discriminant Validity of the Decisional Balance Scale of the Transtheoretical Model Using the Multi-Trait Multi-Method Approach. *Psychology of Addictive Behaviors*, 22(2), 288 –294.

H

Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (1998). Multivariate data analysis (5th Edition). *Prentice Hall Inc.*

Hall, B. H., & Khan, B. (2002). Adoption of New Technology. *New Economy Handbook.*

Hart, C. (1998), Doing a literature review. *SAGE publications.*

Hanson, V. (2009). Age and Web Access: The Next Generation. *Proceedings of the 2009 International Cross-Disciplinary Conference on Web Accessibility* (W4A). 7-15.

Hamner, M., & Al-qahtani, F. (2009). Enhancing the case for Electronic Government in developing nations : A people-centric study focused in Saudi Arabia. *Government Information Quarterly*, 26(1), 137-143.

Haviland, W.A., Harald, E.L., Walrath, D., & McBride, B. (2010). The Essence of Anthropology. *Wadsworth, CENGAGE Learning.*

Heart, T., & Kalderon, E. (2013). Older adults: Are they ready to adopt health-related ICT?. *International journal of medical informatics,* 8 (2), e209-e231.

Heeks, R. (2006). Understanding and Measuring eGovernment: International Benchmarking Studies. Paper prepared for *UNDESA workshop*, E-Participation and E-Government: Understanding the Present and Creating the Future, Budapest, Hungary.

Hennink, M. (2014). Focus group discussions. *New York, NY: Oxford University Press.*

Henseler, J., Ringle, C. M., & Sinkovics, R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing*, 20, 277–319.

Hinton, P.R., Brownlow, C., McMurray, I., & Cozens, B. (2004). SPSS explained. East Sussex, England: *Routledge Inc*.

Hohwü, L., Lyshol, H., Gissler, M., Jonsson, SH., Petzold, M., & Obel, C. (2013). Web-Based Versus Traditional Paper Questionnaires: A Mixed-Mode Survey With a Nordic Perspective. *Journal of Medical Internet Research*. 15(8), e173.

Holloway, R. E. (1977). Perceptions of an Innovation: Syracuse University Project Advance. Unpublished Doctoral Dissertation, *Syracuse University*.

Hovland, C., Janice, L., & Kelley, H. (1953). Communication and Persuasion. *Yale University Press*, New Haven, CT.

Howard, M. (2001). e-Government Across the Globe: How Will "e" Change Government?. *GOVERNMENT FINANCE REVIEW*. 6-9.

Huart, J., Kolski, C., & Sagar, M. (2004). *Evaluation of multimedia applications using inspection methods: The Cognitive Walkthrough case*. *Interacting with Computers*, 16, 183-215.

Hultman, J. (2004), Technology adoption and embeddedness. *20th Annual IMP Conference*.

Hwang, J. (2006) THESIS: Deconstructing the discourse of the global digital divide in the age of neo-liberal global economy. *Pennsylvania State University.*

I

Information daily. (2006). e-Government, public services and older people. Available at: <http://www.theinformationdaily.com/2006/07/17/e-government-public-services-and-older-people> [Accessed: 3 Jun 2015].

INSKO, C. (1967). Theories of Attitude Change. Appleton Century Crofts, *New York.*

International Telecommunication Union. (2017), ICT Facts and Figures. Available at: https://www.itu.int/en/ITUD/Statistics/Documents/facts/ICTFactsFigures2017.pdf [Accessed: Jan 2018].

J

Jain Palvia, S. C., & Sharma, S. S. (2007). E-Government and E-Governance:

Definitions/Domain Framework and Status around the World. Available at: http://www.iceg.net/2007/books/1/1_369.pdf [Accessed: Oct 2015].

Johanson, G. A., & Brooks, G. P. (2010). Initial Scale Development: Sample Size for Pilot Studies. *Educational and Psychological Measurement*, *70*(3), 394–400.

Jupp, V. (2006). The Sage dictionary of social research methods. *Sage Publications Ltd.*

K

Kantner, L., & Rosenbaum, S. (1997). Usability studies of WWW sites: Heuristic evaluation vs. laboratory testing. *Proc. SIGDOC, Snowbird, UT*, 153-160.

Karlin, N.J., Weil, J., & Felmban, W. (2016). Aging in Saudi Arabia: An Exploratory Study of Contemporary Older Persons' Views About Daily Life, Health, and the Experience of Aging. *Gerontology & Geriatric Medicine*, 1-9.

Kawulich, B.B. (2005), Participant Observation as a Data Collection Method, *Forum*: *Qualitative Social Research,* 6(2).

Khajouei, R., Zahiri Esfahani, M., & Jahani, Y. (2017). Comparison of heuristic and cognitive walkthrough usability evaluation methods for evaluating health information systems. *Journal of the American Medical Informatics Association*, 24(e1), e55-e60.

Kim, D. Ferrin, D. & Rao, R. (2008). A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decision Support Systems,* 44(2), 544-564.

Kim, H.Y. (2017). Statistical notes for clinical researchers: Chi-squared test and Fisher's exact test. *Restor Dent Endod*. 42(2), 152–155. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5426219/ [Accessed: Jan 2018].

Klabi, H., Mellouli, S., & Rekik, M. (2016). A reputation based electronic government procurement model. *Government Information Quarterly*. In Press.

Klotz. R.J. (2004). The politics of Internet communication. *Rowman & Littlefield Publishers Inc.*

Kolb, A.Y., & Kolb, D.A. (2005). Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education. *Academy of Management Learning and Education*. 4(2), 193–212.

Kolb, D.A. (1984). Experiential Learning: Experience as the Source of Learning and Development. *New Jersey: Englewood Cliffs, Prentice-Hall*.

Kothari, C.R. (2004). Research methodology; Methods and Techniques. *New Age International Ltd Publishers.*

Krejcie, R.V., & Morgan, D.W. (1970). Determining sample size for research activities. *Educational and psychological measurement,* 30, 607- 610.

Kroeker, K.L. (2010). Engineering the web`s third decade. *Association for Computing Machinery,* 53(3), 16-18.

Krug, W.T. (2010), Encyklopädisches Lexikon in Bezug auf die neueste Literatur und Geschichte der Philosophie. Leipzig: *Nabu Press*.

Kuri, N.P. (1998). Kolb's learning cycle: an alternative strategy for engineering education. *Proceedings of the International Conference on Engineering Education,* 225-230.

Kurfalı, M., Arifoglu, A., Tokdemir, G., & Paçin, Y. (2017). Adoption of e-government services in Turkey. *Computers in Human Behavior,* 66. 168-178.

L

Lahaut, V., Jansen, H., Mheen, D., & Garretsen, H. (2002). NON-RESPONSE BIAS IN A SAMPLE SURVEY ON ALCOHOL CONSUMPTION. *Alcohol and Alcoholism*, 37 (3), 256-260.

Lawshe, C. (1975). A quantitative approach to content validity. *Personnel Psychology*, 28, 563-575.

Lee, B., Chen, Y., & Hewitt, L. (2011). Age Differences in Constraints Encountered by Seniors in their use of Computers and the Internet. *Computers in Human Behavior,* 27. 1231-1237.

Lee, R.M. (1993). Doing Research on Sensitive Topic, *London: Sage*.

Levine, T.R., & Kotowski, M.R. (2010). Measuring argumentativeness and verbal aggressiveness; psychometric concerns and advances Cited in: Avtgis, T.A.,& Rancer, A.S. (2010). Arguments, aggression and conflict new directions in theory and research. *Taylor & Francis.*

Lewis, C. H. (1982). Using the "Thinking Aloud" Method In Cognitive Interface Design (Technical report). *IBM. RC-9265.*

Liu, C., & Arnett, K. P. (2000). Exploring the factors associated with web site success in the context of electronic commerce. *Information & Management*. 38, 23-33.

Lin, J-J., Chang, C-H., & Pal, N. (2015). A Revisit To Contingency Table And Tests Of Independence: Bootstrap Is Preferred To Chi-Square Approximations As Well As Fisher's Exact Test. *Journal of Biopharmaceutical Statistics*. 25, 438-458.

Lockstrom, M. (2007). Low-cost country sourcing – Trends and implications. *Deutscher Universitats-Verlag | GWV Fachverlage GmbH*|.

Lorge, I. (1936). Irrevelant rewards in animal learning. *Journal of Comparative Psychology.* 21(1), 105-128.

Lowry, P.B., & Gaskin, J. (2014). Partial Least Squares (PLS) Structural Equation Modeling (SEM) for Building and Testing Behavioral Causal Theory: When to Choose It and How to Use It. *IEEE Transactions on Professional Communication,* 57(2), 123–146.

Luqman, A., & Abdullah, N.K. (2011). E-business adoption amongst SMEs: A structural equation modeling approach. *JIBC.* 16(2).

M

MacKenzie, D., & Wajcman, J. (1985). The Social Shaping of Technology: How the Refrigerator Got Its Hum, Milton Keynes: *Open University Press*.

Maskus, K. E. (2004). Encouraging International Technology Transfer UNCTAD-ICTSD Project on IPRs and Sustainable Development Intellectual Property Rights and Sustainable Development. Available at: https://www.iprsonline.org/resources/docs/Maskus - Encouraging International ToT- Blue 7.pdf [Accessed: Jan 2015].

Manzoor, A. (2014). Investigating the factors affecting residential consumer adoption of broadband in India. *SAGE Open*. Available at: http://doi.org/10.1177/2158244014556998 [Accessed 2 Jan. 2018].

Marsden, P.V., & Wright, J.D. (2010). Handbook of survey research (2nd edition). *Emerald Group Publishing Limited.*

Maxwell, S. E. (2000). Sample size and multiple regression analysis. *Psychological Methods*, 5(4), 434-58.

Meijer, A. (2015). E-governance innovation: Barriers and strategies. *Government Information Quarterly,* 32, 198–206.

Menard, S. (2002). Longitudinal Research. Series: Quantitative Applications in the Social Sciences. 2nd Edition. *Sage Publications.*

McDonald, J.H. (2014). Handbook of Biological Statistics (3rd ed.). *Sparky House Publishing*, Baltimore, Maryland. Available at: http://www.biostathandbook.com/fishers.html [Accessed Jan. 2018].

McKnight, D.H., Choudhury, V. & Kacmar, C. (2002). Developing and validating trust measures for e-commerce: an integrative approach. *Information Systems Research.* 13(3), 334–359.

McKnight, H., & Chervany, N. L. (2001), Trust and Distrust Definitions: One Bite at a Time. *Trust in Cyber-societies*, 27-54|.

McLeod, S. (2015). Skinner - Operant Conditioning. *Simply Psychology*. Available at: https://www.simplypsychology.org/operant-conditioning.html [Accessed: June 2017].

McNabb, D.E. (2010). Research methods for political science (2nd edition). Quantitative and Qualitative Approaches. *M.E Sharpe Inc.*

Miles, J., & Gilbert, P. (2005). A Handbook of Research Methods for Clinical and Health Psychology. *Oxford University Press*.

Miles, M. B., & Huberman, M. A. (1994). Qualitative Data Analysis: An Expanded Sourcebook" (2nd edition). *Beverley Hills, Sage.*

Minton, E., & Khale, L.R. (2014). Belief Systems, Religion, and Behaviour al Economics. New York: *Business Expert Press LLC*. *ISBN* 978-1-60649-704-3.

Morris, M.G., Venkatesh, V., & Ackerman, P.L. (2005). Gender and age differences in employee decisions about new technology: An extension to the theory of planned behaviour *IEEE transactions on engineering management,* 52(1).

Moore, G., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2, 173-191.

Moser, C.A., & Kalton, G. (1971). Survey methods in social investigation. *Dartmouth publishing company limited.*

Munro, B.H. (2005). Statistical methods for health care research (5th Edition). *Lippincott Williams & Wilkins.*

Myers, M.D. (1997). Qualitative research in information systems. *MIS Quarterly,* 21(2), 241-242.

N

Nadkarni, C., & Gupta, R. (2007). A Task-Based Model of Perceived Website Complexity.
MIS Quarterly, 31(3), 501-524.

National Centre for Social Research. (2001). National Statistics: Family Resource Survey. *London: Office for National Statistics.*

Neves, B. B., & Amaro, F. (2012). Too old for technology? How the elderly of Lisbon use and perceive ICT. *The Journal of Community Informatics.* 8(1).

Newsted, P.R., Huff, S.L., & Munro, M.C. (1998). Survey instruments in information systems. *MIS Quarterly,* 22 (4), 553-554.

Niehaves, B., & Plattfaut, R. (2014). Internet adoption by the elderly: employing IS technology acceptance theories for understanding the age-related digital divide. *European Journal of Information Systems*, 23(6), 708-726.

Nielsen, J. (1994). Heuristic evaluation. Usability Inspection Methods. *John Wiley and Sons, New York*, 25-62.

Norris, D. F., Fletcher, P. D., & Holden, S. H. (2001). Is your local government plugged in? Highlights of the 2000 electronic government survey. Washington, DC: *International City/County Management Association.*

North, M. S., & Fiske, S. T. (2015). Modern Attitudes Toward Older Adults in the Aging World: A Cross-Cultural Meta-Analysis. *Psychological Bulletin*, 141(5), 993-1021.

O

Odum, H.W., & Jocher, K. (1929). An Introduction to Social Research, *New York: Henry Holt and Co.*

Ooi, K.-B., Sim, J.-J., Yew, K.-T., & Lin, B. (2011). Exploring factors influencing consumers' behavioral intention to adopt broadband in Malaysia. *Computers in Human Behavior*, 27,1168-1178.

Orlikowski, W.J., & Baroudi, J.J. (1991). Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research* (2), 1-28.

ORMROD, JE. (1999). Human Learning. Prentice-Hall, *Upper Saddle River, NJ*.

Ozkan, S., & Kanat, I.E. (2011). e-Government adoption model based on theory of planned behavior: Empirical validation. *Government Information Quarterly,* 28, 503-513.

P

Panneerselvam, R. (2004). Research Methodology. *Prentice-Hall of India.*

Pavlou, P. (2003). Consumer acceptance of electronic commerce: integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce,* 7(3), 69–103.

Peek, S. T. M., Luijkx, K. G., Rijnaard, M. D., Nieboer, M. E., Van Der Voort, C. S., Aarts, S., & Wouters, E. J. M. (2016). Older Adults' Reasons for Using Technology while Aging in Place. *Gerontology*, 62(2), 226-237.

Peterson, R. A., & Kim, Y. (2013). On the relationship between coefficient alpha and composite reliability. *The Journal of Applied Psychology*, 98(1), 194-8.

Phang, C. W., Li, Y., Sutanto, J., & Kankanhalli, A. (2005). Senior citizens' adoption of Egovernment: In quest of the antecedents of perceived usefulness. *In Proceeding of the 38th Hawaii International conference on system science*, 1-8.

Politz, A., & Simmons, W. (1949), An Attempt to Get the "Not at Homes" into the Sample Without Callbacks. *Journal of The American Statistical Association*, 44(245), 9-16.

Polson, PG., Lewis, C., Rieman, J., & Wharton, C. (1992). Cognitive walkthroughs: a method for theory-based evaluation of user interfaces. *Int J Man-machine Stud*, 36(5):741-773.

Popper, K. (1959). The logic of scientific discovery. London: *Routledge*.

Porumbescu, G. A. (2016). Linking public sector social media and e-government website use to trust in government. *Government Information Quarterly*, 33, 291-304.

Punch, K.F. (2005). Introduction to Social Research–Quantitative & Qualitative Approaches. *London: Sage*.

R

Rana, N. P., & Dwivedi, Y. K. (2015). Citizen's adoption of an e-government system: Validating extended social cognitive theory (SCT). *Government Information Quarterly*. 32, 172-181.

Rajasekar, S., Philominathan, P., & Chinnathambi, V. (2013). Research Methodology. *Cornell University Library*. Available at: https://arxiv.org/pdf/physics/0601009.pdf [Accessed Dec: 2017].

Reffat, R. (2003). Developing a Successful E-Government, (Working Paper): *University Of Sydney, Australia.*

Rempel, J. K., Holmes, J. G., & Zanna, M. P. (1985). Trust in close relationships. *J. Personality Soc. Psych*. 49(1) 95-112.

Robertson, P.L., & Jacobson, D. (2011). Knowledge transfer and technology diffusion. *Edward Elgar Publishing Limited.*

Robson, C. (2002). Real world research (2nd Edition). *Blackwell Publishers Ltd.*

Rogers, E. M. (1983). Diffusion of Innovations. *Free Press, New York.*

Rogers, E. M. (1995). Diffusion of Innovations. *Free Press, New York.*

Rogers, E. M. (2003). Diffusion of Innovations. *Free Press, New York.*

Rossman, G. B., & Rallis, S. F. (1998). Learning in the field: An introduction to qualitative research. Thousand Oaks: CA: *Sage Publications, Inc.*

Rotter, J. B. (1971). Generalized expectancies for interpersonal trust. *Amer. Psychologist,* 26(5), 443-452.

Rowntree, D. as cited in Allin & Turnock. (1988). Exploring Open and Distance Learning. *Routledge*.

Rubin, A., & Babbie, E. (2011). *Research methods for social work*. seventh ed. Belmont, CA: *New York: Longman Publishers*.

Rubin, H. J., & Rubin, I. S. (1995). Qualitative interviewing: The art of hearing data. *Thousand Oaks, CA: Sage.*

S

Saudi General Authority for Statistics. (2016). Demographic Survey. Available at: https://www.stats.gov.sa/sites/default/files/ar- demographic-research-2016_5.pdf. [Accessed: Jan 2018].

Saudi General Department of Passports. (2017). Passports Electronic Services. Available at: http://www.gdp.gov.sa/sites/pgd/ar-sa/%D8%A3%D8%A8%D9%80%D8%B4%D8%B1/pages/default.aspx [Accessed: Dec 2017].

Saudi National Portal, (2017). Service Usage Statistics. Available at: https://goo.gl/FnfPQG [Accessed: Dec 2017].

Saunders, E. J. (2004). Maximizing computer use among the elderly in rural senior centers. *Educational Gerontology*, 30(7), 573-585.

Saunders, M., Lewis, P., & Thornhill, A. (2009). Research methods for business students. London: *Pearson Education Limited.*

Schuppan, T. (2008). E-Government in developing countries: Experiences from sub-Saharan Africa. *Government Information Quarterly*, 26, 118-127.

Scotland, J. (2012). Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms. *English Language Teaching*, *5*(9), 9-16.

Shapiro, S.P. (1987). The social control of impersonal trust. *American Journal of Sociology*, 93(3), 623-658.

Sharma, R., & Mishra, R. (2015). A Review of Evolution of Theories and Models of Technology Adoption. *Indore Management Journal*, 6(2), 17-29.

Sharma, P. N., & Kim, K. H. (2012). MODEL SELECTION IN INFORMATION SYSTEMS RESEARCH USING PARTIAL LEAST SQUARES BASED STRUCTURAL EQUATION MODELING. *International Conference on Information Systems.*

Sharma, S. K. (2015). Adoption of e-government services: The role of service quality dimensions and demographic variables. *People, Process and Policy.* 9(2), 207-222.

Sipior, J., Ward, B., & Connolly, R. (2011). The digital divide and t-government in the United States: using the technology acceptance model to understand usage. *European Journal of Information Systems* 20, 308-328.

Skinner, B. F. (1938). The Behavior of organisms: An experimental analysis. *New York: Appleton-Century.*

Smyth, R. (2004). Exploring the Usefulness of a Conceptual Framework as a Research Tool: A Researcher's Reflections. *Issues In Educational Research*, 14.

Stanley, D. (2011). 4 Kinds of Survey Error: Sampling, Measurement, Coverage and Non-Response. *Researchaccess*. Available at: http://researchaccess.com/2011/11/4-kinds-of-survey-error-sampling-measurement-coverage-nonresponse/ [Accessed Feb: 2018].

Statistical Office of the United Nations, (1984). Handbook of Household Surveys, Revised Edition: Studies in Methods, Series F, No. 31, *United Nations, New York.* Available at: https://unstats.un.org/unsd/publication/SeriesF/SeriesF_31E.pdf [Accessed Feb: 2018].

Statista. (2017). Number of Internet users worldwide from 2005 to 2017 (in millions). Available at: https://www.statista.com/statistics/273018/number-of-internet-users-worldwide/ [Accessed: Jan 2018].

Stanford Encyclopaedia of Philosophy. (2015). Relativism. Available at: https://plato.stanford.edu/entries/relativism/ [Accessed March. 2017].

Stern, E. (2005). Evaluation Research Methods – Volume 1, *SAGE Publications Ltd*.

Stewert, D.W. (1984). Secondary research: information sources and methods. *SAGE Publications Inc.*

Stoneman, P. (1976). Technological Diffusion and the computer revolution: The UK Experience. *Cambridge University Press.*

Straub, E. T. (2009). Understanding Technology Adoption: Theory and Future Directions for Informal Learning. *Review of Educational Research*, 79(2), 625-649.

Szyjka, S. (2012). Understanding research Paradigms : Trends in Science Education Research, *Problems of Education In The 21st century*. 43, 110-118.

T

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, *2*, 53-55.

Taylor, S.J., Bogdan, R., & Devault, M.L. (2015). Introduction to Qualitative Research Methods : A Guidebook and Resource. *John Wiley & Sons.*

Teo, T.S.H. (2001). Demographics and motivation variables associate with internet usage activities. *Internet research: Electronic networking applications and policy,* 11(2),125-137.

Teo.T.S.H., Lim.V.K.G., & Lai.R.Y.C. (1999). Intrinsic and extrinsic motivation in Internet usage. *Omega Int. Journal of management science,* 25-37.

Thabane, L., Ma, J., Chu, R., Cheng, J., Ismaila, A., Rios, L. P., Robson, R., Thabane, M., Giangregorio, L., & Goldsmith, C. H. (2010). A tutorial on pilot studies: the what, why and how. *BMC Medical Research Methodology*, 1-10.

Thompson. R.L., Higgins. C.A., & Howell. J.M. (1991). Personal Computing: Toward a conceptual model of utilization. *MIS Quarterly,* 15(1), 125-143 .

Tornatzky, L., & Klein, K. (1982). Innovation characteristics and innovation adoption implementation: a meta- analysis of findings. *IEEE Transactions on Engineering Management*, 29, 28-45.

Trochim, W.K.T., & Donnelly, J.P. (2008). The research methods knowledge base (3nd Edition). *Atomic Dogg CENGAGE Learning.*

Turner, P., Turner, S., & Van de Walle, G. (2007). How older people account for their experiences with interactive technology. *Behaviour & Information Technology*, 26(4), 287-296.

U

UK National Statistics, (2006). General Household Survey: Sampling Errors. Available at: file:///Users/adelalfalah/Downloads/appendixc2006_tcm77-247891.pdf [Accessed May: 2018].

UNESCO, (2002), Information and communication technology in education. Available at: http://unesdoc.unesco.org/images/0012/001295/129538e.pdf [Accessed Jun: 2015].

United Nations Department of Economic and Social Affairs, (2016), United Nations E-government Survey: E-government in Support of Sustainable Development. Available at: http://workspace.unpan.org/sites/Internet/Documents/UNPAN97453.pdf [Accessed: Feb 2018].

United Nations Population Division, (2017). World Population Prospects: The 2017 Revision, Key Findings and Advance Tables. Available at: https://esa.un.org/unpd/wpp/Publications/Files/WPP2017_KeyFindings.pdf [Accessed: Jan 2018].

United Nations Statistics Division, (2014). Households and families. Available at: <http://unstats.un.org/unsd/demographic/sconcerns/fam/fammethods.htm>. [Accessed: Sep 2016].

University of Southampton, (2007). eResearch Methods: Aims and Objectives. Available at: http://www.erm.ecs.soton.ac.uk/theme4/aims_and_objectives.html [Accessed: November 2017].

Urbach, N., & Ahlemann, F. (2010). Structural Equation Modeling in Information Systems Research Using Partial Least Squares. *Journal of Information Technology Theory and Application,* 11(2), 5-40.

V

Van Biljon, J., Van Dyk, T., & Gelderblom, H. (2010). Mobile phone adoption: Optimising value for older adults in a developing country. Available at: http://uir.unisa.ac.za/bitstream/handle/10500/5396/OptimizingValueOlderAdults_IDIA2010.pdf?sequence=1&isAllowed=y [Accessed: Sep 2017].

Van Deursen, A. J. A. M., & Van Dijk, J. A. G. M., (2011). Internet skills and the digital divide. *New media and society,* 13(6), 893-911.

Van Slyke, C., Be´langer, F., & Comunale, C. (2004). Adopting business-to-consumer electronic commerce: the effects of trust and perceived innovation characteristics. *The Data Base for Advances in Information Systems*, 35 (2), 32-49.

Venkatatesh, V., & Brown, S. (2001). A Longitudinal Investigation of Personal Computers in Homes: Adoption Determinants and Emerging Challenges. *MIS Quarterly*, 25(1), 71-102.

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information systems research,* 11(4), 342-365.

VENKATESH, V., & MORRIS, MG. (2000a). Why don't mean stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly,* 24(1), 115-139.

Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.

Vyas, A. (2013). Adoption, Use and Diffusion of Online Social Networks in the Older Population: a UK Perspective, *A Thesis for Doctorate of Philosophy*.

W

Wahab, S. A., Rose, R. C., Idayu, S., & Osman, W. (2012). Defining the Concepts of Technology and Technology Transfer: A Literature Analysis. *International Business Research*, *5*(1).

Walliman, N. (2011). Research Methods: The Basics. *Taylor & Francis e-Library*.

Walliman, N. (2001). Your research project: a step-by-step guide for the first-time researcher. *SAGE Publication Ltd.*

Flavia´n , C., Guinal´ıu , M., & Gurrea, R. (2006). The role played by perceived usability, satisfaction and consumer trust on website loyalty. *Information & Management , 43*, 1-14.

McLeod, S. (2015). *Skinner - Operant Conditioning*. Retrieved 2018 from simply psychology: https://www.simplypsychology.org/operant-conditioning.html

World Bank (2015). e-Government**,** Available at: http://www.worldbank.org/en/topic/ict/brief/e-government [Accessed: July 2016].

Wright, K.B. (2005). Researching Internet-Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages, and Web Survey Services. *Journal of Computer-Mediated Communication*, 10(3).

Y

Yaghmaie, F. (2003). Content validity and its estimation. *Journal of medical education.* 3(1), 25-27.

Z

Zait, A., & Bertea, P. (2011). Methods for testing discriminant validity. *Management and Marketing*, 9(2), 8.

Zikmund, W.G., Babin, B.J., Carr, J.C., & Griffin, M. (2009). Business Research Methods. *South-Western Cengage Learning*.

Zucker, L.G. (1986). Production of trust: institutional sources of economic structure, 1840–1920. *Research in Organizational Behavior*, 8, 53-111.

Appendices

Appendix 2-1 Literature Review Table

Technology Adoption / Digital Divides/ Older Adults					
Publication	**Year**	**Author(s)**	**Vol/No/Pages**	**Article Title**	**Aims/Methods/Findings**
International Journal of Emerging Technologies in Learning.	2018	Kashada, A. Li, H. Koshadah, O.	Vol. 13 (2), p. 48-59	Analysis Approach to Identify Factors Influence Digital Learning Technology Adoption and Utilization in Developing Countries	A quantitative study aimed to examine the impact of top management on successful adoption of digital learning technologies in a developing country, namely Libya. After analysing the data of 210 participants, it was found that among other factors, the use and awareness of digital learning technologies could be promoted by top management engagement.
Research Policy	2018	Kämpfen, F. Maurer, J.	Vol. 47(6), p. 1125-1132	Does education help "old dogs" learn "new tricks"? The lasting impact of early-life education on technology use among older adults	The study examines the influence of education on elderlies' acceptance and use of PC and Internet in the context of Europe, specifically Italy. Using already existing substantial survey on compulsory schooling as instrumental variable, it was found that early-life education remarkably affects adoption of elderlies' acceptance and use of PC and Internet on the long run.
Decision Support Systems	2016	Chakraborty, R. Lee, J. Bagchi-Sen, S. Upadhyaya, S. Raghav Rao, H.	83, p. 47-56	Online shopping intention in the context of data breach in online retail stores: An examination of older and younger adults	It is an e-commerce study that investigated the intentions of participants with regards to online shopping in USA who belonged to two age categories (<55) and older (>55). Data was gathered from 159 younger old citizen and 205 older citizens using online surveys after a major online security breach. Findings revealed that the acuity of a hacking event is influenced by perceived online risk for both age bands with more intensity for older citizens.
Proceedings of PICMET '16: Technology Management for Social Innovation	2016	Aldhaban, F. Daim, T. U. Harmon, R.	p. 2922-2930	Exploring the Adoption and Use of the Smartphone Technology in Emerging Regions: Case of Saudi Arabia	A quantitative study that adopted UTAUT and used random sampling for a web-based survey (641 responses) to uncover aspects surrounding acceptance & use of smartphone technology is Saudi Arabia. Findings showed performance expectancy (e.g. battery life), effort expectancy (e.g. simplicity), perceived enjoyment and social influence do influence both; intentions and actual use of smartphones.

Gerontology	2016	Peek, S. T. M. Luijkx, K. G. Rijnaard, M. D. Nieboer, M. E. Van Der Voort, C. S. Aarts, S. Wouters, E. J. M.	Vol. 62(2), p. 226-237	Older Adults' Reasons for Using Technology while Aging in Place	Aging at home was the context of a study conducted in the Netherlands to discover what influences older adults' adoption of diverse technologies at their households. A qualitative approach led to find that factors, such as independent living difficulties, personal perception about technology, social and organisational network impact, behavioural options, and the physical environment play vital roles on the level of technology use by community-dwelling elderly. The study recommended that to achieve successful use of technology by the independent older adults at their homes, all involved constituencies should be aware of the abovementioned psychological and contextual elements.
Communications of the IBIMA	2015	Mardikyan, S. Yıldız, E. A. Ordu, M. D. Şimşek, B.	Vol. 2015 p.1-43	Examining the Global Digital Divide: A Cross-Country Analysis	Global digital divide was examined in this article by conducting a cross-country analysis. International Telecommunication Union's (ITU) ICT key indicators were adopted to measure the global digital divide. The cross-sectional data are collected for 145 countries. It was found that income & development degrees were of major association with digital divide as well as the continental differences between countries in terms of being a member of the Organization for Economic Cooperation and Development (OECD).
Center for Technology Innovation at Brookings	2015	West, D.M	p. 1-30	Digital divide: Improving Internet access in the developing world through affordable services and diverse content	This article provides insights into the factors contributing to the existing digital divide worldwide with a specific concentration on the context of the developing world. It recommends the provision of affordable Internet capabilities, variety of contents, robust ICT infrastructure, transparent information & translation tools. Bridging the divide will contribute to economic growth, enhanced education quality & improved health care services.
Health Informatics Journal	2015	Berner, J. Rennemark, M. Jogréus, C. Anderberg, P. Sköldunger, A. Wahlberg, M. Elmståhl, S. Berglund, J.	Vol. 21(3) p. 237–249	Factors influencing Internet usage in older adults (65 years and above) living in rural and urban Sweden	A mixed method investigation into the factors influencing Internet usage by older adults over the age of 59 in Sweden. Applying Logistic regression revealed that Internet use in urban regions is higher that rural counterparts. Better health, younger age and higher education were also significant.

European Journal of Information Systems	2015	Chen, R. Sharma, S.K.	Vol. 24, p. 93-106	Learning and self-disclosure behavior on social networking sites: the case of Facebook users	A quantitative paper that aimed to explore how the attitude of Facebook users is formed in terms of the influence of site usage rate & self-disclosure via the application of the theoretical lens of learning theories. After collection and analysing 822 responses, learning theories were confirmed to have impact on attitude formation. Site usage rate also indicated importance in mediating the links between attitude & self-disclosure extent.
Poetics	2015	Lissitsa, S. Chachashvili-Bolotin, S.	Vol. 52, p. 44-63	Does the wind of change blow in late adulthood? Adoption of ICT by senior citizens during the past decade	Exploiting already existing comprehensive social survey in Israel, this paper explored the changes in elderlies' usage rate of Internet over a decade (from2003–2012). It was found that there was an increase in Internet usage by senior citizens, but the gap between younger and older citizens still exists. It has in fact marginally risen.
Indore Management Journal	2015	Sharma, R. Mishra, R.	Vol. 6(2), p. 17-29	A Review of Evolution of Theories and Models of Technology Adoption	This article dives deep into the different theories and models that have been developed throughout the years to study the venue of technology adoption. Towards the end, the article calls on IS researchers to develop new theories containing novel factors to tackle arising issues within the venue of technology adoption.
European Journal of Information Systems	2014	Niehaves, B. Plattfaut, R.	Vol. 23(6) p. 708-726	Internet adoption by the elderly: employing IS technology acceptance theories for understanding the age-related digital divide.	This document examines the intentions of the older adults to using Internet and detects principal influencing elements. 100 elderly people were engaged in telephone interviews and 150 complete surveys received from participants aged 65 or over. Results proof that variables such as, income, education, gender, and age are critical determination factors. There has also been a contribution to digital divide research in which constructs of beliefs & traits were offered. Results also showed that older adults are not homogenous as age still plays a vital controlling impact.
SAGE Open	2014	Manzoor, A.	p. 1-17	Investigating the factors affecting residential consumer adoption of broadband in India	Exploring factors influencing behavioural intentions in terms of broadband adoption in India, it was posited that self-efficacy, facilitating conditions, ease of use, service quality and hedonic outcomes were all decisive aspects. The study was based upon TPB, DOI and MATH.

Pew Research Canter	2014	Smith, A	p. 1-27	Older adults and technology use	A qualitative older adults technology adoption study that interviewed 1,526 senior residents (65+) in the USA. Results posited that although seniors are becoming less reluctance in terms of technology use, a digital divide still exists compared to younger counterparts. It also found that the use of Broadband and the Internet is less widespread among seniors compared to cell phones technologies.
Birmingham Policy Commission	2014	Fenton, S. J. Draper, H	Published online	Older people make a huge contribution to society Some communities and faith groups draw on the contribution in responding to the needs of all their members.	This article sheds light on the importance of older people and how ageing can be incorporated into community development. The paper undermines the false notion that elderly do not contribute to their society. On the contrary, they are wealth creators & holders who significantly contribute to the economy and development of their societies. They also have more tendencies to volunteer and participate in community-based institutions.
International journal of medical informatics	2013	Heart, T. Kalderon, E.	Vol. 8(2) p. e209–e231	Older adults: Are they ready to adopt health-related ICT?	The purpose of the study is to discover older adults' adoption of ICT, in order to assess their readiness to use health-related ICT. 60 older adults from Israel participated in face-to-face interviews. Results showed that it is suitable to state that in general elderly are not yet ready to adopt health-related ICT. Many of them have revealed that they do view ICT as a life quality enhancer.
International journal of medical informatics	2013	Heart, T. Kalderon, E.	Vol. 8 (2), p. e209-e231.	Older adults: Are they ready to adopt healt related ICT?	A quantitative study used survey questionnaires in collecting responses from 123 older employees in USA & Israel to examine their willingness to use health-related ICT. Based on the theory of planned behaviour TPB, findings showed that the elderly in both countries are still reluctant in regards to accepting health-related ICT.
The Journal of Community Informatics	2012	Neves, B. B. Amaro, F.	Vol. 8 (1)	Too old for technology? How the elderly of Lisbon use and perceive ICT.	The article contributes toward an understanding of how Lisbon's elderly people (65 and above) use and perceive mobile phones, computers, and the Internet. A random sample of 500 individuals over 64 years of age, were surveyed and ten semi-structured interviews were also conducted. Results showed that the majority of the participants held and used mobile phone; however, most of them did not use computers or the Internet. ICT illiteracy, Education level, lack of necessity and age were all reported to be valid reasons.

Computers in Human Behavior	2011	Ooi, K.-B. Sim, J.-J. Yew, K.-T. Lin, B.	27, p. 1168-1178	Exploring factors influencing consumers' behavioral intention to adopt broadband in Malaysia	Quantitatively studying behavioural intentions to adopt broadband in Malaysia. The study derived constructs from TPB, DOI and MATH. It was found that primary influence, perceived relative advantage and perceived self-efficacy remarkably impact adoption of broadband in the country in which the latter factor was of greatest influence.
Journal of Internet Banking and Commerce	2011	Al-Majali, M. Mat, N.K.N.	Vol. 16(1)	Modeling the antecedents of internet banking service adoption (IBSA) in Jordan: A Structural Equation Modeling (SEM) approach	A study of Internet banking adoption in Jordan that collected 517 responses from university staff. Drawing upon Roger's DOI model, and after applying the structural Equation Modelling analysis technique, all factors of DOI were validated in terms of their impact on the Internet banking services adoption in Jordan.
Journal of Computer Information Systems	2011	Quazi.A Talukder.M	Vol.52 (1), p.34-47	Demographic Determinants of Adoption of Technological Innovation	Drawing upon TAM & TRA, this study used a quantitative approach resulting in 275 responses aiming to unveil the effect of socio-demographic variables on ICT adoption within the context of Australian workplaces. Training & level of education were of most significance in terms of perception and usage of an ICT.
New Media and Society	2011	Van Deursen, A. J. A. M. Van Dijk, J. A. G. M.	Vol. 13(6), p. 893-911	Internet skills and the digital divide	A study conducted in The Netherlands, collected 109 responses using an online random stratified sampling method. Participants were asked to complete certain tasks online to measure their Internet use skills. Results showed that education level is a significant influencer on all aspects of such skills. Age however showed only importance in terms of operational and formal skills. The study indicated that in addition to the physical digital divide, there exists a divide in the Internet use skills.
Computers in Human Behavior	2011	Lee, B. Chen, Y. Hewitt, L	Vol. 27(3), p. 1231-1237	Age differences in constraints encountered by seniors in their use of computers and the internet	A quantitative study that collected survey data from 243 elderly participants between 50-93. It aimed to discover what hinders elderlies from using computers. After factor analysis and ANOVA, it was found that the aspects hindering elderlies from adopting computer-based technologies fell into the categories of intrapersonal, interpersonal, structural and functional.

Institutional Repository UNISA	2010	Van Biljon, J. Van Dyk, T. Gelderblom, H	p. 1-24	Mobile phone adoption: Optimising value for older adults in a developing country	The study adapted the model of Senior Technology Acceptance & Adoption STAM to explore the older adults' (60+) adoption of mobile phones in South Africa. The three phases of STAM were confirmed by analysis. Also around 68% of the respondents chose their mobile phones based on the opinions of the younger generations.
Interacting with Computers	2010	Hanson, V.L	Vol. 22 (6), p. 502–509	Influencing technology adoption by older adults	This study provided a comparative analysis of the performance of two groups when using the web, a group of 7 young participants (30 years and less) & a group of 7 older participants (60+). Both groups were asked to complete same tasks on the Internet. Results showed that both groups completed the assigned tasks. However, the group of elderly required longer time to complete the tasks. This study also emphasizes the importance of cognitive strengths and weaknesses of older adults with regards to their use of technology.
Association for Psychological Science	2009	Charness, N. Boot, W.R	Vol. 18(5), p. 253-258	Aging and Information Technology Use: Potential and Barriers	This paper reviewed the literature pertaining to older adults adoption of ICT to find out reasons behind their reluctance to use such technologies. It concluded that attitudes and abilities are valid predictors of elderlies' use of technology. It then recommends that age-related cognitive & physical abilities should be considered when tech-products are designed. Training programmes is also recommended for the older adults.
Decision Support Systems	2008	Kim, D. Ferrin, D. Rao, R	Vol. 44(2), p. 544-564.	A trust-based consumer decision making model in electronic commerce: The role of trust, perceived risk, and their antecedents	It examines consumers' purchasing decisions from online markets in terms of trust and risk dimensions. Authors had developed a trust conceptual model to test such purchasing intentions. Data was collected online leading to 468 responses, which were then analysed using the method of Structural Equation Modeling. Findings revealed that online purchasing is greatly influenced by consumers' trust and perceived risk. Trust in the website is affected by the reputation of the seller and the disposition to trust of the consumer.
Information Technology & People	2008	Hill, R. Beynon-Davies, P. Williams, M.D.	Vol. 21(3), p. 244-266	Older people and internet engagement: Acknowledging social moderators of internet adoption, access and use	A qualitative paper aims to investigate older adults engagement with the technology of Internet in the UK. Using interviews & observation carried out at workshops for Internet literacy in which a total of 293 people attended. It was found that the likelihood of Internet adoption is dependent on older

					adults' expectations with regards to Internet benefits, meaning the more positive expectations lead to increased likelihood of Intent use.
Electronic Government: An International Journal	2007	Dwivedi, Y. K. Weerakkody, V.	4, p. 43-58	Examining the factors affecting the adoption of broadband in the Kingdom of Saudi Arabia	A quantitative study that used survey questionnaires (138 participants) to examine how attitude is formed in regards to broadband adoption in Saudi Arabia. Perceived usefulness, perceived service quality, age, connection type (e.g. dial-up, satellite) and accommodation type (e.g. home, work) were all major players in that area.
Journal of Computer Information Systems	2006	Choudrie, J. Dwivedi, Y., K.	Vol.46 (4) p. 25-34.	Investigating Factors Influencing Adoption of Broadband in the Household	Examined the adoption issues of broadband Internet technology in the private residences by applying the theory of planned behaviour TPB, the decomposed theory of planned behaviour DTPB and MATH. Data was collected from 172 London household consumers. Empirical analysis found that hedonic outcomes such as perceived entertainment, utility outcomes such as work-related uses and relative advantages such as connection speed are adoption drivers factors. In contrast, the desire to use broadband in households is weakened by some behavioral control factors such as cost and lack of skills with regards to the use of broadband-related technologies.
The Information Society	2006	Brown,S. Venkatesh, V. Bala, H.	Vol. 22, p. 205–218	Household Technology Use: Integrating Household Life Cycle and the Model of Adoption of Technology in Households	By applying the model of adoption of technology in households (MATH) to investigate the adoption and use of personal computers PCs in the context of American households. Analysis found that work-related needs, attitudinal beliefs, fit to personal use, and utility for children greatly influence PC use. Counter wise, normative and control beliefs were insignificant predictors of PC adoption.
The Information Society	2003	Warschauer, M.	Vol.19 (4) p. 297-304	Dissecting the" digital divide": A case study in Egypt.	In this article, Warschauer investigated a case study of technology and education in Egypt. He interviewed more than 100 teachers educational administrators, nongovernmental organization representatives, government officials, and business leaders. He also conducted surveys and online discussions. It was concluded the usage was not effective to promote education. There was no effective strategies by institutions to support and train teachers to use computers in teaching. Teachers know little about educational technology

					and even basic computer operations.

E-government Adoption / Developed & Developing Countries / Middle East					
Publication	**Year**	**Author(s)**	**Vol/No/Pages**	**Article Title**	**Aims/Methods/Findings**
International Journal of Information Management	2018	Verkijika, S.F. De Wet, L.	Vol. 39, p. 20-29	A usability assessment of e government websites in Sub-Saharan Africa	The study conducted a usability evaluation of 279 government e-portals across 6 usability elements. The study covered 31 countries in Sub-Saharan Africa. Findings exhibited poor functionality of most portals. A positive relation was established between such e-portals usability and the E-Government Development Index as well as the E-Participation Index.
Computers in Human Behavior	2017	Kumar, R. Sachan, A. Mukherjee, A.	Vol. 71, p. 299-306	Qualitative approach to determine user experience of e-government services	A qualitative Indian paper intended to study participants' impressions after using e-government services. The study recruited 31 participants aged between 18 & 44 with previous e-government experience. Although it was found that central e-gov portals are much more satisfactory than the local e-portals with more holistic services, there are certain limitations in terms of services quality and features. The poor Internet infrastructure was also another negative contributor to the general impressions of citizens while using e-gov services.
Computers in Human Behavior	2017	Kurfalı, M. Arifoglu, A. Tokdemir, G. Paçin, Y.	Vol. 66, p. 168-178.	Adoption of e-government services in Turkey	A study of Turkey that adopted a combination of UTAUT factors & two trust constructs, namely trust of Internet and trust of government to find out how the decision to use e-government services by citizens is formed. Most applied factors depicted a positive influence on behavioural intention to use-government services (except for effort expectancy and trust of government), such as social influence, facilitating conditions and trust of Internet.
International Business Research	2017	Asmi, F. Zhou, R. Lu, L.	Vol. 10(1), p. 42-58	E-government Adoption in Developing Countries: Need of Customer-centric Approach: A Case of Pakistan	Drawing upon TAM, a quantitative study collected 153 responses in Pakistan integrated the external factors of trust and social influence within the model of TAM in order to examine their indirect influence on e-government adoption by determining their direct influence on perceived ease of use and perceived usefulness. Social influence positively correlated with perceived ease of use and perceived

					usefulness while Trust only correlated with perceived usefulness. The study recommended a more citizen-centric approach in the stages of design and deployment of e-services.
Telematics and Informatics	2017	Abu-Shanab, E.A	Vol. 34, p. 103–113	E-government familiarity influence on Jordanians' perceptions	A longitudinal study that aimed to understand how e-gov familiarity influence citizens within the context of Jordan. A two-phase quantitative method consisting of 241 & 50 responses respectively were obtained. Results showed that with regards to the first sample, awareness of e-gov services attributes and existing digital divide was high. Findings of the second sample showed a substantial effect of familiarity with e-government. Further, perceived usefulness, security & privacy aspects showed high impact on the trust in e-government.
Telematics and Informatics	2017	Lallmahomed,M. Z.I. Lallmahomed , Z. Lallmahome, G.M	Vol. 34, p. 57–72	Factors influencing the adoption of e-Government services in Mauritius	In the context of a developing country, namely Mauritius, this paper draws upon UTAUT 2 & the model of e-gov adoption to understand factors related to citizens'e-gov adoption. A quantitative approach was conducted leading to 247 participations. Results showed a positive association between behavioural intentions and facilitating conditions & perceived value while the association was negative with Computer self-efficacy.
International Business Review	2017	Alzahrani, L. Al-Karaghouli,W. Weerakkody, V	Vol. 26, p. 164–175	Analysing the critical factors influencing trust in e-government adoption from citizens' perspective: A systematic review and a conceptual framework	Through conducting a systemic review of e-government literature (from 200 to 2014) in terms of citizens' trust in order to understand how the trust factors influence adoption of e-gov. Findings revealed that the aspects of TOG & TOI are heavily examined whereas personal attributes of citizens were slightly overlooked. Accordingly, the study proposed an updated conceptual framework of DeLone & McLean IS Success Model that takes into account the antecedents of TOG.
Government Information Quarterly	2016	Porumbescu, G. A.	Vol. 33, p. 291-304	Linking public sector social media and e government website use to trust in government	The research intends to explore how the citizens' trust in the public sector might influence their acceptance & use of online governmental services as well as public sector social media accounts. After analysing the data of 1100 Korean citizens, results indicated that while there was a negative link between greater use of e-government services & citizens' satisfaction and trust of public sector, the relations

					between the use of public sector social media accounts & satisfaction and trust of public sector were positive.
Information & Management	2016	Stefanovic, D. Marjanovic, U Delic´, M. Culibrk, D. Lalic, B	Vol. 53, p. 717–726	Assessing the success of e-government systems: An employee perspective	Attempting to understand the factors of e-gov success factors, this quantitative study gathered data from 154 Serbian employees of e-gov platform. Using SEM analysis methods of the applied factors of DeLone & McLean IS success model, 7 out of 10 hypotheses were supported. For example, information quality, system quality and service quality indicated significance in respects to use intention. However, socio-demographic variables were not influential.
Government Information Quarterly	2015	Bannister, F. Connolly, R.	Vol. 32, p. 1–11	The great theory hunt: Does e-government really have a problem?	A study based on the notion that e-gov literature lacks a rigid theory base and that it has been over dependent on the descriptive case study. The paper concluded that"It has been shown that there is a good deal of imported theory deployed in e- government research and a reasonable body of native theory. Nonetheless, the charge that the field still lacks a proper theoretical frame lingers".
Government Information Quarterly	2015	Meijer, A.	Vol. 32, p. 198–206	E-governance innovation: Barriers and strategies	Based on previous literature, this study proposes a conceptual model of e- governance innovation in terms of stages within first, the process of innovation, second the barriers of government and citizen, and third the barriers in relation to culture and structural aspects. Then this model was validated in the context of a case study in The Netherlands in terms of "a technological system for collaboration between police and citizens". The study established that what motivates both citizens & government officials is the structural elements linking technological opportunities with the creation of public value.
Government Information Quarterly	2015	Rana, N. P. Dwivedi, Y. K.	Vol. 32, p. 172-181	Citizen's adoption of an e-government system: Validating extended social cognitive theory (SCT)	Attempting to study intentions to use an e-gov system in India in terms of various factors such as social influence, anxiety & outcome expectation. Data collected from 8 cities throughout India resulted in 419 responses. Theoretical foundations were based on the extended social cognitive theory SCT, which was validated by analysis in which significant links between six constructs were established.
				Exploring citizen	A Jordanian qualitative research investigated the adoption

Transforming Government: People, Process and Policy	2014	Alomari, M. K. Sandhu, K. Woods, P.	Vol. 8(1), p. 131-150	perceptions of barriers to e- government adoption in a developing country	of e- government by applying focus groups. Findings revealed that many barriers might seem organizational in their nature but influence citizens' adoption such as, resistance to change & waste (favoritism) and word of mouth.
Journal of Software Engineering and Applications	2014	Al-Shboul, M. Rababah, O. Al-Shboul, M. Ghnemat, R. Al-Saqqa, S.	Vol. 07(13), p. 1111–1127	Challenges and Factors Affecting the Implementation of E Government in Jordan	A qualitative study involving semi-structured interviews with 36 Jordanian government officials from diverse departments aiming to explore the state of e-government services adoption in the country. Lack of awareness, lack of trust of e-government services, absence of a holistic policy and regulatory framework and lack of training and knowledge sharing were found to be the major challenges of e-government services adoption in the country.
European Journal of Information Systems	2014	Gregor, S. Imran,A. Turner, T	Vol. 23(6), p. 655-671	A 'sweet spot change strategy for a least developed country: leveraging e-Government in Bangladesh	Motivated by the limited uptake of e-government in the context of Bangladesh, this article develops an action design research project. The paper offers some design principles for what they called " a sweet spot change strategy" with the aim to help lessen the lack of knowledge among major policy makers.
Interacting with Computers	2013	Choudrie, J. Ghinea, G. Songonuga, V. N	Vol. 25(6), p. 417-442	Silver Surfers, E-government and the Digital Divide: An Exploratory Study of London Local Authority Websites and Older Citizens	The aim was to comprehend the e-government initiatives in the UK, London. A mixed-method approach was used. 179 questionnaires responses were received as well as semi structured interviews with 14 respondents and finally a focus group discussion consisting of 5 participants. It was found that helpful and relevant info for older adults do exist on the local authority websites. Further, age, beliefs and level of innovativeness were factors of impact with regards to the perceived Internet benefits.
Manchester Centre for Development Informatics, iGovernment	2012	Lessa, L. Negash, S. Belachew, M	Working Paper 22, p. 1- 14	Steering e-Government Projects from Failure to Success: Using Design-Reality Gap Analysis as a Mid- Implementation Assessment Tool	An Ethiopian qualitative study collected data using structured interviews with four different official teams. The study analysed the reasons for the partial failure of a land management information system. The study concluded that the design- reality gap framework is valuable as "a tool for mid- implementation analysis of e-government projects".
Decision support and future studies	2011	Abdelsalam,H. Reddick, C.	p. 1-21	Success and failure of local e-government projects :	The study examines the development and success factors of e-government projects at the local level in Egypt. 48 employees who were the total users of the system under examination were surveyed. The important element of the

center		ElKadi, H.		lessons learned from Egypt	findings is that it identifies "net benefit" as a success factor in regards to e-government development.
European Journal of Information Systems	2011	Brown, D. H. Thompson, S.	Vol. 20, p. 329-342	Priorities, policies and practice of e government in a developing country context: ICT infrastructure and diffusion in Jamaica	It's a qualitative study that used secondary (document data analysis) and primary sources (semi-structured interviews with officials) to examine the implementation of e-government in practice within the context of a developing country, particularly Jamaica. In terms of the theoretical foundations, the institutional factor analysis approach was adopted to interpret data. 4 substantial themes were recognized that characterised "the context for e-government policy, together with the associated institutional factors".
Issues in Informing Science and Information Technology	2011	Acilar, A.	Vol. 8, p. 231-244	Exploring the aspects of digital divide in a developing country	A study of Turkey that is based on reviewing existing literature with regards to the state and causes of digital divides within the country. Findings showed that age, gender, education level and health status to be major causes of digital divides. The study recommends that to reduce such divides, government should make more investments in ICT in terms of physical and social aspects.
University of Wollongong Thesis Collection	2009	Alhujran, O.	Doctor of Philosophy thesis	Determinants of e-government services adoption in developing countries: a field survey and a case study	This paper explores the determinants of citizen adoption of e-government services in developing countries (Jordan). A multi-site, large-scale questionnaire survey of 335 Jordanian citizens as well as case study interviews with e-government officials were applied. Results suggest that it is very crucial for citizens' attitudes construct to be considered in order to study their adoption of e-government. Perceived public value has also proven to be a critical factor of citizens' belief. Finally, strong evidence that positively relates trustworthiness to citizen belief was reached.
Journal of Applied Research and Technology	2008	Colesca, S. E. Dobrica, L.	Vol.6(3), p. 204-216	ADOPTION AND USE OF E GOVERNMENT SERVICES: THE CASE OF ROMANIA	Using TAM to guide the theoretical aspects, e-government adoption in Romania was explored whereby a quantitative approach leading to 481 responses from citizens. Analysis showed that citizens satisfaction is remarkably influenced by the perceived ease of use, usefulness and service quality, which in turn influence their adoption of e-government.

Journal of Strategic Information Systems	2008	Bélanger, F. Carter, L.	Vol, 17, p. 165-176	Trust and risk in e-government adoption	A quantitative study that collected data from 214 citizens at different locations within USA using paper-based-questionnaires. The aim was to examine users' intentions in light of the web trust model. Results showed that both trusts of Internet & government are influenced by one's disposition to trust which in turn influence intentions to adopt e-government. Trust of government however indicated a negative effect on perceived risk, affecting therefore intentions to use e-government.
International Review of Administrative Sciences	2005	Dugdale, A. Daly, A. Papandrea, F. Maley, M.	Vol. 71(1) p.109–118	Accessing e-government: challenges for citizens and organizations	The study investigates the extent to which some of the Australian initiatives have succeeded with regard to encouraging people to utilize online government services. Through observation and deep analysis of existing literature as well as existing data about socioeconomic variables, it was found that, individuals who are the main beneficiaries of services provided by government are the least able to deal with advanced ICT, including Internet. It also revealed that government needs to pay more attention to the development of community-based human capital.
Information Systems Journal	2005	Carter, L. Bélanger, F	Vol. 15, p. 5–25	The utilization of e-government services: citizen trust, innovation and acceptance factors	The study investigates factors by which intentions of citizens towards using e-government systems are influenced based on TAM, DOI and Trust model. The study applied a quantitative approach by which survey questionnaires were collected form 105 citizens in USA. Analysis suggested that citizens' intention to use e-gov systems can be determined by complexity level, compatibility and trustworthiness.

E-government Adoption / GCC & Saudi Arabia					
Publication	**Year**	**Author(s)**	**Vol/No/Pages**	**Article Title**	**Aims/Methods/Findings**

The Journal of developing areas	2018	Mirchandani, D.A	Vol. 52(1), p. 269-279	Preferences of Kuwait's Residents for E-Government Services and Portal Factors	A study of Kuwait that collected data quantitatively using survey questionnaires. Data was collected from 284 students to explore their preferences in respect to e-gov services and portal quality aspects. Results posited that to increase e-participation with government, the quality of portals should be enhanced. Personalization and efficiency issues have also come up.
The Electronic Journal of e-Government	2017	Alenezi, H. Tarhini, A. Masa'deh, R. Alalwan, A. Al-Qirim, N.	Vol. 15(2), p. 84–102	Factors Affecting the Adoption of e Government in Kuwait: A Qualitative Study	The study applied a qualitative approach involving semi-structured one-on-one interviews with 31 employees who belong to three e-government organisations aiming to examine what hampers strategic benefits of e-government initiatives in Kuwait. Outcomes identified many aspects of information quality that may hinder citizens from "complications-free" use of e-services, such as the ease of use, security, interpretability and completeness of services.
International Journal of Information Technology	2017	Basahel, A. Yamin, M.	Vol. 9(3), p. 287–293	Measuring success of e-government of Saudi Arabia	A mixed-method study that examined e-government status in Saudi Arabia in terms of the level of success & satisfaction based on the rule of thumb that the success can be determined by users' satisfaction in which the latter is achieved by promoting awareness, trust and training provision.
DIGITAL POLICY, REGULATION AND GOVERNANCE	2017	Saxena, S.	Vol. 19 (3), p. 251-263	Significance of open government data in the GCC countries	This article looks into the current state of open government data OGD within the GCC countries. Using a qualitative approach, findings showed that OGD implementation is in its infancy with various unaddressed hindrances. These include friendliness of interfaces and information security and confidentiality.
EuroMed Journal of Business	2016	AL Athmay, AA. Fantazy, K. Kumar, V.	Vol. 11(1), P. 57-83	E-government adoption and user's satisfaction: an empirical investigation	A quantitative study conducted in the context of The United Arab Emirates (UAE) to examine e-government adoption using Delone & Mclean's updated IS success model as well as the UTAUT model. The study found that social influence, system quality, information quality, and perceived effectiveness influence user satisfaction, which in turn affects the intentions to adopt e-government.

Brunel University	2015	Anan, A	Doctor of Philosophy thesis	Mobile challenges and opportunities for e-government in saudi arabia	This thesis looks into the difficulties and prospects of mobile government in Saudi Arabia. Using a mixed-method approach, it was found that m-government is facing many challenges including, low quality of ICT infrastructure especially the Internet, security & privacy of users' data, customization issues and government bureaucracy.
People, Process and Policy	2015	Sharma, S. K.	Vol. 9(2), p. 207-222	Adoption of e government services: The role of service quality dimensions and demographic variables	A study of Oman that developed a model by which the issue of e-service quality is addressed. It was found that the quality dimensions of e-services, such as efficiency, reliability, responsiveness and security, significantly influence the adoption of e-government services. Age & education have also been identified to affect the willingness to use e-government services.
Brunel University, London	2015	Albesher, A.	Doctor of Philosophy thesis	PhD Thesis: Trust as a Source of Long-Term Adoption of E-government	A mixed-method Saudi Arabian research that was based on two main theoretical models; TRA and trustworthiness to find out existing barriers towards successful e-government adoption. In total, 570 questionnaires and 25 interviews were obtained. Findings showed that citizens' trust in e-government is considerably influenced by government integrity, benevolence and capability. Trust in Internet and disposition to trust were also factors of impact on citizens' trust in e-government.
International Conference on Information Society	2014	Ali, H. Ali, T	p. 146-150	E-participation: Factors affect Citizens' acceptance and readiness in Kingdom of Bahrain	The article studies E-participation in Bahrain and the role of government in using ICT to promote citizens' E-participation. The study applied a quantitative approach using online surveys. Drawing upon Technology Readiness Acceptance Model (TRAM), analysis indicated that among other factors, the level of optimizations, eases of use and usefulness are positively associated with citizens' readiness to engage in e-participation systems.

International Journal of Humanities and Social Science	2014	Basamh, S.S. Qudaih, H.A. Suhaimi, M.A.	Vol. 4(2), p. 296-300	E-Government Implementation in the Kingdom of Saudi Arabia: An Exploratory Study on Current Practices, Obstacles & Challenges	Through extensive literature review, this paper identified challenges and obstacles of the e-gov implementation & adoption in Saudi Arabia. It revealed that the existing digital & economic divides within the Saudi society greatly influence implementation and use of e-government. Other factors were identified include, accessibility, trustworthiness, technology literacy, use & implementation costs are all negative contributors to the e-gov readiness and adoption in the country.
Proceedings of the 7th International Conference on Theory and Practice of Electronic Governance	2013	Al-Faries, A. Al-Khalifa, H.S. Al-Razgan, M. S. Al-Duwais, M.	p. 60-63	Evaluating the Accessibility and Usability of Top Saudi E- Government Services	This paper examined the usability and accessibility of the most used e-government public services in Saudi Arabia. The usability test was based on expert reviews whereas accessibility test was conducted based on WCAG 2.0 recommendations. Findings indicated the existence of one or more accessibility violations while usability test showed that most evaluated services were usable and well designed.
Information & Management	2013	El-Haddadeh, R. Weerakkody, V. Al-Shafi, S	Vol. 50, p. 135–143	The complexities of electronic services implementation and institutionalisation in the public sector	A longitudinal study that historically tracked the development of electronic service implementation in the public sector in Qatar. By the application of the institutional theory as a lens, e-services were found to improve the collaboration between public departments, acknowledge partnerships as the way to accomplish robust e-service delivery, enhance local capabilities to acquire stable e-service delivery and boost policy makers ability to react to external pressures.
International Journal of Information and Education Technology,	2013	O. Alfarraj, T. Alhussain, A. Abugabah	Vol. 3(3), p. 319 - 324	Identifying the Factors Influencing the Development of eGovernment in Saudi Arabia: The Employment of Grounded Theory Techniques	From the perspectives of the developers, this study attempts to understand the implementation of e-gov in Saudi Arabia. Using a qualitative approach that is based on the Grounded theory, 21 interviews were conducted with IT and strategic staff. Findings unveil various factors contributing to the delay of e-gov implementation, including Cooperation & Collaboration aspect, Organisational aspect, Staff and Managers aspect, technical aspect & Enablers aspects.

International Journal of Advanced Computer Science and Applications	2013	Alateyah, S. Crowder, R. Wills, G	Vol. 4(11), p. 57-66	An Exploratory study of proposed factors to Adopt e-government Services: Saudi Arabia as a case study	A mixed-method study of Saudi Arabian citizens' intentions to use e-government services. Drawing upon various factors from TAM, DOI and quality of services model, the study highlighted many factors of impact including, e-service availability, compatibility and complexity. Age, education level and security were also highlighted as significant factors in regards to the adoption of e-government services in Saudi Arabia.
International Journal of Information Management	2013	Weerakkody, V. El-Haddadeh, R. Al-Sobhi, F. Shareef, M.A. Dwived, Y.K	Vol. 33, p. 716–725	Examining the influence of intermediaries in facilitating e-government adoption: An empirical investigation	Drawing upon an extended UTAUT model, this study applied a quantitative approach in order to study how citizens' adoption of e-gov is effected by the role of intermediaries in Saudi Arabia. Using survey questionnaires lead to 502 responses. It was found that trust of intermediary as well as performance & effort expectancy are valid predictors of e-gov adoption.
International Journal of Computer Applications	2012	Al-Tourki, T. El-Sofany, H. F. Al-Sadoon, A. Al-Howimel, H.	Vol. 48(5), p. 975–888	E-government in Saudi Arabia: Barriers, Challenges and its Role of Development	A quantitative e-government study that collected data from citizens of different ages using online surveys. Analysis indicated that privacy and security have come up as undermining factors of e-government adoption. It also seems that the lack of trained and qualified personnel as well as the humbleness of some aspects within the ICT infrastructure are two major impediments of e-government adoption in Saudi Arabia.
The Electronic Journal of Information Systems in Developing Countries (EJISDC)	2012	Alanezi, M.A. Mahmood, A.K. Basir, S.	Vol. 54(3) p.1-20	E-government service quality:A qualitative evaluation in the case of Saudi Arabia	The research attempts to investigate aspects that contribute to e-government service quality in Saudi Arabia, in which four service quality categories were explored; system function, content, procedural, and finally citizen support. Semi-structured interviews were carried out with 11 participants from different professions all were male aged between 23 and 38 years. The study found that citizens would be considering e-Government services as quality services only when these services meet their needs. In this context, low online services quality generates a negative impression on the citizen or user of these services.

European Journal of ePractice	2012	Al-Khouri, A.M	Vol. 17, p. 126-150	eGovernment Strategies The Case of the United Arab Emirates (UAE)	This paper discusses the tremendous advantages of advanced e-government systems in The United Arab Emirates. The author argues that the key element into achieving successful e-government projects is to establish public trust which in turn endorsees diffusion and participation among stakeholders.
The International Journal of Advanced Computer Science and Applications	2010	Alshehri, M. Drew, S.	Vol. 3(2), p.1-6	A Comprehensive Analysis of E-government services adoption in Saudi Arabia: Obstacles and Challenges	A quantitative e-government adoption study in Saudi Arabia that surveyed 460 citizens from various profession backgrounds. Results indicated that apart from factors related directly to the users themselves, such as computer illiteracy, most of the barriers towards successful adoption of e-government fell into the category of "systemic barriers" (e.g. unreliable Internet connection, limited IT infrastructure).
Journal of E Government Studies and Best Practices	2010	Westland, D. Al-Khouri, A. M.	Vol. 2010 P. 1-9	Supporting e-government progress in the United Arab Emirates	This article is designed to outline how e-government development is being supported by the national identity management infrastructure program in the United Arab Emirates (UAE). The government of UAE has focused on a mixed-approach of centric governance and citizen centric approach for its e-government initiatives. This has completely transformed many of the traditional government related models instead of just computerizing those governmental services.
Government Information Quarterly	2009	Hamner, M. Al-qahtani, F.	Vol. 26(1), p. 137-143	Enhancing the case for Electronic Government in developing nations : A people-centric study focused in Saudi Arabia	A quantitative study that collected 453 responses in Riyadh to understand acceptability of e-government services by individual citizens. Using the correlation analysis method revealed that the Saudi people in Riyadh are generally willing to adopt e-gov if it's available. Further, age, security and Internet skills strongly related to the willingness to use e-gov while education level was not of statistical significant.
Victoria University	2006	AlShihi, H	Doctor of Philosophy thesis	Critical Factors in the Adoption and Diffusion of E-government Initiatives in Oman	The research studies existing barriers facing adoption and diffusion of e-government services focusing on country specific and non-technical factors in Oman. Data collection was based on face-to-face administered questionnaires of 140 Omani citizens belong to different age groups and backgrounds in addition to semi-structured interviews with 13 high-ranking

					government officials. Research findings showed that non-technical hurdles performed key role in using ICTs in e-Government services in Oman. These non-technical factors include lack of marketing campaign, less knowledgeable users of ICTs, and short-term planning by government. This has negatively impacted the citizens' decision to adopt technology for e-Government initiatives and did not allow the government to realize the long-term potential of e-government.

Appendix 2-2 Table of Construct & Items

Construct	Definition	Items
Social influence	"The degree to which an individual believes that people who are important to her/him think she/he should perform the behaviour in the question". (Fishbein & Ajzen 1975) "Social influence concerns the psychological needs, which lead individuals to conform to the expectations of the reference groups". (Deutsch & Gerard, 1955) "A reference group concerns family members, friends, and coworkers who are important to an individual". (Venkatesh & Morris, 2000)	**1.** People who are important to me think that I should use MOI e-Portal. **2.** People who influence my behavior think that I should use MOI e-Portal. **3.** People whose opinions I value think that I should use MOI e-Portal. (Venkatesh & Morris, 2000a)
Perceived cyber risk	"Perceived cyber risk measures one's discomfort about using an online system considering the likely exposure to cybercrimes". (Wang et al, 2009)	**1.** Using a MOI e-Portal service may expose me to online frauds. **2.** Using a MOI e-Portal service may expose me to identity theft. **3.** Use of a MOI e-Portal service may expose me to cyber criminals. **4.** Using a MOI e-Portal service may expose me to malicious attacks. (Grazioli & Jarvenpaa, 2000)
		1. I could get the information that I am interested on this website. (MOI e-Portal) **2.** This website (MOI e-Portal) is easy-to-navigate.

Perceived Website assistance	"The perception that an e-Government site facilitates user's activities. When a user perceives that an e-Government site helps him or her with the management of personal activities, he or she tends to develop a positive attitude toward the site". (Chen & Sharma, 2015) (With amendment in wording to suit the context of e-Government)	**3.** The way this website (MOI e-Portal) displays its services is efficient. **4**. This website has good text size **5**. This website has good colours that I can see **6**. There is a good frequently answered section that I can consult for any confusing information **7**. The page or portal download very easily, which saves me time & effort (Wu, 2009)
Compatibility	Compatibility refers to '"the degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of adopters". Rogers (1995)	**1**. I think using MOI e-Portal services fits well with the way that I like to gather information from the government. **2**. I think using MOI e-Portal services fits well with the way that I like to interact with the government. **3**. Using MOI e-Portal services to interact with the government fits into my lifestyle (e.g. culture, interests, values). **4**. Using MOI e-Portal services to interact with the government is incompatible with how I like to do things. (Carter and Bélanger, 2005)
Relative Advantage	"The degree to which an innovation is seen as being superior to its predecessor". Rogers (1995)	**1.** Using MOI e-Portal services enhances my efficiency in gathering information from the government. **2**. Using MOI e-Portal services enhances my efficiency in interacting with the government. **3**. Using MOI e-Portal services doesn't make it easier to gather information from the government.

		4. Using MOI e-Portal services makes it easier to interact with the government. **5**. Using MOI e-Portal services gives me greater control over my interaction with the government. (Carter and Bélanger, 2005)
Image	Image refers to "one's perceptions of an innovation as a status symbol". Moore & Benbasat (1991)	**1.** People who use the web to gather information from the government have a high profile (e.g. an outstanding and/or a recognized person in society) **2.** People who use MOI e-Portal services have a high profile. **3.** People who use the web to gather information from the government have more prestige than those who do not (high status or reputation). **4.** People who use MOI e-Portal services have less prestige than those who do not (less status or reputation). **5.** Interacting with the government over the web enhances a person's social status. (Carter and Bélanger, 2005)
Complexity	"The degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand". Rogers (1995)	6. Learning to interact with MOI e-Portal is easy for me. 7. I believe interacting with MOI e-Portal is a clear and understandable process. 8. I find MOI e-Portal to be flexible to interact with. 9. It is easy for me to become skillful at using MOI e-Portal. 10. I find MOI e-Portal difficult to use.

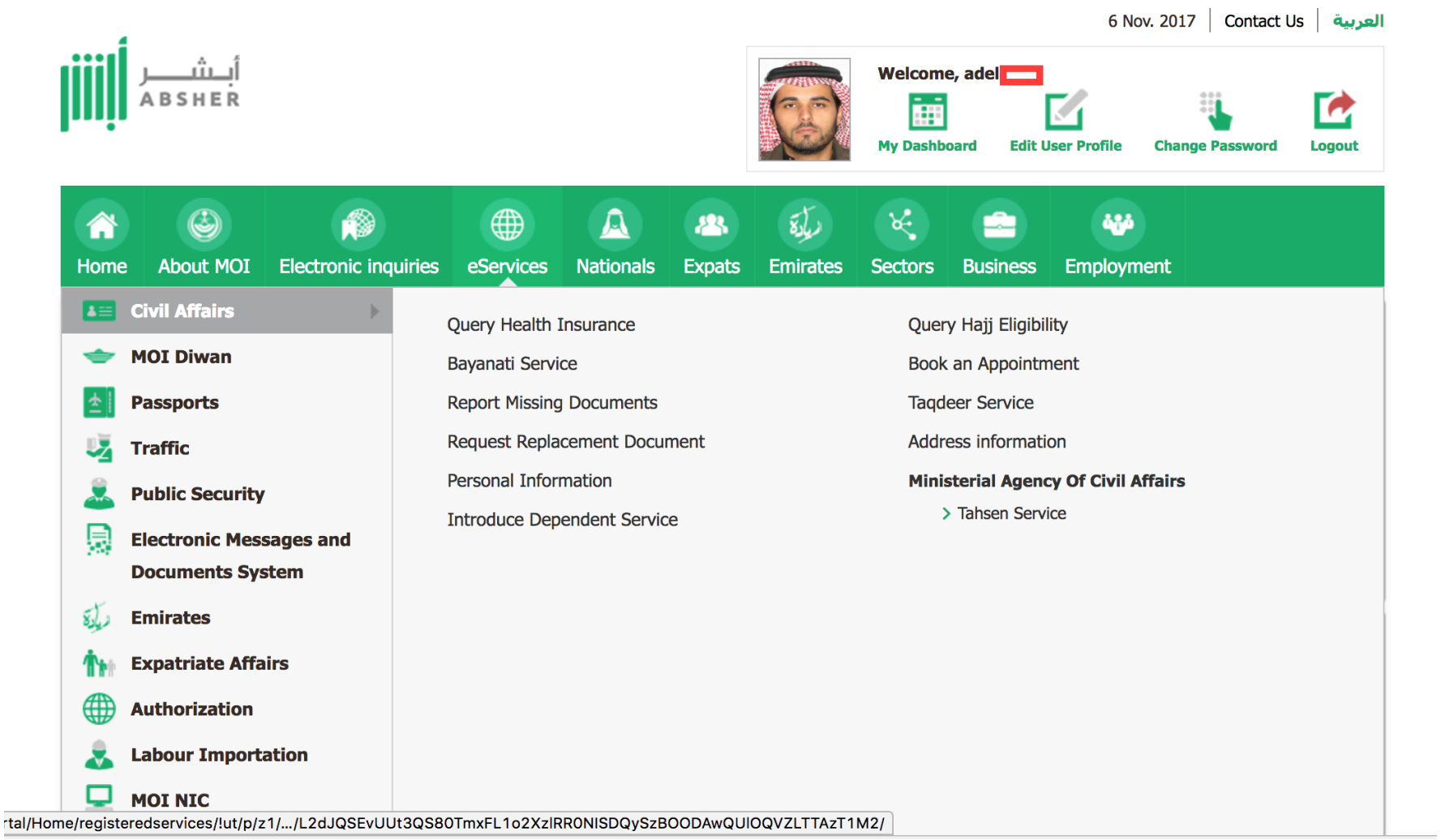
		(Carter and Bélanger, 2005)
Use intentions	Intention is "a person's location on a subjective probability dimension involving a relation between him/herself and some action. Use intention, therefore, refers to a person's subjective probability that he/she will perform some behaviour". (Fishbein& Ajzen, 1975)	**1.** I would use MOI e-Portal for gathering government information. **2.** I would use MOI e-Portal services provided over the Web. **3.** Interacting with MOI e-Portal over the Web is something that I would do. **4.** I would not hesitate to provide information to MOI e-Portal. **(**Bélanger, Carter, 2008)
Trust of the Internet (TOI)	Trust of the Internet (TOI) is consistently identified as a key predictor of e-service adoption. (Carter and Be´langer, 2005; McKnight et al., 2002; Pavlou, 2003; Warkentin et al., 2002; Welch et al., 2005) This type of trust is frequently labeled institution-based trust. Institution-based trust refers to an individual's perceptions of the institutional environment, including the structures and regulations that make an environment feel safe. (McKnight et al., 2002)	**1)** The Internet has enough safeguards (e.g. firewalls & security certificate) to make me feel comfortable using it to transact personal business with MOI e-Portal. **2)** I feel assured that legal and technological structures adequately protect me from problems on the Internet (e.g. related protection regulations, terms and conditions agreement). **3)** In general, the Internet is now a robust and safe environment in which to transact with MOI e-Portal (e.g. Padlock icons symbolising a secure web transaction). **(**Bélanger, Carter, 2008)
Trust of the government	TOG refers to "one's perceptions regarding the integrity and ability of the agency providing the service". (Becerra and Gupta, 1999; Ganesan and Hess, 1997; Jarvenpaa et al., 1998; Lee and Tur- ban, 2001; Mayer et al., 1995; McKnight et	**1.** I think I can trust government agencies (believe in the integrity and ability of the agency providing the service). **2.** Government agencies can be trusted to carry out online transactions faithfully.

(TOG)	al., 2002, 1998)	**3.** I trust government agencies keep my best interests in mind. **4.** In my opinion, government agencies are trustworthy. **(**Bélanger, Carter, 2008)
Disposition to trust	Disposition to trust is "sometimes referred to as personality-based trust because it refers to one's general tendency to believe or not to believe in others". (Gefen et al., 2003; Mayer et al., 1995)	**1.** I generally do not trust other people. **2.** I generally have faith in humanity. **3.** I feel that people are generally reliable. **4.** Generally trust other people unless they give me reason not to. **(**Bélanger, Carter, 2008)

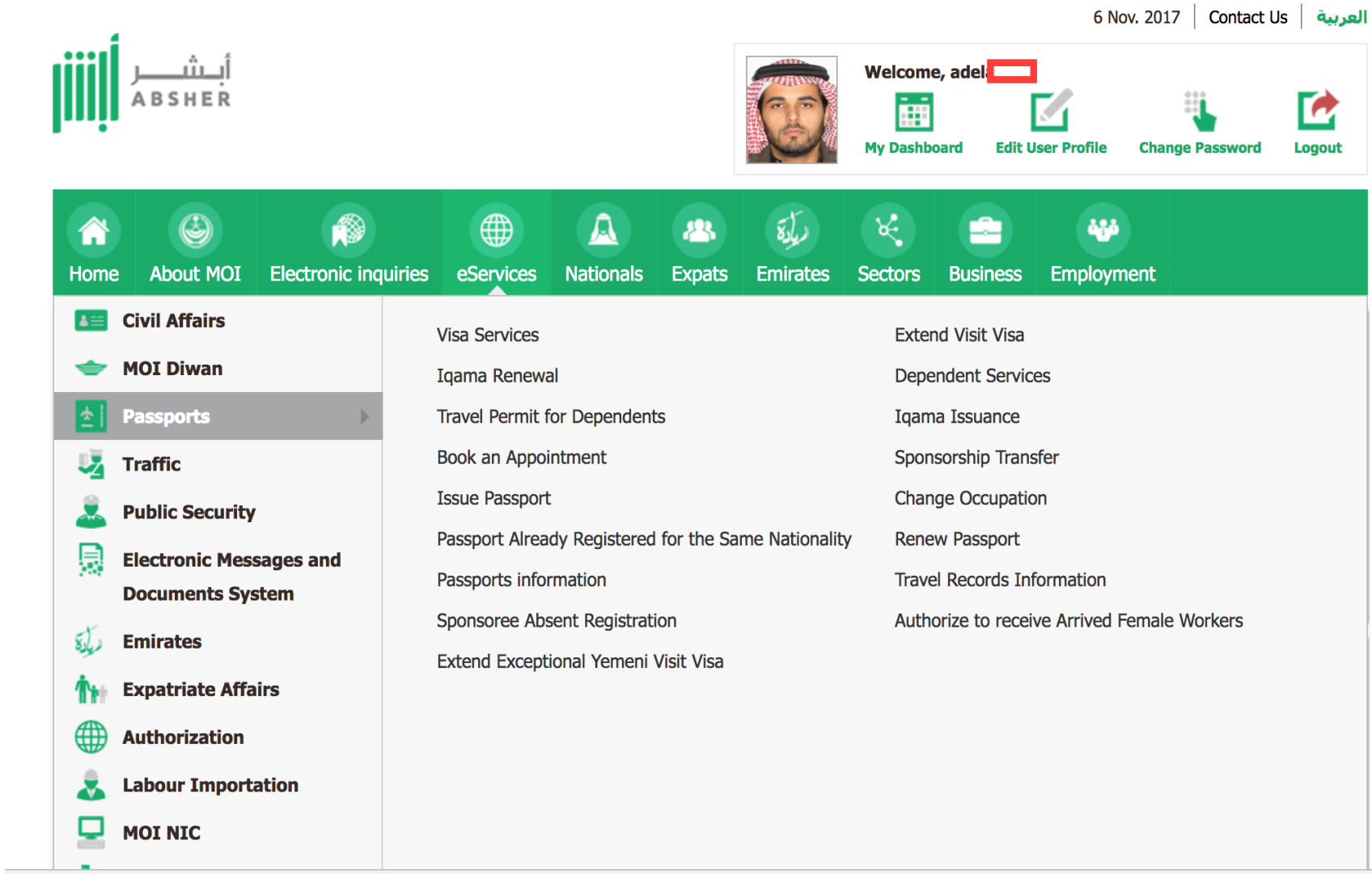
Appendix 3-1 Panoramic pictures of Hail City


شبكة ومنتديات حائل نت

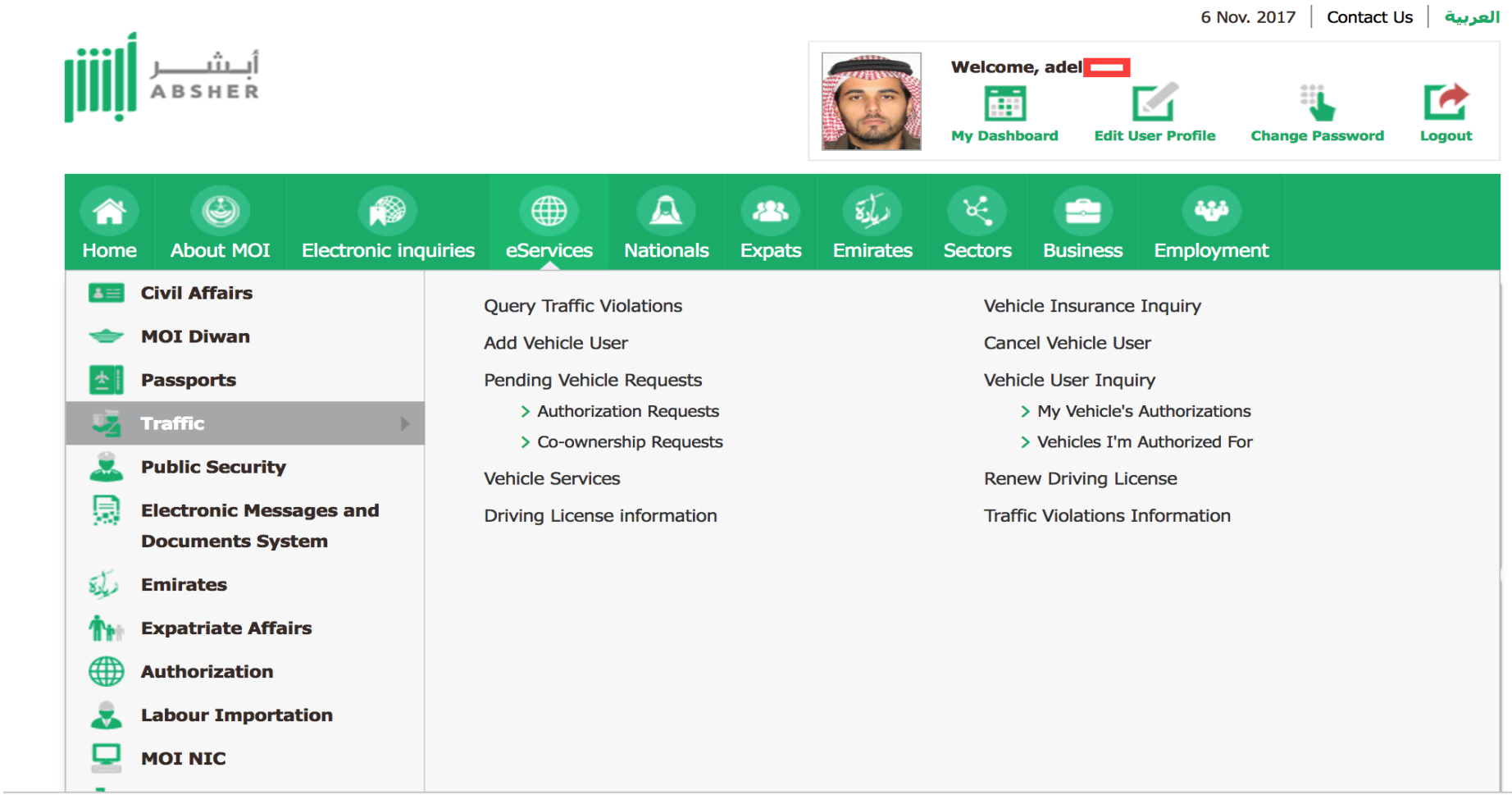
Appendix 3-2 Some MOI E-portal Services



Civil Affairs Services



Passport Services



Traffic Services

Appendix 3-3 Calculation Table of the Content Validity Ratio (CVR)

Question No	Essential	Useful, but not essential	Not necessary	CVR	Accept/Reject
1	10	0	0	1	**Accepted**
2	8	2	0	0.6	**Accepted**
3	10	0	0	1	**Accepted**
4	8	1	1	0.6	**Accepted**
5	8	1	1	0.6	**Accepted**
6	9	1	0	0.8	**Accepted**
7	9	1	0	0.8	**Accepted**
8	10	0	0	1	**Accepted**
9	10	0	0	1	**Accepted**
10	10	0	0	1	**Accepted**
11	10	0	0	1	**Accepted**
12	9	1	0	0.8	**Accepted**
13	10	0	0	1	**Accepted**
14	9	0	1	0.8	**Accepted**
15	9	1	0	0.8	**Accepted**
16	9	1	0	0.8	**Accepted**
17	6	2	2	0.2	**Rejected**
18	6	1	3	0.2	**Rejected**
19	8	2	0	0.6	**Accepted**
20	6	3	1	0.2	**Rejected**
21	9	1	0	0.8	**Accepted**
22	8	2	0	0.6	**Accepted**
23	10	0	0	1	**Accepted**
24	9	1	0	0.8	**Accepted**
25	10	0	0	1	**Accepted**
26	9	1	0	0.8	**Accepted**
27	10	0	0	1	**Accepted**
28	10	0	0	1	**Accepted**
29	10	0	0	1	**Accepted**
30	10	0	0	1	**Accepted**
31	10	0	0	1	**Accepted**
32	10	0	0	1	**Accepted**
33	10	0	0	1	**Accepted**
34	10	0	0	1	**Accepted**
35	10	0	0	1	**Accepted**
36	10	0	0	1	**Accepted**
37	10	0	0	1	**Accepted**
38	8	2	0	0.6	**Accepted**
39	10	0	0	1	**Accepted**
40	10	0	0	1	**Accepted**
41	10	0	0	1	**Accepted**

Appendix 3.4 Calculation Table of the Average Completion Time for the Questionnaire

Total Completion Time of Each Expert	
Dr.J: 21 mins	Mrs.A: 20 mins
Dr.A: 19 mins	Mr.M: 21 mins
Dr.S: 22 mins	Mr.A: 21 mins
Dr.B: 22 mins	Mr.F: 26 mins
Dr.B: 24 mins	Mr.A: 20 mins
Average Completion Time: 21.6 mins	

Appendix 3-5 Content Validity-Instructions

Dear Participant,

I am conducting some research for a doctoral study at University of Hertfordshire and would be most grateful if you could please assist me with the content validity part of this research. For this part, I would be most grateful if you could please provide an opinion in terms of whether a question is:

Essential to aims of this research.
Useful, but not essential to the aims of this research.
Not necessary to the aims of this research

To view the questionnaire, a link to the survey questionnaire is provided that is:
https://www.surveymonkey.com/r/7P6JVKK

When determining the questions phrasing or any other problem, Please select one box for EACH question according to the statement that you think is applicable from the three options given above. After checking for accuracy and correctness, please complete the questionnaire.

As you are about to begin, please make a note of the time that you have spent on the questionnaire. Once you have done this, please save the document, and email it to me at **aas131@hotmail.com**

Thank you in advance for all your assistance.

Adel Alfalah

Email: aas131@hotmail.com
Mobile: +447908223353 - +966532094651

Please enter your name here >

SURVEY QUESTIONS

Section 1: Background Information

	Essential	Useful, but not essential	Not necessary
Question 1	☐	☐	☐
Question 2	☐	☐	☐
Question 3	☐	☐	☐
Question 4	☐	☐	☐
Question 5	☐	☐	☐
Question 6	☐	☐	☐
Question 7	☐	☐	☐

Section 2: Internet Connectivity

	Essential	Useful, but not essential	Not necessary
Question 8	☐	☐	☐

Section 3: Internet Access

	Essential	Useful, but not essential	Not necessary
Question 9	☐☐☐☐ ☐☐☐ ☐	☐	☐

Section 4: Internet Usage

	Essential	Useful, but not essential	Not necessary
Question 10	☐	☐	☐
Question 11	☐	☐	☐
Question 12	☐	☐	☐
Question 13	☐	☐	☐
Question 14	☐	☐	☐

Section 5: Do you have a tablet device?

	Essential	Useful, but not essential	Not necessary
Question 15	☐	☐	☐

Question 16	☐	☐	☐
Question 17	☐	☐	☐
Question 18	☐	☐	☐
Question 19	☐	☐	☐
Question 20	☐	☐	☐
Question 21	☐	☐	☐

Section 6: I do plan to get a tablet device.

	Essential	Useful, but not essential	Not necessary
Question 22	☐	☐	☐
Question 23	☐	☐	☐
Question 24	☐	☐	☐

Section 7: I do not plan to get a tablet device.

	Essential	Useful, but not essential	Not necessary
Question 25	☐	☐	☐
Question 26	☐	☐	☐

Section 8: Primary Influence: Influence of the people who are important to you.

	Essential	Useful, but not essential	Not necessary
Question 27	☐	☐	☐

Section 9: Perceived Cyber-risk: What are the risks of using online systems.

	Essential	Useful, but not essential	Not necessary
Question 28	☐	☐	☐
Question 29	☐	☐	☐

Section 10: Compatibility: Compatibility of MOI e-Portal with your values, beliefs, experiences and needs.

	Essential	Useful, but not essential	Not necessary
Question 30	☐	☐	☐

Section 11: Relative Advantage: MOI e-Portal Vs. Traditional ways of interaction with the government.

	Essential	Useful, but not essential	Not necessary
Question 31	☐	☐	☐

Section 12: Image: The link between an MOI user and his/her image (status symbol).

	Essential	Useful, but not essential	Not necessary
Question 32	☐	☐	☐

Section 13: Complexity: Complexity of MOI e-Portal.

	Essential	Useful, but not essential	Not necessary
Question 33	☐	☐	☐

Section 14: Use Intentions: Intentions to use MOI e-Portal.

	Essential	Useful, but not essential	Not necessary
Question 34	☐	☐	☐

Section 15: Reasons for not accessing the Internet.

	Essential	Useful, but not essential	Not necessary
Question 35	☐	☐	☐

Section 16: Reasons for not planning to have an Internet connection at home

	Essential	Useful, but not essential	Not necessary
Question 36	☐	☐	☐

Section 17: Plans to have an Internet connection.

	Essential	Useful, but not essential	Not necessary
Question 37	☐	☐	☐

Question 38	☐	☐	☐

Section 18: Trust: Trust of the Internet

	Essential	Useful, but not essential	Not necessary
Question 39	☐	☐	☐

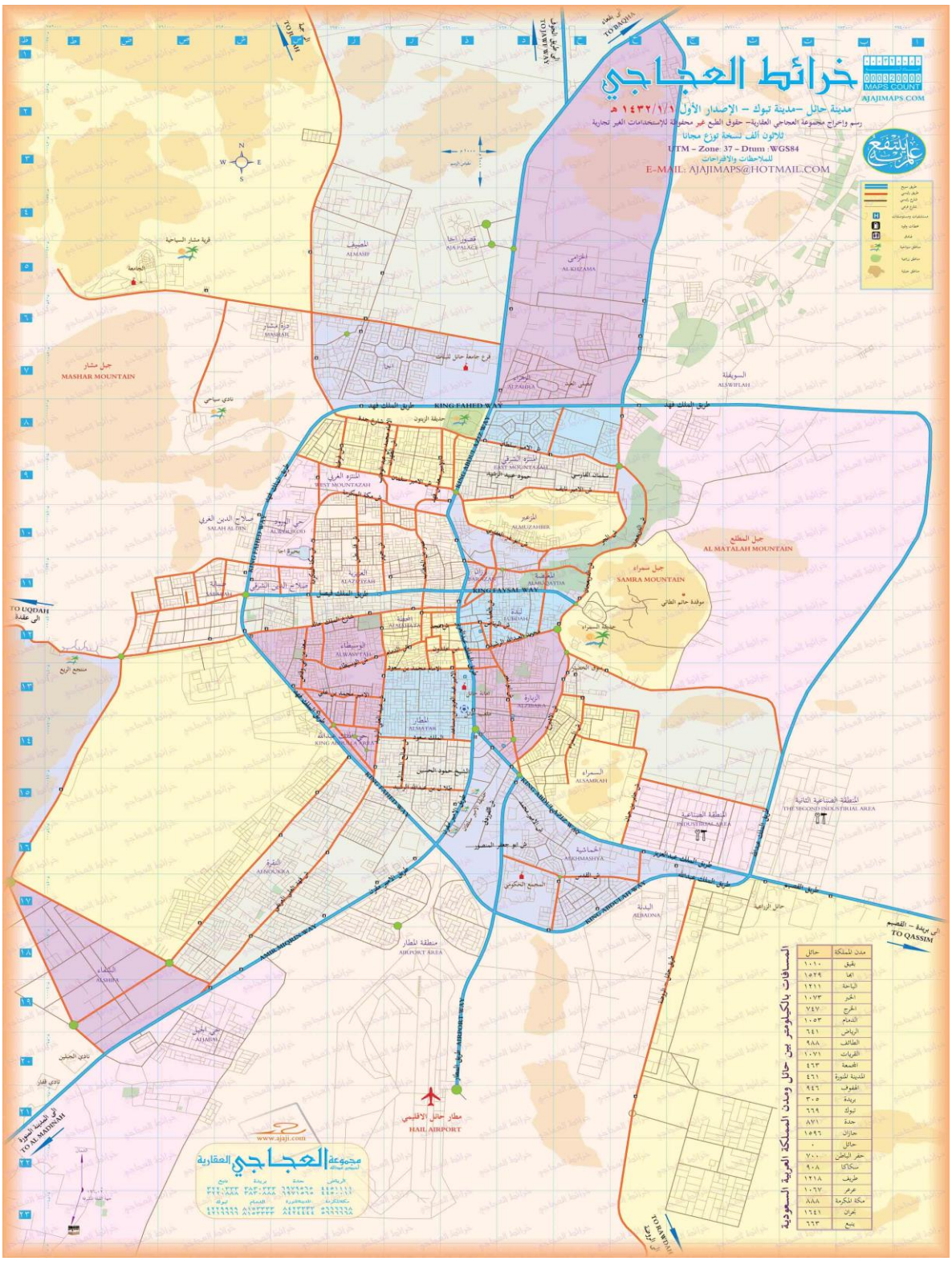
Section 19: Trust of the government

	Essential	Useful, but not essential	Not necessary
Question 40	☐	☐	☐

Section 20: Disposition to Trust: Tendency to believe or not to believe in others

	Essential	Useful, but not essential	Not necessary
Question 41	☐	☐	☐

Appendix 3-6 Map of Hail City's Neighbourhoods



Appendix 3-7 Ethical Approval

UNIVERSITY OF HERTFORDSHIRE SOCIAL SCIENCES, ARTS AND HUMANITIES

ETHICS APPROVAL NOTIFICATION

TO	Adel Abdulmhsen A Alfalah
CC	Prof Jyoti Choudrie
FROM	Dr Tim Parke, Social Sciences,Arts and Humanities ECDA Chairman
DATE	07/05/2015

Protocol number: cBUS/PG/UH/00854

Title of study: Older Adults and e-Services in Hail City: A digital Divide Study of Adoption and Use.

Your application for ethical approval has been accepted and approved with the following conditions by the ECDA for your school.

Approval Conditions:

- Attached confidentiality agreement to be signed and dated by Reem Alshehri and returned to ssahecda@herts.ac.uk prior to recruitment or data collection.
- Supervisor to see and approve the questionnaire and interview schedule prior to recruitment and data collection.

This approval is valid:

From: 07/05/2015

To: 01/12/16

Please note:

Your application has been conditionally approved. You must ensure that you comply with the conditions noted above as you undertake your research. Failure to comply with the conditions will be considered a breach of protocol and may result in disciplinary action which could include academic penalties. Additional documentation requested as a condition of this approval protocol may be submitted via your supervisor to the Ethics Clerks as it becomes available. All documentation relating to this study, including the information/documents noted in the conditions above, must be available for your supervisor at the time of submitting your work so that they are able to confirm that you have complied with this protocol.

Approval applies specifically to the research study/methodology and timings as detailed in your Form EC1. Should you amend any aspect of your research, or wish to apply for an extension to your study, you will need your supervisor's approval and must complete and submit form EC2. In cases where the amendments to the original study are deemed to be substantial, a new Form EC1 may need to be completed prior to the study being undertaken.

Should adverse circumstances arise during this study such as physical reaction/harm, mental/emotional harm, intrusion of privacy or breach of confidentiality this must be reported to the approving Committee immediately. Failure to report adverse circumstance/s would be considered misconduct.

Ensure you quote the UH protocol number and the name of the approving Committee on all paperwork, including recruitment advertisements/online requests, for this study.

Students must include this Approval Notification with their submission.

Appendix 4-1 CONSENT FORM

UNIVERSITY OF HERTFORDSHIRE
ETHICS COMMITTEE FOR STUDIES INVOLVING THE USE OF HUMAN PARTICIPANTS ('ETHICS COMMITTEE')

FORM EC3

CONSENT FORM FOR STUDIES INVOLVING HUMAN PARTICIPANTS

I, the undersigned *[please give your name here*, *in BLOCK CAPITALS] No Names are required for this study, Initials are enogh.*

……..…

of *[please give contact details here, sufficient to enable the investigator to get in touch with you, such as a postal or email address]*

…..……

hereby freely agree to take part in the study entitled *[insert name of stu*dy *here]*

……..

1 I confirm that I have been given a Participant Information Sheet (a copy of which is attached to this form) giving particulars of the study, including its aim(s), methods and design, the names and contact details of key people and, as appropriate, the risks and potential benefits, and any plans for follow-up studies that might involve further approaches to participants. I have been given details of my involvement in the study. I have been told that in the event of any significant change to the aim(s) or design of the study I will be informed, and asked to renew my consent to participate in it.

2 I have been assured that I may withdraw from the study at any time without disadvantage or having to give a reason.

3 In giving my consent to participate in this study, I understand that voice, video or photo-recording will take place.

4 I have been given information about the risks of my suffering harm or adverse effects. I have been told about the aftercare and support that will be offered to me in the event of this happening, and I have been assured that all such aftercare or support would be provided at no cost to myself.

5 I have been told how information relating to me (data obtained in the course of the study, and data provided by me about myself) will be handled: how it will be kept secure, who will have access to it, and how it will or may be used.

6 I understand that if there is any revelation of unlawful activity or any indication of non-medical circumstances that would or has put others at risk, the University may refer the matter to the appropriate authorities.

7 I have been told that I may at some time in the future be contacted again in connection with this or another study.

Signature of participant……..…Date……..

Signature of (principal) investigator……Date……

Name of (principal) investigator *[in BLOCK CAPITALS please]*

……

Consent Form In Arabic

جامعة هرتفوردشير
لجنة الأخلاقيات الخاصة بالدراسات المتضمنة مشاركة بشرية
(لجنة الأخلاقيات)

نموذج التفويض الخاص بالدراسات المتضمنة مشاركة بشرية

أنا الموقع أدناه، .....

بإمكانكم التواصل معي عن طريق .....

أفيد أنه وبكامل حريتي اوافق على المشاركة في الدراسة التي عنوانها (كبار السن والخدمات الإلكترونية في مدينة حائل - دراسة عن الفجوة الرقمية في التبني والاستخدام).

١- أؤكد أنني أُعطيت ورقة معلومات المشارك، وأُعطيت تفاصيل عن الدراسة بما في ذلك أهدافها وطرقها وتصاميمها، وأسماء وتفاصيل الاتصال بالأشخاص الرئيسيين، المخاطر والفوائد المحتملة، وكذلك الخطط المحتملة للقيام بدراسات لاحقة ذات صلة وماقد يترتب عليها من محاولة التواصل معي. لقد أُعطيت تفاصيل كاملة عن مشاركتي في الدراسة، وقد قيل لي أنه في حال وجود أي تغيير كبير في أهداف الدراسة أو تصميمها سوف يتم ابلاغي وطلب تجديد موافقتي على المشاركة من جديد.

٢- تم التأكيد على انه بإمكاني الانسحاب من الدراسة في أي وقت دون ضرر أو الحاجة إلى إعطاء اسباب.

٣- أتفهم عند إعطاء موافقتي على المشاركة في هذه الدراسة، أنه قد يكون هناك تسجيل صوتي أو مرئي أو التقاط صور.

٤- لقد أُعطيت المعلومات الكاملة حول مخاطر تعرضي لأي ضرر أو آثار ضارة.و لقد قيل لي عن الرعاية اللاحقة والدعم التي ستُقدم لي في حال حدوث ذلك، ولقد تم التأكد من أن جميع هذه الرعاية اللاحقة أو الدعم ستقدم دون أي تكلفة على المشارك.

٥- لقد قيل لي كيف سيتم التعامل مع المعلومات المتعلقة بي (البيانات التي تم الحصول عليها في أثناء الدراسة، والبيانات التي قدمتها عن نفسي): كيف سيتم الاحتفاظ به بشكل آمن، ومن الذين سوف يتمكنون من الوصول اليها، وكيف سوف يتم استخدامها.

٦- أفهم أنه إذا تم الكشف عن أي نشاط غير قانوني أو عند وجود أي إشارة إلى ظروف غير صحية والتي من شأنها وضع الآخرين في خطر، فإن الجامعة سوف تحيل المسألة إلى السلطات المختصة.

٧- لقد قيل لي أنه ربما سيتم التواصل معي في المستقبل بخصوص هذه الدراسة أو أي دراسات أخرى.

توقيع المشارك ..... التاريخ: .....

توقيع الباحث ..... التاريخ:.....

Pilot Survey Questionnaire

Survey Title: Adoption and use of e-Government Services by Older Adults of Hail City

Dear Sir/Madam, We would like to seek your co-operation in completing this survey, which is an important research project being conducted at University of Hertfordshire's Management, Leadership and Organisation department; Social Sciences, Arts and Humanities Research Unit (SSAHRI); Hertfordshire Business school, Hertfordshire, UK. Presently, all countries around the globe are facing older populations. Alongside, new Information and Communication Technologies are being introduced, which governments are also providing and using. This means that not all the populations are using the technology, as some people may not be interested, some may not have the money, or the skills to use the Internet. The purpose of the study is to identify and explain the challenges existing for older adults when using e-Services in a developing country of the Middle East, in this case Saudi Arabia, Hail City. This survey focuses on services provided to citizens by The Ministry of Interior (MOI) electronic portal (e-Portal). MOI e-Portal can be accessed at www.moi.gov.sa. Conducting this study is very important because of the fact that such areas of research have not sufficiently been investigated in my country. I humbly wish that both citizens as well as government officials of my country benefit from this proposed study. For your information, this questionnaire includes a number of questions that should take approximately 30 minutes to complete. Please checkmark (tick) all appropriate answers. If your answer is not displayed, could you please kindly state your answer in the "Other" option category. You may omit any questions that you do not wish to answer. Please be assured that any information you provide will be used for academic research purposes only. Your survey response for this research will be identified using only a code. This work has been approved by the Ethics Committee of University of Hertfordshire under the protocol number: cBUS/PG/UH/00854. I would like to take this opportunity to thank you in advance for your time, patience and co-operation. Survey participants are welcome to seek information about the outcomes of this research project by emailing the supervisor and/or the researcher (contact details below).

The supervisor:
Prof. Jyoti Choudrie
Reader of Information Systems
University of Hertfordshire
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(SyMRU)
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Hatfield Herts
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jyotichoudrie@gmail.com
Telephone: (01707) 281271.
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The researcher:
Adel Alfalah
PhD. Student of University of Hertfordshire
Business School
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6 Lisa Court, Frank's Lane
Cambridge
Cambridgeshire
CB4 1SW
Email: aas131@hotmail.com
Mobile: +447908223353 - +966532094651

Section 1: Background Information

1. Please state the age group that you belong to?

50-59
60-69
70-79
80-89
Over 90

2. Please state your gender

Male
Female

3. Please state your highest level of education

Higher Degree/Postgraduate Degree (MBA PhD MD MA MSc)
1st Degree (BA / BSc)
College Diploma
Technical Certificate
Secondary School Certificate
Primary School Certificate
Can Read and Write Arabic
Illiterate
Other (please specify)

4. What is your current employment status?

Pensioner 65+
Retired (under 65 years old)
Employed full time
Employed part time
Self-employed
Own my own business
Unemployed (for less than 6 months)
Unemployed (for medical reasons)
Unemployed (for more than 6 months)
Student (part-time)
Student (full-time)

5. Please state your current occupation.
If you are of retired/pensioner status, please select the occupation you held for the majority of your working life.

Academic/Teacher
Legislator/Manager
Agricultural/Forestry/Fishery
Plant/Machine Operator
Clerk
Services/sales
Craft/Trade
Student
Freelance
Other (please specify)

6. Which of the following do you think best describes your state of health?

Excellent
Good
Poor

7. Could you please state the ailment(s) that you have incurred due to old age?
(You may choose more than one option)

Alzheimer's Disease
Heart Disease
Arthritis
High Blood Pressure

Balance Disorders
Cancer
Eye Diseases
Ear Disorders
Depression
Dementia
Diabetes
Falls & Mobility Problems
Generalized Anxiety Disorder
Other (please specify)
High Cholesterol
Hip Fracture
Memory Loss
Menopause
Neck Fracture
Osteoarthritis
Osteoporosis
Parkinson's Disease
Stroke

Section 2 Internet Connectivity

8. Do you have an Internet connection at home?
Yes.
No, but I am planning to have an Internet connection.
No, and I am not planning to have an Internet connection.

Section 3 Internet Access

9. Do you access and use the internet?
Yes
No

Section 4 Internet Usage

10. How would you describe your level of knowledge and experience in the use of computers?
I have no knowledge or experience of computers
I am a user with little knowledge and experience
I am a user with a lot of knowledge and experience
Other (please specify)

11. How long have you been using the Internet for?
Less than 6 months
6 months to 1 year
1 year to 2 years
2 years to 3 years
Over 3 years

12. How often do you use the internet?
Daily
Several times of the day (every hour)
Several times of the day (not every hour)
Weekly

Several times of the week (three times a week)
Several times of the week (Less than three times of the week)
Monthly
Less than monthly
Other (please specify)

13. What are your reasons for using the internet? (Please select the four most important).

To book appointments
Searching Google for information
For Banking (e.g. internet banking)
For Paying bills (e.g. rent)
For Work purposes (.e.g. Paid / unpaid work done at home)
For Communication (e.g Checking Emails , Facebook, Video calling(Skype))
For Leisure
For general reading
For Travel purposes
For Entertainment purposes
For Seeking Health care information
For Interacting with government agencies (e.g Central and Local government services)
For online Shopping
Other (please specify)

14. Do any of the following ailments affect your use of the Internet? (Please select all that apply)

Vision Impairments
Learning difficulties (cannot see the words correctly)
Deafness
Arthritis of the hand
Arthritis of the fingers
Alzheimer's Disease
Balance Disorders
Ear Disorders
Other (please specify)
Dementia
Falls & Mobility Problems
Generalized Anxiety Disorder
Heart Disease
High Blood Pressure
Memory Loss
Neck Fracture
None of the above

Section 5 Do you have a tablet device?

15. Do you have a tablet device?

Yes.
No, I do not have a tablet yet, but I plan to have one.
No, and I do not intend to, or plan to have a tablet.

16. How long have you been using a tablet device?

Less than 6 months.
6 months to 1 year.
1 year to 2 years.
2 years to 3 years.
Over 3 years.

17. Who is the network provider of your tablet(s) device? (You may choose more than one option)
Saudi Telecommunication Company (STC).
Mobily.
Zeen.
Other (please specify)

18. How do you pay for your tablet device?
Pay as you go.
Pay on a monthly basis (Contract).
Other (please specify)

19. How often do you use the your tablet device?
Once a day.
More than once a day.
Weekly.
I only use it when I need to.
I rarely use it.
I never use it.
Other (please specify)

20. Where do you get information regarding the use of your tablet device? (You may choose more than one option)
Word of mouth from friends and family.
Tablets stores.
Media –TV, Radio and Newspapers.
Magazines.
Online social network.
Professional technology review websites.
Sales person
Other (please specify)

21. How long did it take you to get comfortable or familiar with using the basic functionalities of your present tablet device? Basic functionalities are described as: using the Internet services, and/or using communication services such as, email & Skype.
Less than a day
1 day – 1 week
1 week – 2 weeks
2 weeks – 1 month
1 month – 3 months
More than 3 months

Section 6 I do plan to get a tablet device

22. What are the reasons that you plan to use a tablet device? (You may choose more than one option)
I will get an upgrade from my provider.
I want a handy device that can do many things such as taking a photograph and surfing the web.
Most of my friends and/or friends have used tablets, and have convinced me to get one.
I want to use a tablet to contact my friends and/or family.
My new job or new position requires me to use a tablet.
I want to use a tablet to help with my well-being or health.
I travel a lot and the tablet will help me while travelling.
My new tablet will have a larger screen, which will be easy for me to view and use.
Other (please specify)

23. What are your plans for using the tablet device to interact with the MOI through its e-Portal? (You may choose more than one option)
I intend to use the tablet device as the sole channel to interact with the MOI through its e-Portal.
I intend to use the tablet device to interact with the MOI through its e-Portal as much as possible.
I am not sure.
I do not intend to use the tablet device to interact with the MOI through its e-Portal.
Other (please specify)

24. What is (are) your consideration(s) when buying a tablet device? (You may choose more than one option)
Appearance (such as colour or material).
Brand (such as Apple & Samsung).
Price of the tablet.
Camera capabilities.
Operating System (Such as iOS & Android).
Operating Speed.
Screen Size.
Screen Resolution.
Weight.
Battery life.
Size of Memory in the tablet to store files such as movies & documents.
Quality of Applications (apps).
Price of Applications (apps).
Number of Applications (apps) available in the app Market.
Support LTE (4G).
Other (please specify)

Section 7 I do not plan to get a tablet device.

25. What is/are the reasons/s for not getting a tablet? (You may choose more than one option)
I am too old for a tablet.
It is too much of an effort to use a tablet.
A tablet is too complicated and difficult to use.

I do not think a tablet is useful.
Physical discomfort or accessibility problems.
The cost of using a tablet – I do not want to spend a lot of money when using a tablet.
I just want to relax after my working hours.
I do not feel comfortable using small screens and keyboards (compared to desktop computers).
I do not know much about how to use a tablet.
I have other devices such as a laptop that can function as well, or better than a tablet.
Using a tablet does not fit with my lifestyle.
Other (please specify)

26. Factors that may encourage future use of a tablet device. (You may choose more than one option)
Nothing/ will never use a tablet in the future.
Free training.
Reduce cost of a tablet.
Reduce cost of monthly contracts.
Other (please specify)

Section 8 Primary Influence: Influence of the people who are important to you.

27. Please indicate to what extent you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) People who are important to me (e.g. friends, family and colleagues) think that I should use the Ministry of Interior (MOI) e-Portal.

Disagree 1 2 3 4 5 6 7 Agree

b) People who influence my behaviour (e.g. friends, family and colleagues) think that I should use MOI e-Portal. -www.moi.gov.sa –

Disagree 1 2 3 4 5 6 7 Agree

c) People whose opinions I value (e.g. friends, family and colleagues) think that I should use MOI e-Portal. -www.moi.gov.sa -

Disagree 1 2 3 4 5 6 7 Agree

Section 9 Perceived Cyber-risk: What are the risks of using online systems.

28. Please indicate to what extent you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) Using MOI e-Portal service could expose me to online frauds (e.g. stealing personal information such as by using a credit card when shopping or banking).

Disagree 1 2 3 4 5 6 7 Agree

b) Using MOI e-Portal service could expose me to identity theft (e.g. online impersonation in which a person pretend to be you, assuming another person's identity, fabricating an e-mail or Facebook account, Twitter account, etc.).

Disagree 1 2 3 4 5 6 7 Agree

c) Use of MOI e-Portal service could expose me to cyber criminals (people who commit online crimes).

Disagree 1 2 3 4 5 6 7 Agree

d) Using MOI e-Portal service could expose me to malicious attacks (e.g. hard drive damage, gaining access to private computer systems, viruses).

Disagree 1 2 3 4 5 6 7 Agree

Section 10 Perceived Website Assistance: Does the MOI e-Portal facilitate your activities?

29. Please indicate to what extent you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) I can get the information that I am interested in on this website. (MOI e-Portal)

Disagree 1 2 3 4 5 6 7 Agree

b) This website (MOI e-Portal) is easy-to-navigate (e.g. clickable links, in-site search feature, clear presentation)

Disagree 1 2 3 4 5 6 7 Agree

c) This website (MOI e-Portal) makes the exchange of information between me and the government departments easy

Disagree 1 2 3 4 5 6 7 Agree

d) The way this website (MOI e-Portal) displays its services is efficient (e.g. clearly divided categories, demo clips and/or images, accurate titles)

Disagree 1 2 3 4 5 6 7 Agree

e) This website has good text size

Disagree 1 2 3 4 5 6 7 Agree

f) This website has good colours that I can see

Disagree 1 2 3 4 5 6 7 Agree

g) There is a good search facility on the webpage

Disagree 1 2 3 4 5 6 7 Agree

h) There is a good frequently answered section that I can consult for any confusing information

Disagree 1 2 3 4 5 6 7 Agree

i) The page or portal downloads very easily, which saves me time

Disagree 1 2 3 4 5 6 7 Agree

j) The page or portal download very easily, which saves me effort

Disagree 1 2 3 4 5 6 7 Agree

k) It is a new service that I am very interested in trying

Disagree 1 2 3 4 5 6 7 Agree

Section 11 Compatibility: Compatibility of MOI e-Portal with your values, beliefs, experiences and needs.

30. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) I think using MOI e-Portal services fits well with the way that I like to gather information from the government.

Disagree 1 2 3 4 5 6 7 Agree

b) I think using MOI e-Portal services fits well with the way that I like to interact with the government

Disagree 1 2 3 4 5 6 7 Agree

c) Using MOI e-Portal services to interact with the government fits into my lifestyle (e.g. culture, interests, values).

Disagree 1 2 3 4 5 6 7 Agree

d) Using MOI e-Portal services to interact with the government is incompatible with how I like to do things.

Disagree 1 2 3 4 5 6 7 Agree

Section 12 Relative Advantage: MOI e-Portal Vs. Traditional ways of interaction with the government.

31. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) Using MOI e-Portal services enhances my efficiency in gathering information from the government (e.g. requires less time and/or effort)

Disagree 1 2 3 4 5 6 7 Agree

b) Using MOI e-Portal services enhances my efficiency in interacting with the government (e.g. requires less time and/or effort)

Disagree 1 2 3 4 5 6 7 Agree

c) Using MOI e-Portal services does not make it easy to gather information from the government

Disagree 1 2 3 4 5 6 7 Agree

d) Using MOI e-Portal services makes it easier to interact with the government

Disagree 1 2 3 4 5 6 7 Agree

e) Using MOI e-Portal services gives me greater control over my interaction with the government

Disagree 1 2 3 4 5 6 7 Agree

Section 13 Image: The link between an MOI user and his/her image (status symbol).

32. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree

a) People who use the web to gather information from the government have a high profile (e.g. an outstanding and/or a recognised person in society)

Disagree 1 2 3 4 5 6 7 Agree

b) People who use MOI e-Portal services have a high profile

Disagree 1 2 3 4 5 6 7 Agree

c) People who use the web to gather information from the government have more prestige than those who do not (high status or reputation)

Disagree 1 2 3 4 5 6 7 Agree

d) People who use MOI e-Portal services have less prestige than those who do not (less status or reputation)

Disagree 1 2 3 4 5 6 7 Agree

e) Interacting with the government over the web enhances a person's social status

Disagree 1 2 3 4 5 6 7 Agree

Section 14 Complexity: Complexity of MOI e-Portal.

33. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) Learning to interact with MOI e-Portal is easy for me (e.g. In comparison to other web portals you have dealt with)

Disagree 1 2 3 4 5 6 7 Agree

b) I believe interacting with MOI e-Portal is a clear and understandable process

Disagree 1 2 3 4 5 6 7 Agree

c) I find MOI e-Portal to be flexible to interact with (e.g. fits with multiple screen sizes, easy to navigate, clear layout)

Disagree 1 2 3 4 5 6 7 Agree

d) It is easy for me to become skillful at using MOI e-Portal (e.g. having good knowledge and experience to deal with the portal)

Disagree 1 2 3 4 5 6 7 Agree

e) I find MOI e-Portal difficult to use

Disagree 1 2 3 4 5 6 7 Agree

Section 15 Use Intentions: Intentions to use MOI e-Portal

34. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree

a) I will use MOI e-Portal for gathering government information

Disagree 1 2 3 4 5 6 7 Agree

b) I will use MOI e-Portal services provided over the Internet, Web, portal

Disagree 1 2 3 4 5 6 7 Agree

c) Interacting with MOI e-Portal over the internet, Web, portal is something that I would do

Disagree 1 2 3 4 5 6 7 Agree

d) I will not hesitate to provide information to the MOI e-Portal

Disagree 1 2 3 4 5 6 7 Agree

Section 16 Reasons for not accessing the Internet.

35. What are your reasons for not accessing the Internet? (You may choose more than one

option)
Just not interested
I do not have the skills
I do not feel comfortable using the internet
Privacy worries (criminals might take control of my personal information)
Bad experiences with hackers/virus
Too old to learn
I am too busy
Other (please specify)

Section 17 Reasons for not planning to have an Internet connection at home

36. What are the reasons for not planning to have an Internet connection at home? (You may choose more than one option)
I am not interested
I do not have the skills
Because it is expensive
I do not feel comfortable using the internet
Privacy worries (criminals might take control of my personal information)
Bad experiences with hackers/virus
Too old to learn
I am too busy
Other (please specify)

Section 18 Plans to have an Internet connection.

37. What are the reasons that are making you plan to have an Internet connection at home?
To be able to get any information I want.
To participate in social networks.
To communicate through email, Skype, Yahoo,
To use it for entertainment.
To use it for online education.
To use it for online banking.
To use it for electronic government services.
Other (please specify)

38. What type of Internet connection do you plan to acquire?

DSL	cable
Satellite	fixed/broadcast wireless
Cellular	dial-up

I'm not sure
Other (please specify)

Section 19 Trust: Trust of the Internet

39. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) The Internet has enough safeguards (e.g. firewalls & security certificate) to make me feel comfortable using it to transact personal information with MOI e-Portal

Disagree 1 2 3 4 5 6 7 Agree

b) I feel assured that legal and technological structures adequately protect me from problems on the Internet. (e.g. related protection regulations, terms and conditions agreement)

Disagree 1 2 3 4 5 6 7 Agree

c) In general, the Internet is now a robust and safe environment in which to transact with MOI e-Portal (e.g. Padlock icons symbolising a secure web transaction)

Disagree 1 2 3 4 5 6 7 Agree

Section 20 Trust of the government

40. Please indicate to what extent you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) I think I can trust government agencies (believe in the integrity and ability of the agency providing the service)

Disagree 1 2 3 4 5 6 7 Agree

b) Government agencies can be trusted to carry out online transactions faithfully

Disagree 1 2 3 4 5 6 7 Agree

c) I trust government agencies to keep my best interests in mind

Disagree 1 2 3 4 5 6 7 Agree

d) In my opinion, government agencies are trustworthy

Disagree 1 2 3 4 5 6 7 Agree

Section 21 Disposition to Trust: Tendency to believe or not to believe in others

41. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) I generally do not trust other people

Disagree 1 2 3 4 5 6 7 Agree

b) I generally have faith in humanity

Disagree 1 2 3 4 5 6 7 Agree

c) I feel that people are generally reliable

Disagree 1 2 3 4 5 6 7 Agree

d) In general I trust other people unless they give me reason not to

Disagree 1 2 3 4 5 6 7 Agree

End of Questions.

Thank you very much for your valuable time, co-operation and patience in completing this questionnaire! If you have any questions, comments, suggestions or would like to find out about the results of this research, please do not hesitate in getting in touch with us at:

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Pilot Survey Questionnaire – Arabic Version

تقَبُّل خدمات الحكومة الإلكترونية من قِبَل المواطنين البالغين من العمر ٥٠ سنة فما فوق في مدينة حائل

السادة الاعزّاء
تحية طيبة وبعد،

نود ان نلتمس تعاونكم في الإجابة عن هذا الاستطلاع، وهو مشروع بحثي مهم يُجرى في قسم القيادة والإدارة والتنظيم (SSAHRI) بجامعة هيرتفوردشاير ؛ وحدة العلوم الاجتماعية والفنون والبحوث الإنسانية ؛ كلية هيرتفوردشاير لإدارة الأعمال، هيرتفوردشاير، المملكة المتحدة. الناس في كل الدول في جميع أنحاء العالم أصبحوا يُعمِّرون لسنوات أطول. وإلى جانب ذلك ، تُقَدَّم حالياً تكنولوجيات جديدة في مجال المعلومات والإتصالات، وتقوم الحكومات أيضاً بتوفير هذه التكنولوجيات واستخدامها. وهذا يعني أنه ليس كل السكان يستخدمون هذه التكنولوجيا، حيث أن بعض الناس قد لايكونون مهتمين بها، وقد لا يمتلك بعضهم ما يكفي من المال او المهارات اللازمة لاستخدام الإنترنت. والغرض من هذه الدراسة هو تحديد وشرح التحديات القائمة التي تواجه كبار السن عند استخدام الخدمات الإلكترونية في احدى الدول النامية في الشرق الأوسط، ونتحدث هنا عن المملكة العربية السعودية، وتحديداً مدينة حائل. ويركز هذا الاستطلاع على الخدمات التي تقدمها البوابة الالكترونية الخاصة بوزارة الداخلية للمواطنين. وعنوان هذه البوابة الإلكترونية على شبكة الانترنت هو www.moi.gov.sa .

إجراء هذه الدراسة أمر مهم جداً لأن هذه المجالات البحثية لم تحظ في بلدي بما يكفي من البحث والاستقصاء. أتمنى وبكل تواضع ان يستفيد كلٌّ من المواطنين والمسؤولين الحكوميين في بلدي من هذه الدراسة المقترحة. ومن باب العلم، يتضمن هذا الاستطلاع عدداً من الاسئلة التي سوف تستغرق الإجابة عنها نحو ٢٥ دقيقة . يُرجى اختيار الاجابات المناسبة عن طريق وضع علامة امامها. وإذا لم تجد إجابتك ضمن الخيارات المعروضة ، فيُرجى التكرم بذكر اجابتك في فئة الخيار المسمى "غير ذلك". ولك أن تترك أي اسئلة لاترغب في الإجابة عنها. وثِق تماماً أن اي معلومات تقدمها سوف تُستخدم لأغراض البحث العلمي فقط. وقد حصل هذا الاستطلاع على موافقة لجنة الأخلاقيات التابعة لجامعة هيرتفوردشاير بالبروتوكول رقم .00854/cBUS/PG/UH

وأود أن اغتنم هذه الفرصة لأشكركم مقدماً على وقتكم وسعة صدركم وتعاونكم. ويمكن للمشاركين في هذا الاستطلاع أن يطلبوا الحصول على معلومات عن نتائج هذا المشروع البحثي عن طريق مراسلة المشرف او الباحث او كليهما عبر البريد الإلكتروني.

المشرف: البروفسور جيوتي جاودري استاذ نظم المعلومات جامعة هيرتفوردشاير كلية إدارة الأعمال وحدة أبحاث إدارة النظام (SyMRU) DeHavilland campus Hatfield Herts AL10 9EU البريد الإلكتروني: j.choudrie@herts.ac.uk، jyotichoudrie@gmail.com الهاتف: +441707281271	الباحث: عادل الفلاح طالب دكتوراه في جامعة هيرتفوردشاير كلية إدارة الأعمال العنوان البريدي: 6 Lisa Court, Frank's Lane، Cambridgeshire،Cambridge CB4 1SW البريد الإلكتروني: aas131@hotmail.com الهاتف الجوال: +966532094651 / +447908223353

معلومات أساسية

1. يُرجى تحديد الفئة العمرية التي تنتمي إليها

٥٠-٥٩
٦٠-٦٩
٧٠-٧٩
٨٠-٨٩
فوق ٩٠

2. يُرجى تحديد الجنس
ذكر
أنثى

3. يُرجى تحديد المؤهل العلمي
درجة عليا / درجة دراسات عليا - ماجستير أو دكتوراة
بكالوريوس
دبلوم جامعي
شهادة فنية
الشهادة الثانوية
الشهادة الإعدادية
تستطيع القراءة والكتابة باللغة العربية
أُمِّي
غير ذلك (يُرجى التحديد)

4. ماوضعك الوظيفي الحالي
متقاعد / فوق ٦٥ سنة
متقاعد / تحت ٦٥ سنة
موظف دوام كامل
موظف دوام جزئي
مهنة حرة
لي عملي الخاص
بلا عمل / لأقل من ٦ أشهر
بلا عمل / لأكثر من ٦ أشهر
بلا عمل / لأسباب طبية
طالب متفرغ
طالب غير متفرغ
غير ذلك (يُرجى التحديد)

5. يُرجى تحديد وظيفتك الحالية، وإذا كنت متقاعداً يُرجى تحديد الوظيفة التي شغلتها في معظم حياتك الوظيفية
أكاديمي / معلم
مُشرّع / مدير
زراعي
موظف
خدمات / مبيعات
حرفة / تجارة

عمل حر
طالب
غير ذلك (يُرجى التحديد)

6. ما أنسب وصف لحالتك الصحية مما يلي

ممتازة
جيدة
ضعيفة

7. هل يمكنك ذكر المرض أو الأمراض التي عانيت منها بسبب التقدم في السن

مرض الزهايمر
أمراض القلب
إلتهاب المفاصل
ارتفاع ضغط الدم
اضطرابات في التوازن
ارتفاع الكوليسترول
السرطان
أمراض العيون
فقدان الذاكرة
اضطرابات في الأذن
اكتئاب
مرض السكري
تخلخل العظم
السقوط ومشكلات في الحركة
الشلل الرعاش
القلق
سكتة دماغية
لا شيء مما سبق

الإتصال بالإنترنت

8. لديك إتصال بالإنترنت في المنزل

نعم
لا ، ولكني أنوي توفير اتصال بالانترنت في المنزل
لا ، ولا أنوي توفير اتصال بالإنترنت في المنزل

الدخول الى الإنترنت

9. هل تقوم بالدخول الى الإنترنت واستخدامه

نعم
لا

استخدام الإنترنت

10. كيف تصف مستوى معرفتك وخبرتك باستخدام أجهزة الحاسوب

ليس لدي أي معرفة أو خبرة باستخدام اجهزة الحاسوب
أنا مستخدم للحاسوب ذو معرفة وخبرة ضئيلتين
أنا مستخدم للحاسوب ذو معرفة وخبرة كبيرتين
غير ذلك (يُرجى التحديد)

11. منذ متى وأنت تستخدم الإنترنت

أقل من ستة أشهر
من ستة أشهر إلى عام
من عام الى عامين
من عامين إلى ثلاثة أعوام
أكثر من ثلاثة أعوام

12. ما معدل إستخدامك للإنترنت

يومياً
مرات عديدة يومياً / كل ساعة
مرات عديدة يومياً / ليس كل ساعة
أسبوعياً
مرات عديدة أسبوعياً / ثلاث مرات أسبوعياً
مرات عديدة أسبوعياً / أقل من ثلاث مرات
شهرياً
أقل من شهرياً

13. ما دوافعك لإستخدام الإنترنت / يُرجى اختيار اهم اربعة خيارات

للقراءة العامة
لأغراض السفر
لأغراض التسلية
للبحث عن معلومات خاصة بالرعاية الصحية
للتفاعل مع الهيئات الحكومية / مثل الخدمات الحكومية المركزية والمحلية
للتسوق الإلكتروني
غير ذلك (يُرجى التحديد)

لحجز المواعيد
استخدام محركات البحث للبحث عن معلومات
للأعمال المصرفية / مثل الخدمات المصرفية الإلكترونية
لدفع الفواتير
لأغراض العمل / مثل الأعمال المدفوعة او الغير مدفوعة التي تُنجز من المنزل
للتواصل / مثل فحص البريد الإلكتروني ، والفيس بوك ، ومكالمات الفيديو مثل سكايب
للرفاهية

14. هل يتأثر استخدامك للإنترنت بأي من الأمراض التالية / يُرجى اختيار جميع الخيارات التي تنطبق

الزهايمر
ارتفاع ضغط الدم
فقدان الذاكرة
اضطرابات في التوازن
مشاكل في الرقبة
اضطرابات في الأذن
لاشيء مما سبق
غير ذلك (يُرجى التحديد)

ضعف الرؤية / رؤية الشاشة ، النصوص
الموجودة في الشاشة ، ألوان الشاشة
صعوبات التعلم / عدم التمكن من رؤية الكلمات
بشكل صحيح
السقوط ومشكلات في الحركة
الصمم
اضطرابات القلق
التهاب مفاصل اليد
أمراض القلب
التهاب مفاصل الأصابع

هل لديك جهاز لوحي

15. هل لديك جهاز لوحي / مثال: الآيباد

نعم

لا، ليس لدي جهاز لوحي حتى الآن ولكن انوي اقتناءه
لا، ولا انوي أو اخطط لاقتناء جهاز لوحي

16. منذ متى وأنت تستخدم الجهاز اللوحي

أقل من ٦ أشهر
من ٦ أشهر إلى عام
من عام الى عامين
من عامين الى ثلاثة أعوام
أكثر من ثلاثة أعوام

17. مالشبكة التي تُزود جهازك اللوحي بخدمة الإنترنت / يمكنك اختيار أكثر من خيار واحد

شركة الإتصالات السعودية **STC**
شركة موبايلي
شركة زين
غير ذلك (يُرجى التحديد)

18. ماهو نظام الدفع الخاص بجهازك اللوحي

الدفع حسب الإستخدام
الدفع على أساس شهري / عقد
غير ذلك (يُرجى التحديد)

19. ماهو معدل إستخدامك للجهاز اللوحي

أستخدمه مرة واحدة في اليوم
أستخدمه أكثر من مرة في اليوم
أستخدمه بشكل أسبوعي
أستخدمه فقط عند حاجتي إليه
نادراً ماأستخدمه
لا أستخدمه أبداً
غير ذلك (يُرجى التحديد)

20. من أين تحصل على معلومات بشأن إستخدام جهازك اللوحي / يمكنك إختيار أكثر من خيار واحد
توصية شخصية من الأصدقاء أو العائلة
متاجر الأجهزة اللوحية
وسائل الإعلام / التلفاز، والراديو ،ا لمجلات والجرائد
الشبكات الإجتماعية على الإنترنت
مواقع تقييم التكنولوجيا الإحترافية
بائع
غير ذلك (يُرجى التحديد)

21. كم استغرقت من الوقت لتعتاد على استخدام الوظائف الأساسية لجهازك اللوحي الحالي بسهولة؟
(تُوصف الوظائف الأساسية بأنها: استخدام خدمات الإنترنت، أو استخدام خدمات التواصل مثل البريد الإلكتروني وسكايب)

أقل من يوم
من أسبوعين الى شهر
من يوم الى اسبوع
من شهر الى ثلاثة أشهر
من أسبوع الى أسبوعين
أكثر من ثلاثة أشهر

أخطط لإقتناء جهاز لوحي

22. ما دوافعك للتخطيط لاستخدام جهاز لوحي / يمكنك اختيار أكثر من خيار واحد

سأحصل على عرض جيد من مزود الخدمة
أود اقتناء جهاز يدوي يقوم بعمل الكثير من الأشياء مثل التقاط الصور، وتصوير الفيديو، وتصفح الإنترنت
معظم أصدقائي استخدموا الأجهزة اللوحية، وأقنعوني باقتناء جهاز لوحي
أود استخدام الجهاز اللوحي للإتصال بالأصدقاء والعائلة
تتطلب وظيفتي الجديدة أو منصبي الجديد استخدام جهاز لوحي
أود استخدام الجهاز اللوحي للمساعدة في تحسين مستوى رفاهيتي أو صحتي
كثيراً ما أسافر ، وسيساعدني الجهاز اللوحي أثناء سفري
سيحتوي الجهاز اللوحي الجديد الخاص بي على شاشة أكبر ، مما يسهل عمليتيْ الرؤية والإستخدام
غير ذلك (يُرجى التحديد)

23. ماخططك لاستخدام الجهاز اللوحي من أجل التفاعل مع وزارة الداخلية عبر بوابتها الإلكترونية / يمكنك اختيار أكثر من خيار واحد

انوي استخدام الجهاز اللوحي ليكون قناتي الوحيدة للتفاعل مع وزارة الداخلية عبر بوابتها الإلكترونية
انوي استخدام الجهاز اللوحي للتفاعل مع وزارة الداخلية عبر بوابتها الإلكترونية كلما أمكن
لست متأكداً
لا أنوي استخدام الجهاز اللوحي للتفاعل مع وزارة الداخلية عبر بوابتها الإلكترونية
غير ذلك (يُرجى التحديد)

24. ما الأمور التي تضعها في اعتبارك عند شراء جهاز لوحي / يمكنك إختيار أكثر من خيار واحد

الوزن
عمر البطارية
حجم الذاكرة الموجودة في الجهاز اللوحي لتخزين الملفات مثل الأفلام والمستندات
جودة التطبيقات
سعر التطبيقات
عدد التطبيقات المتاحة في سوق التطبيقات
دعم التطوير طويل الأمد / الجيل الرابع
الشكل / مثل اللون أو المادة
العلامة التجارية / مثل ابل و سامسونج
سعر الجهاز
إمكانيات الكاميرا
نظام التشغيل / مثل نظام آي او اس ونظام اندرويد
سرعة التشغيل

حجم الشاشة

مستوى دقة الشاشة

غير ذلك (يُرجى التحديد)

لا أخطط لإقتناء جهاز لوحي

25. ما دوافعك لعدم اقتناء جهاز لوحي / يمكنك اختيار أكثر من خيار واحد

بسبب كِبر السن لا يمكنني استخدام جهاز لوحي

يأخذ استخدام الجهاز اللوحي مني مجهوداً كبيراً

الجهاز اللوحي معقد وصعب الإستخدام

لا أعتقد أن الجهاز اللوحي مفيد

مشقة جسدية أو مشكلات في الدخول

تكلفة استخدام الجهاز اللوحي / لا أرغب في انفاق لكثير من المال عند استخدام الجهاز اللوحي

ود فقط أن انال قسطاً من الراحة بعد ساعات عملي

لا أشعر بالراحة عند استخدام شاشات ولوحات مفاتيح صغيرة نسبياً / إذا ما قورنت بالحاسوب المكتبي

لا أعلم الكثير عن استخدام الجهاز اللوحي

لدي أجهزة أخرى مثل جهاز الكمبيوتر المحمول (اللابتوب) الذي يؤدي وظيفته كالجهاز اللوحي أو أفضل منه

استخدام الجهاز اللوحي لا يتناسب مع اسلوب حياتي

غير ذلك (يُرجى التحديد)

26. العوامل التي تشجع على الاستخدام المستقبلي للجهاز اللوحي / يمكنك اختيار اكثر من خيار واحد

لا شيء / لن استخدم الجهاز اللوحي في المستقبل

التدريب المجاني على استخدام الجهاز اللوحي

انخفاض تكلفة الجهاز اللوحي

انخفاض تكلفة الإشتراكات الشهرية

غير ذلك (يُرجى التحديد)

التأثير الأولي: تأثير الأشخاص المهمين بالنسبة إليك

27. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً)، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

www.moi.gov.sa يرى الأشخاص المهمين بالنسبة لي (مثل : أصدقائي وزملائي وأسرتي) أنني ينبغي أن استخدم البوابة الإلكترونية لوزارة الداخلية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يرى الأشخاص الذين يؤثرون في سلوكي (مثل : أصدقائي وزملائي وأسرتي) أنني ينبغي أن استخدم البوابة الإلكترونية لوزارة الداخلية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يرى أولئك الذين أُقدِّر آراءهم (مثل : أصدقائي وزملائي وأسرتي) أنني ينبغي أن استخدم البوابة الإلكترونية لوزارة الداخلية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

المخاطر الإلكترونية الملموسة : ما مخاطر استخدام أنظمة الإنترنت

28. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

قد يُعرّضني استخدام خدمات البوابة الإلكترونية لوزارة الداخلية الى الإحتيال عبر الإنترنت/ مثل سرقة البيانات الشخصية كأن يكون ذلك باستخدام البطاقة الإئتمانية عند التسوق أو اتمام بعض العمليات المصرفية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

قد يُعرّضني استخدام خدمات البوابة الإلكترونية لوزارة الداخلية الى سرقة الهوية / مثل انتحال الشخصية عبر الإنترنت والتي يدّعي فيها شخصٌ ما أنه أنت ، منتحلاً هويتك ، ويُزيّف البريد الإلكتروني ، أو حساب الفيسبوك ، أو حساب تويتر ، وغيرها

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

قد يُعرّضني استخدام خدمات البوابة الإلكترونية لوزارة الداخلية الى قراصنة الإنترنت / اولئك الذين يرتكبون جرائم عبر الإنترنت

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

قد يُعرّضني استخدام خدمات البوابة الإلكترونية لوزارة الداخلية الى هجمات كيديّة / مثل إتلاف محرك الأقراص الصلبة ، أو الدخول الى أنظمة الحاسب الآلي الشخصية ، أو الفيروسات

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

المساعدة الملموسة بالموقع الإلكتروني لوزارة الداخلية

29. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً).

يمكنني الحصول على المعلومات التي أهتم بها من خلال هذا الموقع الإلكتروني / البوابة الإلكترونية لوزارة الداخلية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

البوابة الإلكترونية لوزارة الداخلية سهلة التصفح / مثل وجود روابط قابلة للنقر ، وميزة البحث داخل الموقع ، والعرض الواضح

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يعمل هذا الموقع الألكتروني على تبادل المعلومات بيني وبين الدوائر الحكومية بسهولة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

الطريقة التي يعرض بها هذا الموقع الإلكتروني خدماته، طريقة فعّالة / مثل : الأجزاء مُقسّمة بشكل واضح ، مقاطع وصور توضيحية للخدمات ، والعناوين دقيقة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

نصوص هذا الموقع الإلكتروني تظهر بحجم جيد

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يتمتع هذا الموقع الألكتروني بألوان جيدة يمكنني رؤيتها

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

تتوفر في هذا الموقع آلية بحث جيدة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

هناك قسم جيد للإجابات المتكررة التي يمكنني الرجوع إليها عند تشتت المعلومات

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

تعمل خاصية التحميل بالبوابة الإلكترونية بشكل مبسط ، مما يوفر وقتي

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

تعمل خاصية التحميل بالبوابة الإلكترونية بشكل مبسط ، مما يوفر جهدي

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

إنها خدمة جديدة وأهتم بتجربتها

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

تَوافق البوابة الإلكترونية لوزارة الداخلية مع قِيَمك ومعتقداتك وخبراتك واحتياجاتك

30. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

أرى أن استخدام خدمات البوابة الإلكترونية لوزارة الداخلية يتناسب جيداً مع الطريقة التي أُحب أن أجمع بها معلومات من الحكومة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

أرى أن استخدام خدمات البوابة الإلكترونية لوزارة الداخلية يتناسب جيداً مع الطريقة التي أُحب أن أتفاعل بها مع الحكومة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

استخدام خدمات البوابة الإلكترونية لوزارة الداخلية للتفاعل مع الحكومة يتناسب مع أسلوب حياتي / مثل الثقافة ، والإهتمامات ، والقِيَم

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

استخدام خدمات البوابة الإلكترونية لوزارة الداخلية للتفاعل مع الحكومة لا يتوافق مع الطريقة التي أُحب أن انجز بها مهماتي

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

الفائدة النسبية للبوابة الإلكترونية لوزارة الداخلية مقابل الطرق التقليدية للتفاعل مع الحكومة

31. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

يُعزّز استخدام خدمات البوابة الإلكترونية لوزارة الداخلية من كفاءتي في جمع معلومات من الحكومة / كأن يتطلب ذلك القليل من الوقت والجهد مقارنةً بالطرق التقليدية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يُعزّز استخدام خدمات البوابة الإلكترونية لوزارة الداخلية من كفاءتي في التفاعل مع الحكومة / كأن يتطلب ذلك القليل من الوقت والجهد مقارنةً بالطرق التقليدية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

لا يعمل استخدام خدمات البوابة الإلكترونية لوزارة الداخلية على تيسير جمع معلومات من الحكومة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يجعل استخدام خدمات البوابة الإلكترونية لوزارة الداخلية الأمر سهلاً في التفاعل مع الحكومة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يتيح لي استخدام خدمات البوابة الإلكترونية لوزارة الداخلية تحكماً أكبر في التفاعل مع الحكومة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

الإنطباع العام: العلاقة بين مستخدم البوابة الإلكترونية لوزارة الداخلية وصورته الذهنية

-المقصود هنا بالإنطباع العام، أن استخدام خدمات البوابة الألكترونية لوزارة الداخلية قد يكون دلالة على المنزلة الرفيعة.

32. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي

يتمتع الأشخاص الذين يستخدمون الإنترنت لجمع معلومات من الحكومة بمكانة رفيعة / مثل: شخص مشهور أو معروف في المجتمع

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يتمتع الأشخاص الذين يستخدمون خدمات البوابة الألكترونية لوزارة الداخلية بمكانة رفيعة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

يتمتع الأشخاص الذين يستخدمون الويب (المواقع) لجمع معلومات من الحكومة بمكانة أكبر من غيرهم / مكانة عالية أو سمعة حسنة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

يتمتع الأشخاص الذين يستخدمون خدمات البوابة الألكترونية لوزارة الداخلية بمكانة أقل من غيرهم / مكانة أقل أو سمعة أقل

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

التفاعل مع الحكومة عبر الإنترنت يعزّز الوضع الإجتماعي للشخص

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

الصعوبة والتعقيد: تعقيدات البوابة الإلكترونية لوزارة الداخلية

33. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

من السهل تعلّم كيفية التفاعل مع البوابة الإلكترونية لوزارة الداخلية / إذا ما قورنت بالبوابات الإلكترونية الأخرى التي تفاعلت معها مثلاً

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أعتقد أن التفاعل مع البوابة الإلكترونية لوزارة الداخلية عملية واضحة ومفهومة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أرى أن البوابة الإلكترونية لوزارة الداخلية مرنة في التفاعل معها / على سبيل المثال: تتناسب مع أحجام الشاشة المتعددة، وسهلة التصفح، وذات تصميم واضح

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أرى أنه من السهل أن اصبح محترفاً في استخدام البوابة الإلكترونية لوزارة الداخلية / كأن أكون صاحب معرفة وخبرة في كيفية التعامل مع البوابة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أرى أن استخدام البوابة الإلكترونية لوزارة الداخلية أمر صعب

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أغراض الإستخدام: أغراض استخدام البوابة الإلكترونية لوزارة الداخلية

34. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧. الى (متفق تماماً).

سأستخدم البوابة الإلكترونية لوزارة الداخلية في جمع المعلومات الحكومية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

التفاعل مع البوابة الإلكترونية لوزارة الداخلية هو أمر سأقوم به

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

لن أتردد في تزويد البوابة الإلكترونية لوزارة الداخلية بالمعلومات

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أسباب عدم استخدام الإنترنت

35. ما أسباب عدم استخدامك للإنترنت / يمكنك اختيار اكثر من خيار واحد

فقط لا أهتم
ليس لدي المهارات اللازمة
لا أشعر بالراحة عند استخدام الإنترنت
مخاوف شخصية / قد يستولي قراصنة الإنترنت على بياناتي الشخصية
تجارب سيئة مع القراصنة أو الفيروسات
تقدمت بالسن لدرجة كبيرة ولا يمكنني التعلّم
مشغول بدرجة كبيرة
غير ذلك (يُرجى التحديد)

أسباب عدم التخطيط لاقتناء إتصال بالإنترنت في المنزل

36. ما أسباب عدم تخطيطك لإقتناء اتصال إنترنت في المنزل / يمكنك اختيار أكثر من خيار واحد

لا أهتم
ليس لديّ المهارات اللازمة
لأنه مُكلف مادياً
لا أشعر بالراحة عند استخدام الإنترنت
مخاوف شخصية / قد يستولي قراصنة الإنترنت على بياناتي الشخصية
تجارب سيئة مع القراصنة أو الفيروسات
تقدمت بالسن لدرجة كبيرة ولا يمكنني التعلّم
مشغول بدرجة كبيرة
غير ذلك (يُرجى التحديد)

التخطيط لإقتناء اتصال إنترنت في المنزل

37. ما الأسباب التي تجعلك تُخطِّط لإقتناء اتصال انترنت في المنزل / يمكن اختيار أكثر من خيار واحد

لكي أتمكن من الحصول على أي معلومات اريدها
للمشاركة في شبكات التواصل الإجتماعي
للتواصل عبر البريد الإلكتروني، وسكايب ، والياهو
لإستخدامه للتسلية
لإستخدامه للتعليم الإلكتروني
لإستخدامه للعمليات المصرفية الإلكترونية
لإستخدامه من أجل الخدمات الحكومية الإلكترونية
غير ذلك (يُرجى التحديد)

38. ما نوع إتصال الإنترنت الذي تود الإشتراك به

دي إس ال / DSL
كابل
القمر الصناعي
بث هوائي ثابت
جوال
الطلب الهاتفي
لست متأكداً
غير ذلك (يُرجى التحديد)

الثقة في الإنترنت

39. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

يتمتع الإنترنت بأساليب وقائية كافية (مثل جدران الحماية، وشهادات الأمان) تجعلني أشعر بالإطمئنان عند استخدام الإنترنت لنقل البيانات الشخصية عبر البوابة الإلكترونية لوزارة الداخلية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أشعر بالإطمئنان لوجود هياكل قانونية وفنية كافية لحمايتي من المشكلات التي قد تواجهني عبر الإنترنت / مثل لوائح الحماية ذات الصلة، واتفاق الشروط والأحكام

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

بشكل عام ، الإنترنت الآن بيئة آمنة ومنيعة حيث يمكنك التعامل مع البوابة الإلكترونية لوزارة الداخلية بطمأنينة / مثل أيقونات القفل التي ترمز الى تفاعل آمن عبر صفحات الإنترنت

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

الثقة في الحكومة

40. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً).

أظن أنني يمكنني الثقة في الهيئات الحكومية / أثق في نزاهة الهيئة وقدرتها على تقديم الخدمة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

يمكن الوثوق في الهيئات الحكومية لإجراء معاملات عبر الإنترنت بثقة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أثق في أن الهيئات الحكومية تُراعي تحقيق مصالحي على أفضل وجه

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

الهيئات الحكومية في رأيي، جديرة بالثقة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

قابلية الثقة: قابلية الثقة أو عدم الثقة في الآخرين

41. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً).

لا أثق في الآخرين بوجه عام

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

لدي ثقة في البَشَر بوجه عام

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

اشعر بأن الناس عموماً جديرون بالثقة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أثق عموماً في الأشخاص الآخرين ما لم يظهر منهم ما يمنعني من الثقة بهم

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

نهاية الأسئلة

شكراً جزيلاً على وقتكم الثمين وتعاونكم وسعة صدركم في إكمال هذا الإستبيان. إذا كانت لديكم أيّ أسئلة أو تعليقات أو اقتراحات أو إذا اردتم الإطّلاع على نتائج هذا البحث، يُرجى عدم التردد في الإتصال بنا على

المشرف: البروفسور جيوتي جاودري استاذ نظم المعلومات جامعة هيرتفوردشاير كلية إدارة الأعمال وحدة أبحاث إدارة النظام (SyMRU) DeHavilland campus Hatfield Herts AL10 9EU البريد الإلكتروني: j.choudrie@herts.ac.uk ، jyotichoudrie@gmail.com الهاتف: +441707281271	الباحث: عادل الفلاح طالب دكتوراه في جامعة هيرتفوردشاير كلية إدارة الأعمال العنوان البريدي: 6 Lisa Court, Frank's Lane، Cambridge، Cambridgeshire CB4 1SW البريد الإلكتروني: aas131@hotmail.com الهاتف الجوال: 447908223353+ / 966532094651+

Appendix 4-2 Pilot Study Analysis

Demographic Variables

Employment Status		
Intervals	**Frequency**	**Percent**
Pensioner 65+	47	18.3
Retired (under 65 years old)	38	14.8
Employed full time	56	21.8
Employed part time	12	4.7
Self-employed	16	6.2
Own my own business	15	5.8
Unemployed (for medical reasons)	8	3.1
Unemployed (for more than 6 months)	65	25.3
Total	257	100

Occupation		
Intervals	**Frequency**	**Percent**

Academic/Teacher	30	11.7
Agricultural/Forestry/Fishery	23	8.9
Public Sector Employee	68	26.5
Craft/Trade	29	11.3
Freelance	24	9.3
Legislator/Manager	11	4.3
Plant/Machine Operator	6	2.3
Services/sales	17	6.6
Officer	17	6.6
Housewife	32	12.5
Total	257	100

Health Status		
Intervals	**Frequency**	**Percent**
Excellent	53	20.6
Good	127	49.4
Poor	77	30
Total	257	100

Internet Adoption Status		
Intervals	**Frequency**	**Percent**

Adopters	195	75.9
Non-Adopters	60	23.3
Planning to Adopt	2	0.8
Total	257	100

Computer Experience – Internet Adopters only		
Intervals	**Frequency**	**Percent**
I am a user with little knowledge and experience	125	63.45
I have no knowledge or experience of computers	15	7.61
I am a user with a lot of knowledge and experience	57	28.93

Internet Use Frequency – Internet Adopters only		
Intervals	**Frequency**	**Percent**
Several times a day (every hour)	8	4.06
Several times a day (not every hour)	19	9.64
Daily	98	49.75
Several times a week (three times a week)	42	21.32
Several times a week (Less than three times)	8	4.06
Weekly	20	10.15
Monthly	2	1.02

Internet Activities

Intervals	Frequency	Percent
To book appointments	24	12.18
Searching Google for information	97	49.24
For banking	48	24.37
For paying bills	38	19.29
For work purposes	11	5.58
For communication (e.g. emails)	29	14.72
For leisure	20	10.15
For general reading	68	34.52
For travel purposes	13	6.60
For entertainment purposes	60	30.46
For seeking health care information	26	13.20
For interacting with government agencies	14	7.11
For online shopping	19	9.64

Reasons for not accessing the Internet (n=42)		
Intervals	**Frequency**	**Percent**
Just not interested	6	14.29
I do not have the skills	20	47.62
I do not feel comfortable...	4	9.52
Too old to learn	32	76.19
I am too busy	1	2.38
Due to illnesses	4	9.52

Reasons for not planning to have an Internet connection at home (n=19)

Intervals	Frequency	Percent
I am not interested	4	21.05
I do not have the skills	7	36.84
Too old to learn	17	89.47
I am too busy	5.26	1
Other reasons	5.26	1

Ailments Due to Old Age		
Intervals	**Frequency**	**Percent**
Alzheimer's Disease	2	0.77
Arthritis	38	14.67
Balance Disorders	15	5.79
Cancer	2	0.77
Eye Diseases	45	17.37
Ear Disorders	16	6.18
Diabetes	40	15.44
Falls & Mobility Problems	17	6.56
Generalized Anxiety Disorder	10	3.86
Heart Disease	26	10.04
High Blood Pressure	40	15.44
High Cholesterol	29	11.20
Hip Fracture	7	2.70
Neck Fracture	1	0.39
Parkinson’s Disease	4	1.54
Stroke	9	3.47
Nothing from the above	50	19.31
Other aging disease(s)	55	21.24

Ailments Affect Internet Use

Intervals	Frequency	Percent
Vision Impairments	42	21.54
Arthritis of the Hand	8	4.10
Arthritis of the Fingers	10	5.13
Alzheimer's Disease	2	1.03
Balance Disorders	4	2.05
Ear Disorders	3	1.54
Diabetes	11	5.64
Falls & Mobility Problems	3	1.54
Generalized Anxiety Disorder	3	1.54
Heart Disease	11	5.64
High Blood Pressure	6	3.08
Memory Loss	2	1.03
Neck Fracture	9	4.62
Nothing from the above	82	42.05
Other Diseases	25	12.82

Tablet Adoption Status		
Intervals	**Frequency**	**Percent**
Adopters	56	28.43
Non-Adopters	96	48.73
Planning to become Adopters	45	22.84

Tablet Experience – Tablets Adopters only

Intervals	Frequency	Percent
Less than 6 months	6	10.71
6 months to 1 year	9	16.07
1 year to 2 years	18	32.14
2 years to 3 years	14	25.00
Over 3 years	9	16.07

Tablet Network Provider– Tablets Adopters only		
Intervals	**Frequency**	**Percent**
Saudi Telecommunication Company (STC)	28	50.00
Mobily	24	42.86
Zeen	9	16.07

Tablet Subscription		
Intervals	**Frequency**	**Percent**
Pay as you go	38	67.86
Pay on a monthly basis (Contract)	17	30.36
Other	1	1.79

Tablet Use Frequency – Internet Adopters only

Intervals	Frequency	Percent
More than once a day	17	30.36
Once a day	16	28.57
Weekly	4	7.14
I only use it when I need to	16	28.57
I rarely use it	3	5.36

Consideration(s) when buying a tablet device		
Intervals	**Frequency**	**Percent**
Appearance (such as colour or material)	15	33.33
Brand (such as Apple & Samsung)	27	60.00
Price of the tablet	36	80.00
Camera capabilities	7	15.56
Operating System (Such as iOS & Android)	1	2.22
Operating Speed	2	4.44
Screen Size	33	73.33
Screen Resolution	3	6.67
Weight	14	31.11
Battery life	1	2.22
Memory size	1	2.22
Quality of Applications (apps)	1	2.22
Price of Applications (apps)	1	2.22

Pilot Data Analysis
Structural Model Analysis

Factor Loadings (All Participants)

	Com	COMP	DTT	IM	PCR	PI	PR	PWA	RA	TOG	TOI	UI

COM1	**0.9788**	0.9268	0.4763	0.0547	-0.564	0.7363	0.7448	0.9176	0.9398	0.5257	0.8003	0.9204
COM2	**0.9833**	0.9371	0.4355	0.102	-0.5708	0.7573	0.7259	0.9297	0.9539	0.5178	0.8031	0.9242
COM3	**0.977**	0.9188	0.4616	0.0892	-0.5794	0.7448	0.7305	0.9251	0.953	0.5315	0.8097	0.9197
COM4	**0.8991**	0.8361	0.4103	0.0077	-0.5287	0.7096	0.6452	0.805	0.8417	0.5168	0.6877	0.7926
COMP1	0.9225	**0.9723**	0.4193	0.1201	-0.552	0.7314	0.7069	0.9107	0.9331	0.4918	0.8003	0.9076
COMP2	0.9312	**0.9799**	0.4028	0.0671	-0.5287	0.7337	0.6908	0.9125	0.9345	0.4834	0.7867	0.8922
COMP3	0.9094	**0.9697**	0.4143	0.06	-0.5325	0.7372	0.6912	0.9062	0.9209	0.4734	0.7917	0.8934
COMP4	0.9022	**0.9552**	0.468	0.0504	-0.5762	0.7131	0.7033	0.8903	0.9025	0.5163	0.7716	0.8832
COMP5	0.8658	**0.9272**	0.3681	0.0724	-0.4905	0.6773	0.663	0.8188	0.8638	0.4512	0.6841	0.8274
DTT1	0.4689	0.4461	**0.8275**	-0.0609	-0.368	0.3088	0.5597	0.4864	0.4599	0.5329	0.5333	0.5087
DTT2	0.3971	0.3481	**0.9177**	-0.124	-0.3455	0.3552	0.4743	0.4294	0.4199	0.5664	0.5055	0.437
DTT3	0.3936	0.3559	**0.9391**	-0.1625	-0.3728	0.3288	0.4843	0.4348	0.4071	0.5967	0.5153	0.4318
DTT4	0.4142	0.4036	**0.9095**	-0.1553	-0.3228	0.3116	0.5073	0.4264	0.4259	0.6001	0.5155	0.4656
IM1	0.0661	0.0743	-0.0994	**0.9035**	-0.2056	-0.0369	0.0616	0.0814	0.0748	-0.0909	0.0782	0.0441
IM2	0.0645	0.0537	-0.15	**0.9073**	-0.2004	-0.0624	0.0414	0.0713	0.0607	-0.1093	0.041	0.0241
IM3	0.0722	0.0415	-0.0239	**0.8306**	-0.2089	-0.0559	0.0758	0.0935	0.0694	-0.0345	0.0654	0.0458
IM4	-0.0452	-0.0871	0.1435	***-0.603****	0.0928	-0.0128	0.0404	-0.0467	-0.0714	0.1247	-0.0426	-0.0635
IM5	0.0411	0.0478	-0.1452	**0.8956**	-0.1219	-0.0591	0.0142	0.0696	0.0516	-0.1342	0.0637	0.063
PCR1	-0.5358	-0.514	-0.395	-0.2149	**0.9609**	-0.4136	-0.652	-0.5496	-0.5377	-0.3571	-0.6046	-0.5375
PCR2	-0.5941	-0.5599	-0.4014	-0.1626	**0.9801**	-0.4752	-0.7187	-0.599	-0.5844	-0.3996	-0.6472	-0.6046
PCR3	-0.584	-0.5625	-0.3766	-0.1561	**0.9782**	-0.4539	-0.682	-0.5886	-0.5661	-0.3883	-0.6243	-0.5797
PCR4	-0.5587	-0.5352	-0.3516	-0.2131	**0.9764**	-0.4291	-0.6548	-0.564	-0.5406	-0.3919	-0.6106	-0.5491
PI1	0.759	0.7414	0.35	-0.0409	-0.4551	**0.9921**	0.6053	0.7744	0.7676	0.4697	0.6474	0.7519
PI2	0.7584	0.7371	0.3683	-0.0521	-0.4525	**0.9946**	0.611	0.7728	0.7678	0.4739	0.6555	0.7544
PI3	0.7688	0.7503	0.3621	-0.0389	-0.4504	**0.9928**	0.6149	0.784	0.7799	0.4756	0.6619	0.7654
PR1	0.7198	0.6895	0.5453	0.007	-0.6812	0.5997	**0.9915**	0.7269	0.7261	0.5389	0.7845	0.7613
PR2	0.7522	0.7363	0.5707	0.0485	-0.6992	0.6191	**0.9921**	0.7666	0.7603	0.5557	0.8093	0.7967
PWA1	0.8248	0.8021	0.4744	0.0545	-0.5762	0.7316	0.6856	**0.8862**	0.8364	0.5415	0.8062	0.8432
PWA10	0.9137	0.893	0.4966	0.0627	-0.5775	0.7365	0.7334	**0.9569**	0.9242	0.5253	0.8142	0.9006
PWA11	0.906	0.8884	0.4868	0.0181	-0.58	0.7866	0.7319	**0.9365**	0.9196	0.5536	0.8159	0.9274
PWA2	0.9055	0.909	0.4057	0.1003	-0.5537	0.7511	0.6946	**0.9458**	0.9241	0.4874	0.8069	0.8932
PWA3	0.8951	0.8839	0.504	0.0713	-0.5497	0.7339	0.7075	**0.952**	0.9142	0.5549	0.8373	0.8926
PWA4	0.8934	0.9002	0.4519	0.1009	-0.5604	0.7321	0.712	**0.9627**	0.918	0.5207	0.8131	0.8897
PWA5	0.798	0.7959	0.4503	0.1029	-0.5241	0.6908	0.7058	**0.8986**	0.827	0.4626	0.7703	0.8232
PWA6	0.7233	0.7157	0.4568	0.0556	-0.4935	0.6425	0.6556	**0.8158**	0.7415	0.4728	0.7244	0.744
PWA7	0.8193	0.8205	0.39	0.0778	-0.4843	0.6779	0.6395	**0.8974**	0.8319	0.451	0.7305	0.7991
PWA8	0.855	0.8539	0.4062	0.1468	-0.52	0.7004	0.6541	**0.9222**	0.8707	0.4704	0.7534	0.8325
PWA9	0.9116	0.8952	0.4821	0.0973	-0.5713	0.7427	0.717	**0.9612**	0.9225	0.5168	0.8139	0.8968
RA1	0.9367	0.9261	0.4724	0.0647	-0.5705	0.7711	0.7573	0.9329	**0.9767**	0.5239	0.8388	0.9254
RA2	0.9334	0.9172	0.4409	0.096	-0.5651	0.7869	0.7282	0.9261	**0.9715**	0.5076	0.8392	0.91
RA3	0.842	0.8341	0.4785	-0.0388	-0.4858	0.6643	0.6552	0.8239	**0.8756**	0.5183	0.7036	0.804
RA4	0.9465	0.9263	0.4314	0.1002	-0.5423	0.7478	0.7217	0.9266	**0.9764**	0.5004	0.816	0.9255
RA5	0.9214	0.9126	0.4506	0.1508	-0.5626	0.7282	0.7067	0.9199	**0.9616**	0.4951	0.818	0.9005
TOG1	0.5305	0.4935	0.6066	-0.1	-0.3911	0.4348	0.5404	0.5373	0.5227	**0.9627**	0.5763	0.5612
TOG2	0.533	0.4798	0.6353	-0.1127	-0.4076	0.4714	0.5514	0.5381	0.5232	**0.9474**	0.5836	0.5628
TOG3	0.4732	0.4485	0.5717	-0.1295	-0.2912	0.4418	0.4635	0.4697	0.4588	**0.9125**	0.517	0.4931
TOG4	0.5161	0.478	0.5991	-0.1379	-0.3952	0.4522	0.5256	0.5245	0.507	**0.9563**	0.5482	0.5341
TOI1	0.7932	0.7877	0.5703	0.0862	-0.6166	0.6374	0.7943	0.8414	0.8308	0.5623	**0.9803**	0.8629
TOI2	0.8017	0.7963	0.5414	0.083	-0.6232	0.6473	0.7888	0.8449	0.8389	0.5699	**0.9817**	0.8691
TOI3	0.7723	0.753	0.5718	0.0429	-0.6294	0.6448	0.7678	0.8206	0.7994	0.5935	**0.9632**	0.8252
UI1	0.9262	0.9058	0.4956	0.0619	-0.607	0.7368	0.7754	0.9234	0.9286	0.556	0.8605	**0.9831**
UI2	0.9227	0.913	0.4924	0.061	-0.5836	0.7648	0.7748	0.9207	0.9321	0.5543	0.8631	**0.9923**
UI3	0.9248	0.9162	0.4924	0.0758	-0.5624	0.7574	0.759	0.9221	0.9324	0.5541	0.8477	**0.9908**
UI4	0.8816	0.8763	0.5372	0.0568	-0.5467	0.7442	0.7856	0.9073	0.9017	0.5818	0.8724	**0.9722**

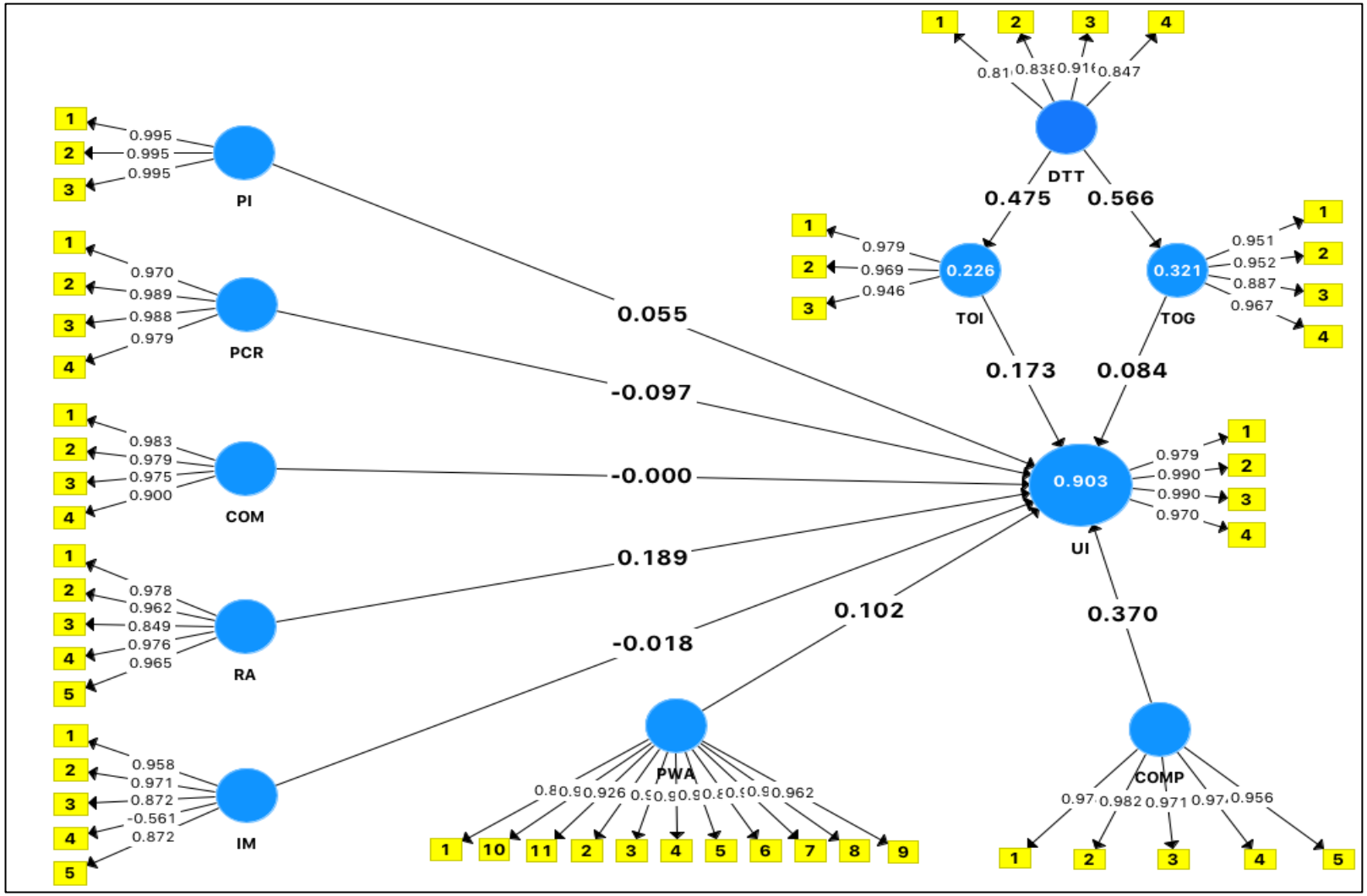
Pilot Sub-groups Analysis
50-59 Participants

Table. AVE, Composite Reliability & Cronbach's Alpah (Pilot 50-59)

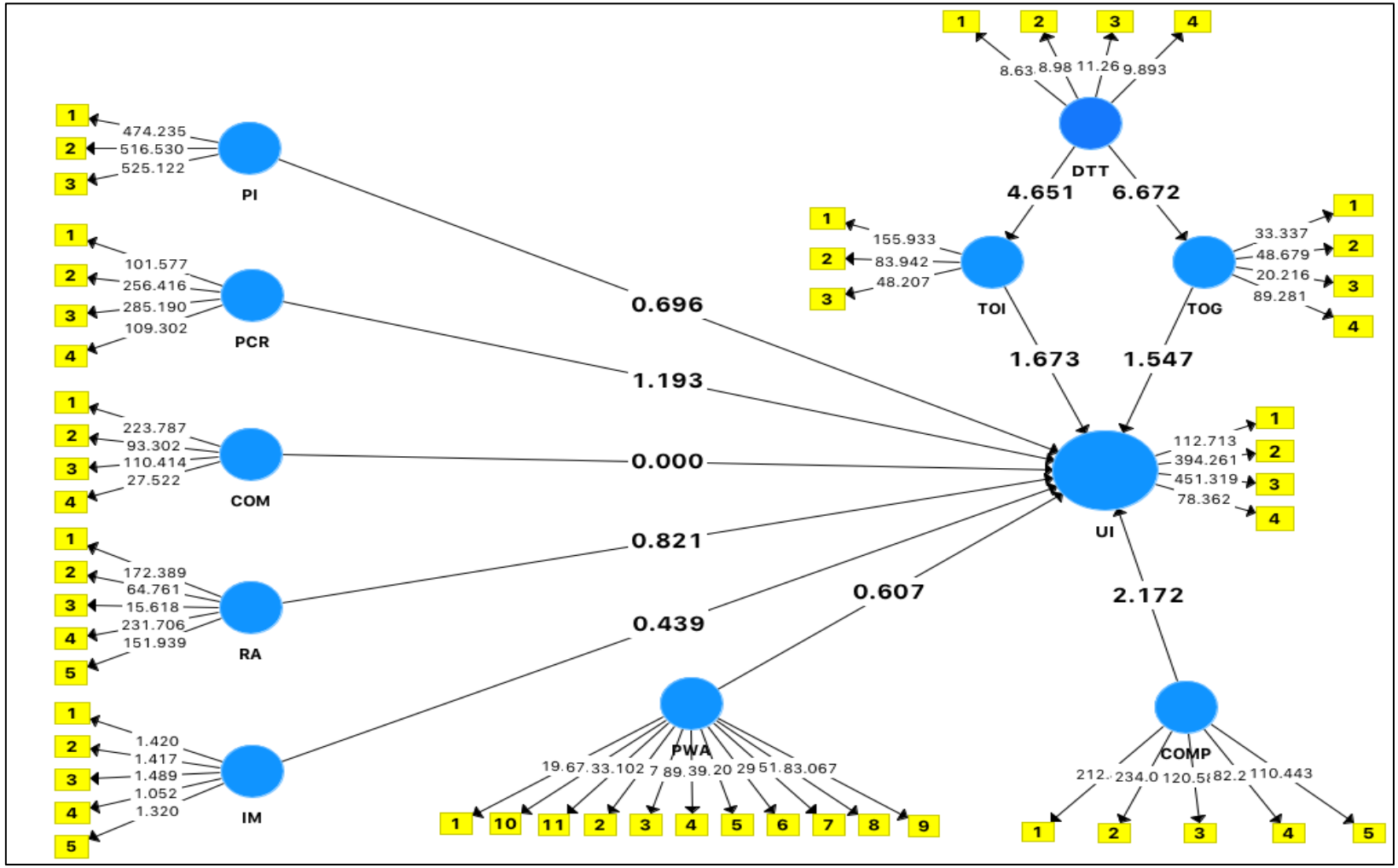
Construct	Cronbach's Alpha	Composite Reliability	AVE
Compatibility (COM)	0.971	0.979	0.921
Complexity (COMP)	0.986	0.989	0.946
Disposition To Trust (DTT)	0.877	0.916	0.731
Image (IM)	0.711	0.881	0.739
Perceived Cyber Risk (PCR)	0.987	0.991	0.964
Primary Influence (PI)	0.995	0.997	0.990
Perceived Website Assistance (PWA)	0.983	0.985	0.856
Relative Advantage (RA)	0.971	0.978	0.897
Trust of Government (TOG)	0.956	0.968	0.883
Trust of Internet (TOI)	0.962	0.976	0.930
Use Intention (UI)	0.988	0.991	0.965

Table. Construct Cross-Correlation Matrix and AVE analysis - Diagonal numbers (in parentheses) are the square root of the AVE (Pilot 50-59)

	COMP	Com	DTT	IM	PCR	PI	PWA	RA	TOG	TOI	UI
COMP	0.960										
Com	0.950	0.972									
DTT	0.419	0.369	0.855								
IM	0.138	0.137	-0.077	0.860							
PCR	-0.671	-0.622	-0.413	-0.325	0.982						
PI	0.712	0.677	0.241	-0.014	-0.532	0.995					
PWA	0.922	0.932	0.398	0.152	-0.652	0.727	0.925				
RA	0.959	0.961	0.367	0.142	-0.652	0.732	0.952	0.947			
TOG	0.508	0.429	0.566	-0.099	-0.313	0.364	0.451	0.424	0.940		
TOI	0.819	0.832	0.475	0.204	-0.692	0.624	0.866	0.838	0.502	0.965	
UI	0.912	0.921	0.407	0.133	-0.685	0.708	0.914	0.922	0.507	0.867	0.982



Path Analysis (Pilot 50-59)



Bootstrapping Analysis (Pilot 50-59)

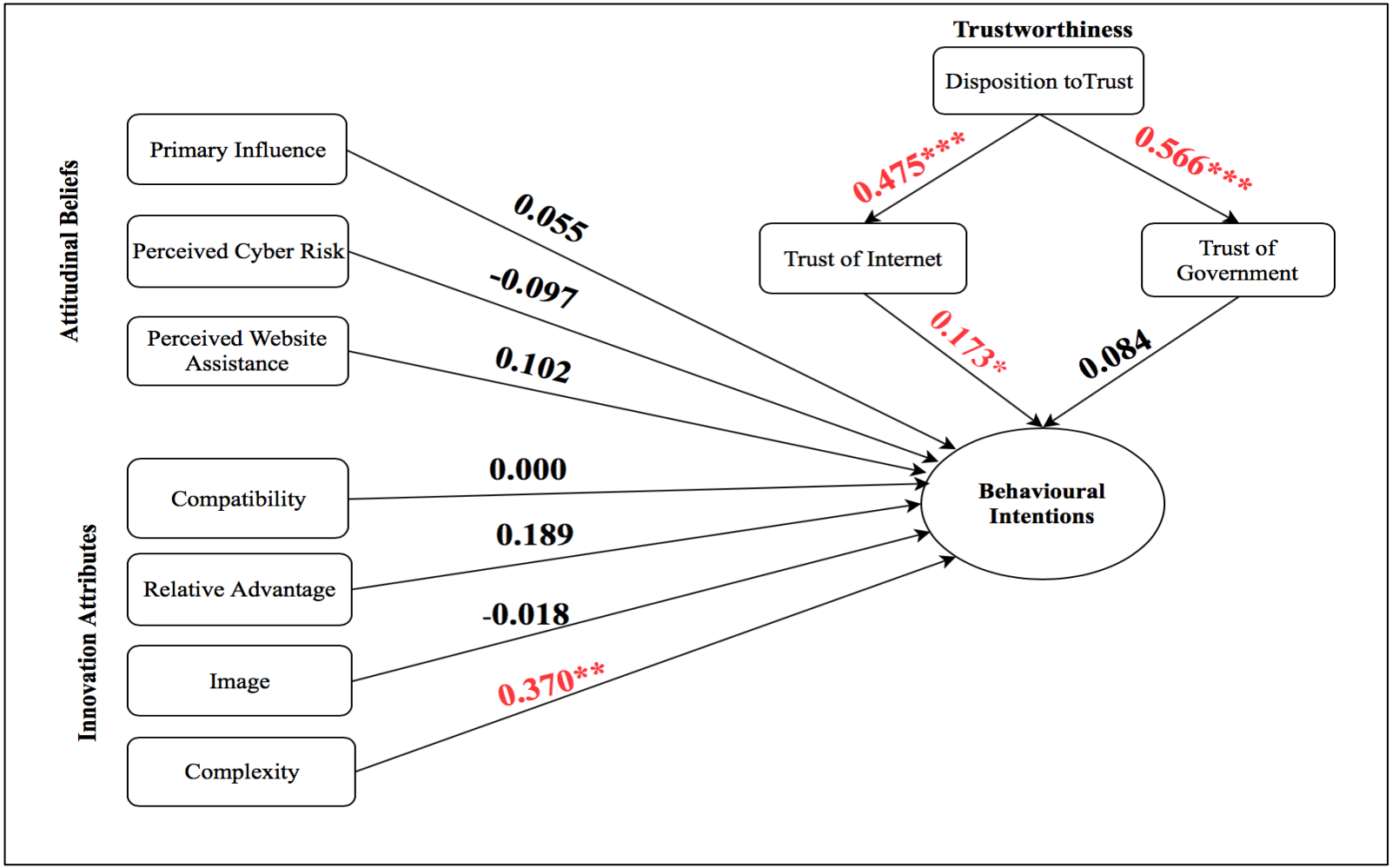


Figure 4. Structural model evaluation (pilot 50-59)
*Significant at 0.1 level
**Significant at 0.05 level
***Significant at 0.01 level

Table. Hypothesis testing – Pilot (50-59)

	Construct	Coefficient	*t*-value	p-value	Significance	Support
H1	Primary Influence -> UI	0.055	0.696	0.487		**No**
H2	Perceived Cyber Risk -> UI	-0.097	1.193	0.234		**No**
H3	Perceived Website Assistance -> UI	0.102	0.607	0.544		**No**
H4	Compatibility -> UI	0.000	0.000	1.000		**No**
H5	Relative advantage -> UI	0.189	0.821	0.412		**No**
H6	Image -> UI	-0.018	0.439	0.661		**No**
H7	Complexity -> UI	0.370	2.172	0.030	**+	Yes
H8	Disposition to trust -> TOI	0.475	4.651	0.000	***+	Yes
H9	Disposition to trust -> TOG	0.566	6.672	0.000	***+	Yes
H10	Trust of the Internet -> UI	0.173	1.673	0.095	*+	Yes
H11	Trust of the government -> UI	0.084	1.547	0.123		**No**

R^2 = 903

P* <0.1 P** <0.05 P*** <0.01

\+ Positive effect

\- Negative effect

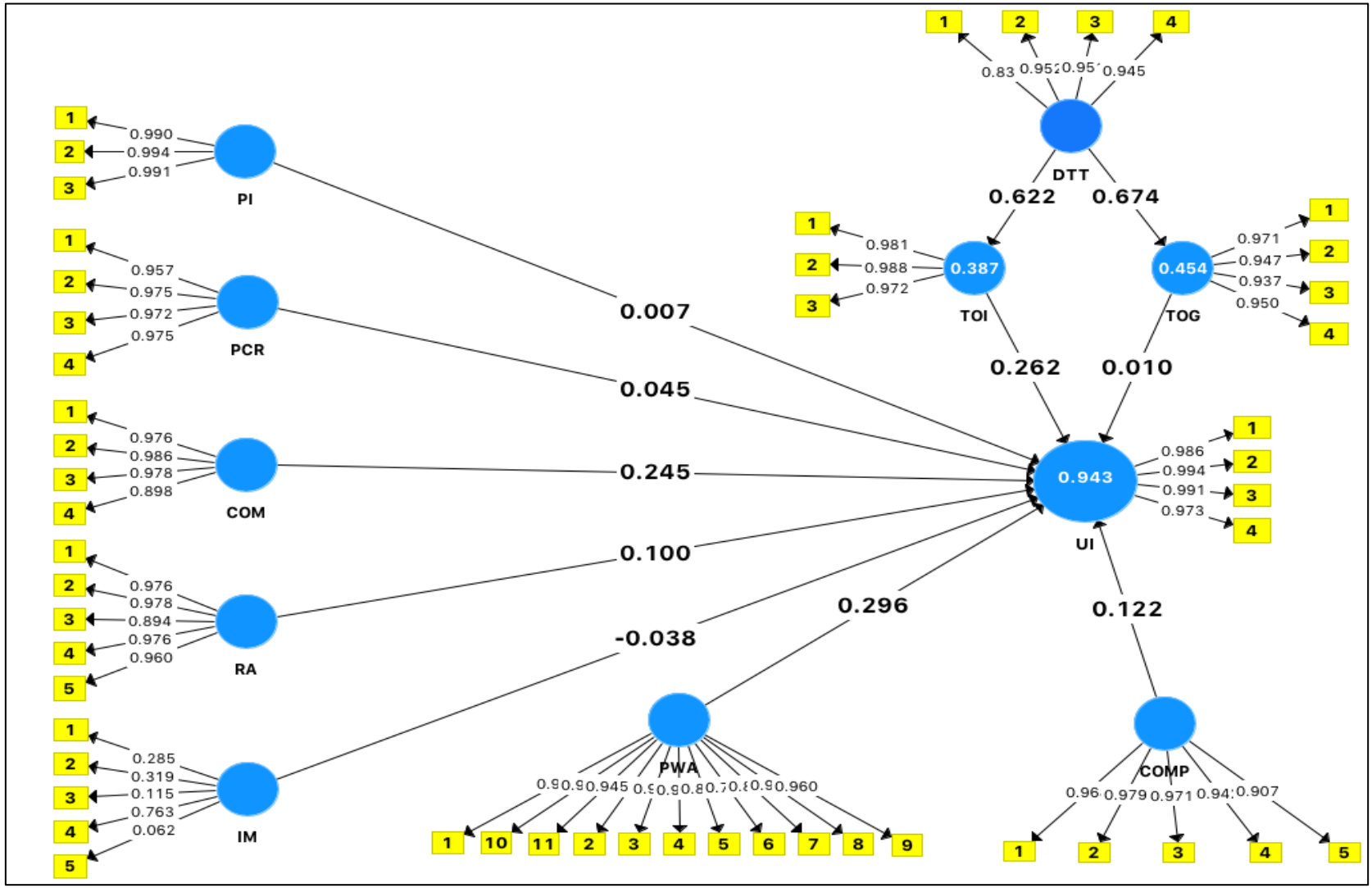
Pilot Sub-groups Analysis
60+ Participants

Table. AVE, Composite Reliability & Cronbach's Alpah (Pilot 60+)

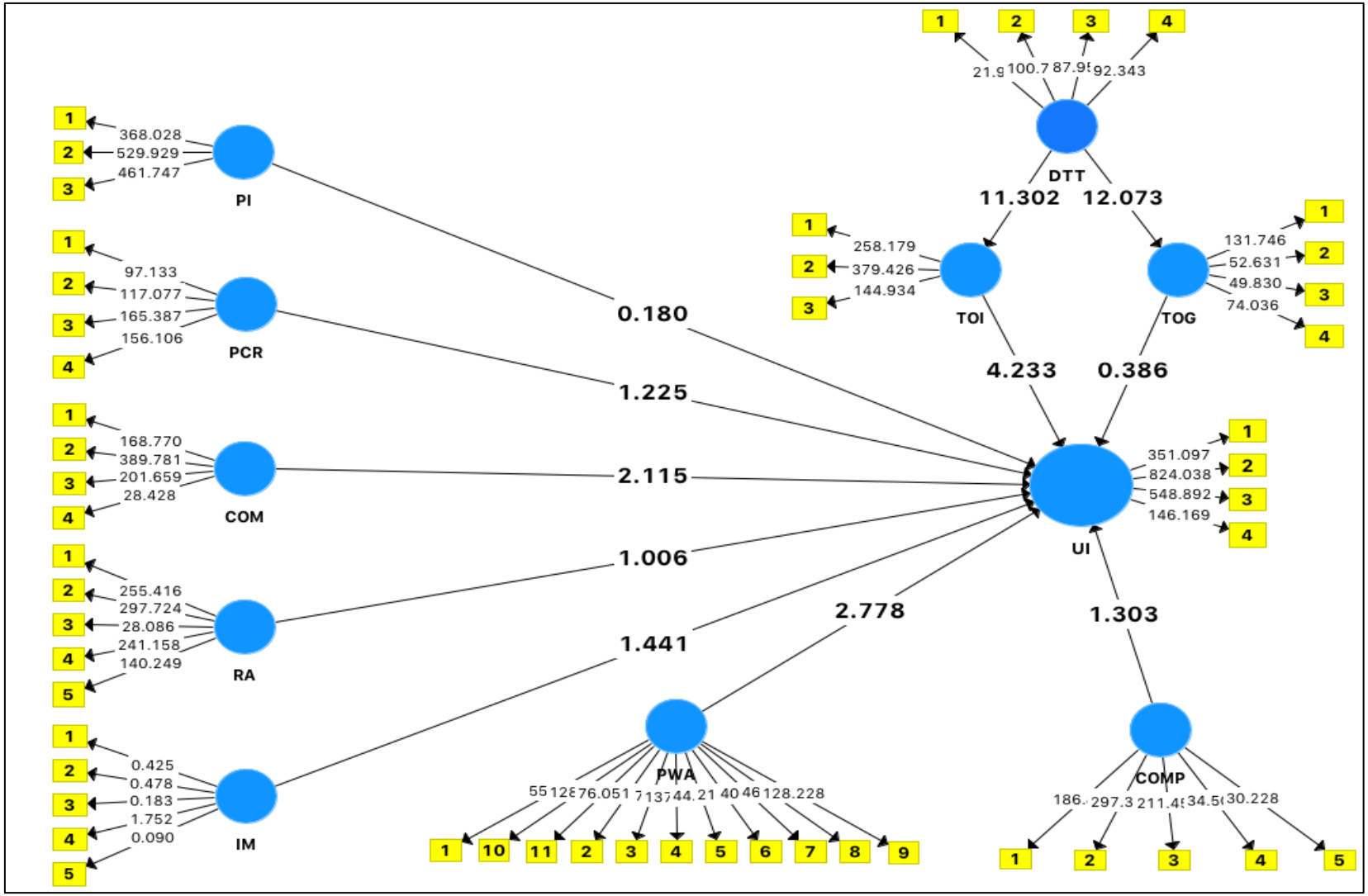
Construct	Cronbach's Alpha	Composite Reliability	AVE
Compatibility (COM)	0.971	0.979	0.922
Complexity (COMP)	0.975	0.981	0.910
Disposition To Trust (DTT)	0.939	0.957	0.849
Image (IM)	0.776	**0.361**	**0.156**
Perceived Cyber Risk (PCR)	0.979	0.984	0.941
Primary Influence (PI)	0.992	0.995	0.984
Perceived Website Assistance (PWA)	0.982	0.984	0.848
Relative Advantage (RA)	0.977	0.982	0.917
Trust of Government (TOG)	0.965	0.974	0.905
Trust of Internet (TOI)	0.980	0.987	0.961
Use Intention (UI)	0.990	0.993	0.972

Table. Construct Cross-Correlation Matrix and AVE analysis - Diagonal numbers (in parentheses) are the square root of the AVE (Pilot 60+)

	COMP	Com	DTT	IM	PCR	PI	PWA	RA	TOG	TOI	UI
COMP	0.960										
Com	0.942	0.954									
DTT	0.494	0.471	0.921								
IM	-0.068	-0.094	0.044	0.395							
PCR	-0.548	-0.528	-0.390	-0.035	0.970						
PI	0.798	0.791	0.421	-0.078	-0.422	0.992					
PWA	0.944	0.919	0.558	-0.068	-0.560	0.820	0.921				
RA	0.967	0.940	0.533	-0.077	-0.535	0.803	0.952	0.958			
TOG	0.572	0.549	0.674	0.043	-0.452	0.541	0.614	0.598	0.951		
TOI	0.822	0.787	0.622	-0.044	-0.619	0.686	0.864	0.854	0.631	0.980	
UI	0.941	0.916	0.563	-0.108	-0.541	0.792	0.951	0.948	0.606	0.886	0.986



Path Analysis (Pilot 60+)



Bootstrapping Analysis (Pilot 60+)

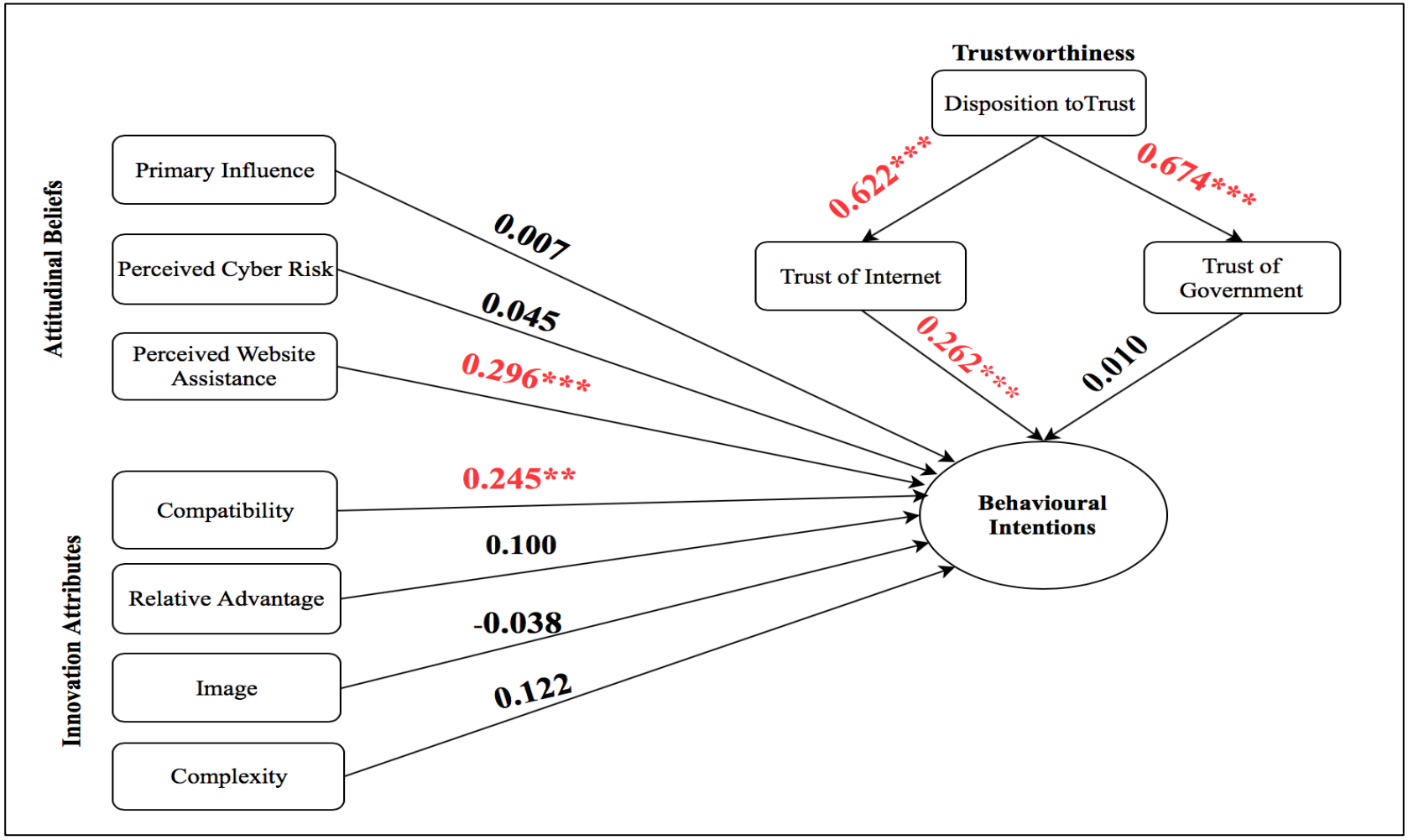


Figure 4. Structural model evaluation (pilot 60+)

*Significant at 0.1 level
**Significant at 0.05 level
***Significant at 0.01 level

Table. Hypothesis testing – Pilot (60+)

	Construct	Coefficient	*t*-value	p-value	Significance	Support
H1	Primary Influence -> UI	0.007	0.180	0.857		**No**
H2	Perceived Cyber Risk -> UI	0.045	1.225	0.221		**No**
H3	Perceived Website Assistance -> UI	0.296	2.778	0.006	***+	Yes
H4	Compatibility -> UI	0.245	2.115	0.035	**+	Yes
H5	Relative advantage -> UI	0.100	1.006	0.315		**No**
H6	Image -> UI	-0.038	1.441	0.150		**No**
H7	Complexity -> UI	0.122	1.303	0.193		**No**
H8	Disposition to trust -> TOI	0.622	11.302	0.000	***+	Yes
H9	Disposition to trust -> TOG	0.674	12.073	0.000	***+	Yes
H10	Trust of the Internet -> UI	0.262	4.233	0.000	***+	Yes
H11	Trust of the government -> UI	0.010	0.386	0.700		**No**

R^2 = 943

P* <0.1 P** <0.05 P*** <0.01
+ Positive effect
- Negative effect

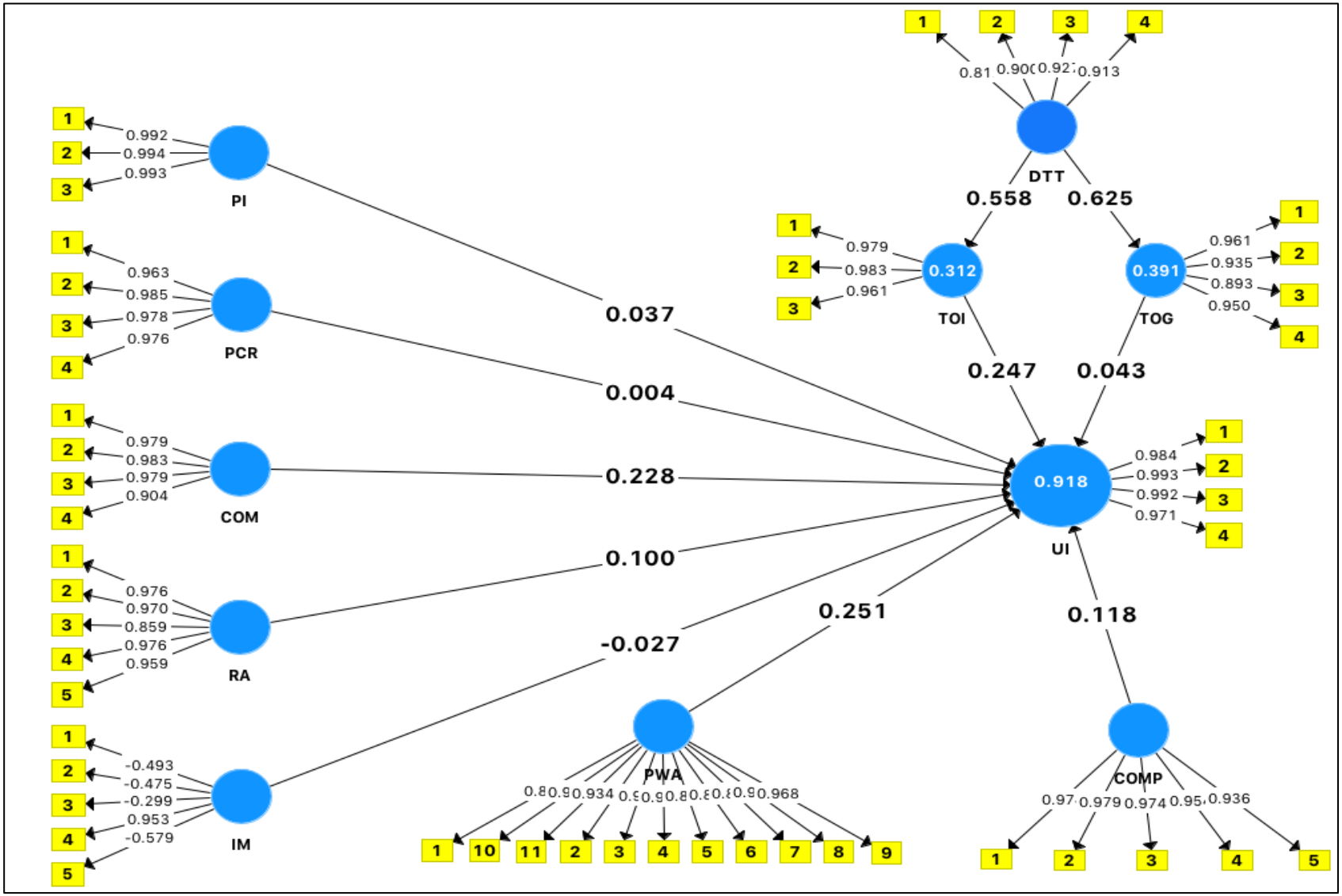
Pilot Sub-groups Analysis
Male Participants

Table. AVE, Composite Reliability & Cronbach's Alpah (Pilot Male Participants)

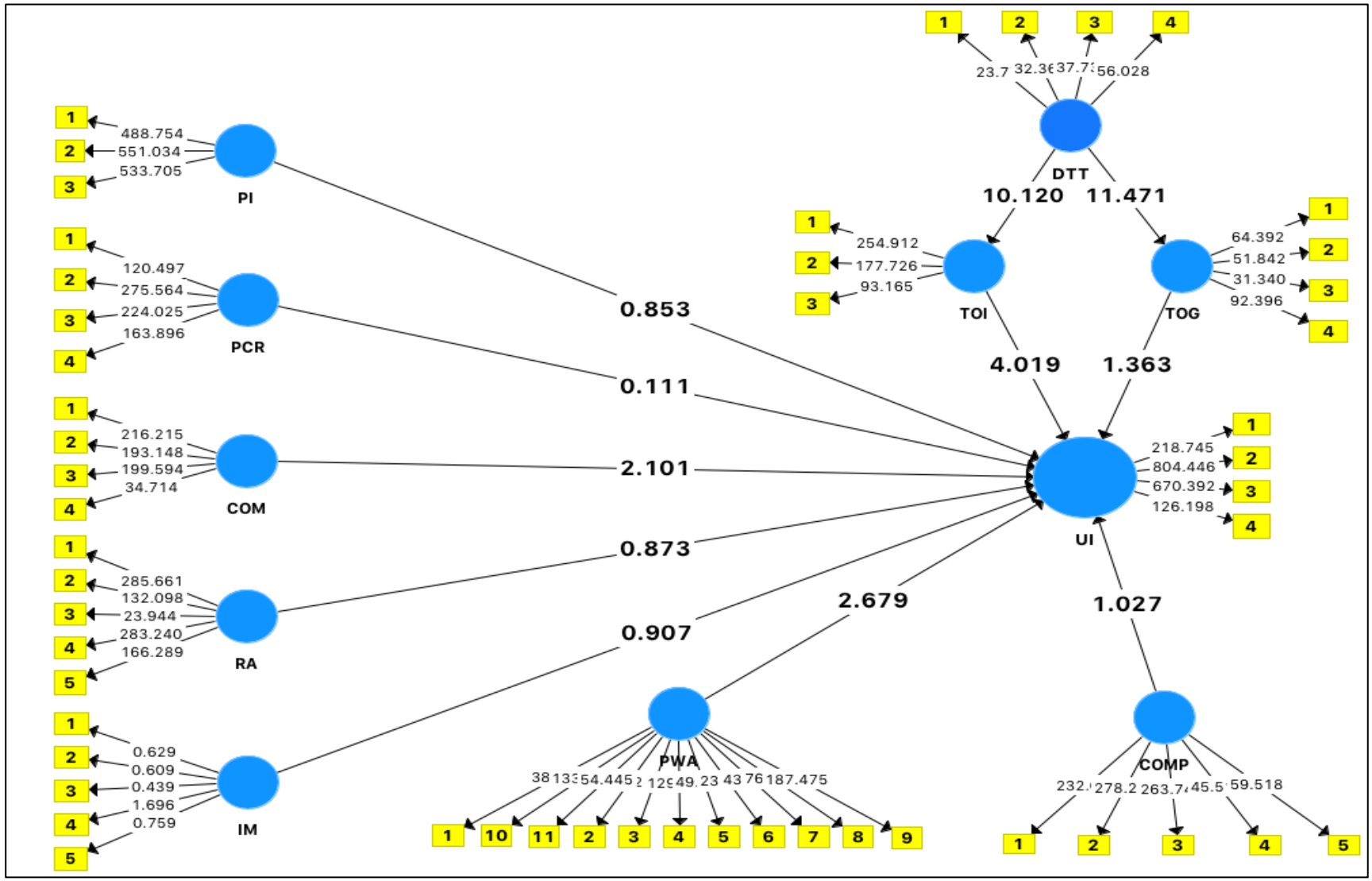
Construct	Cronbach's Alpha	Composite Reliability	AVE
Compatibility (COM)	0.972	0.980	0.925
Complexity (COMP)	0.981	0.985	0.928
Disposition To Trust (DTT)	0.911	0.938	0.791
Image (IM)	0.730	**0.199**	**0.360**
Perceived Cyber Risk (PCR)	0.983	0.988	0.952
Primary Influence (PI)	0.993	0.995	0.986
Perceived Website Assistance (PWA)	0.982	0.984	0.849
Relative Advantage (RA)	0.972	0.978	0.901
Trust of Government (TOG)	0.952	0.965	0.875
Trust of Internet (TOI)	0.973	0.983	0.950
Use Intention (UI)	0.990	0.992	0.970

Table. Construct Cross-Correlation Matrix and AVE analysis - Diagonal numbers (in parentheses) are the square root of the AVE (Pilot Male Participants)

	COM	COMP	DTT	IM	PCR	PI	PWA	RA	TOG	TOI	UI
COM	0.962										
COMP	0.942	0.964									
DTT	0.456	0.431	0.889								
IM	-0.080	-0.145	0.150	0.600							
PCR	-0.577	-0.550	-0.429	0.092	0.976						
PI	0.746	0.720	0.406	-0.038	-0.451	0.993					
PWA	0.934	0.925	0.490	-0.099	-0.594	0.764	0.922				
RA	0.967	0.949	0.472	-0.116	-0.573	0.748	0.948	0.949			
TOG	0.549	0.525	0.625	0.112	-0.469	0.530	0.549	0.539	0.935		
TOI	0.815	0.816	0.558	-0.079	-0.644	0.658	0.864	0.841	0.591	0.974	
UI	0.924	0.914	0.505	-0.115	-0.598	0.744	0.934	0.931	0.583	0.880	0.985



Path Analysis (Pilot Male Participants)



Bootstrapping Analysis (Pilot Male Participants)

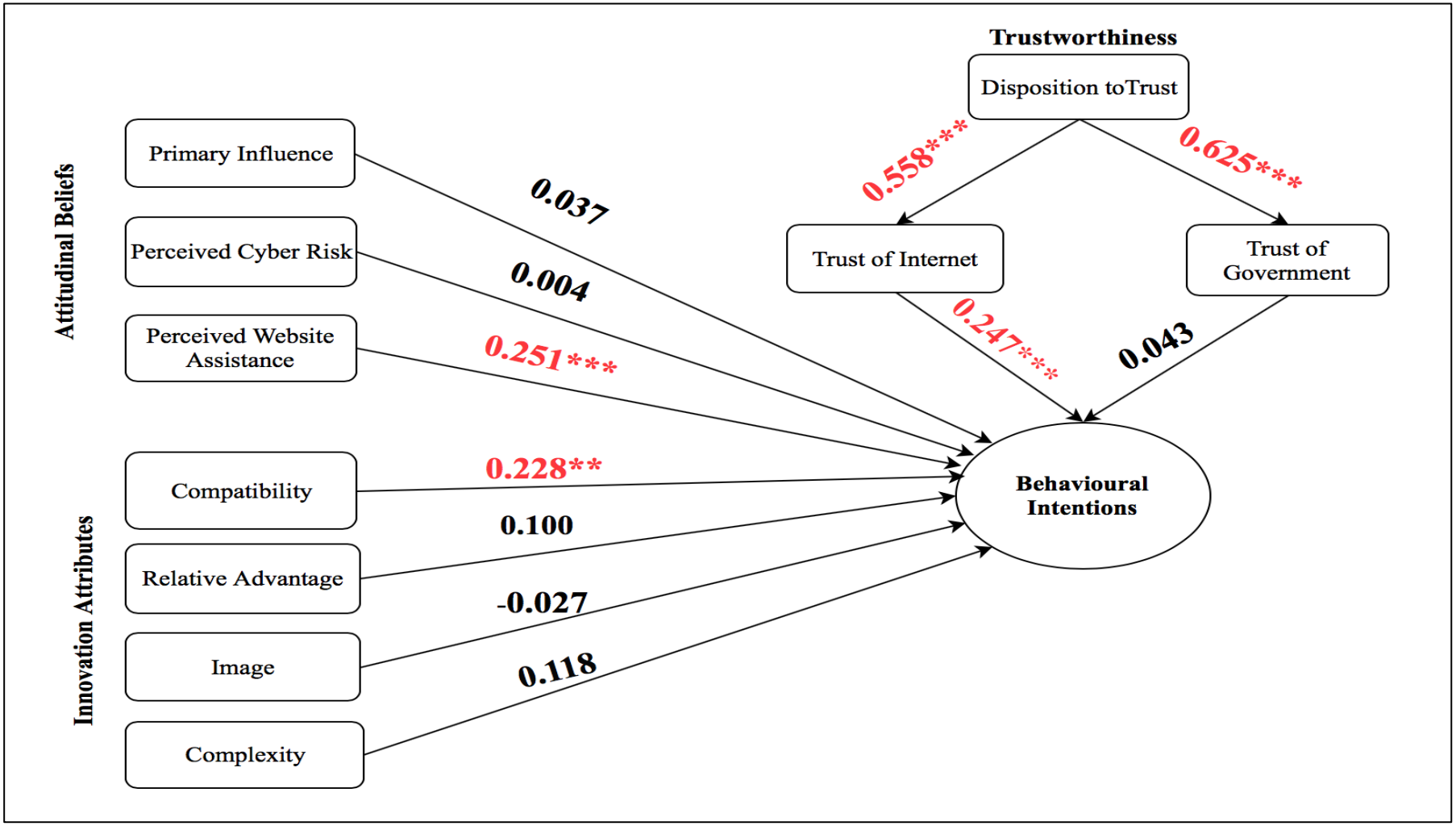


Figure 4. Structural model evaluation (Pilot Male Participants)

*Significant at 0.1 level

**Significant at 0.05 level

***Significant at 0.01 level

Table. Hypothesis testing – Pilot (Male Participants)

	Construct	Coefficient	*t*-value	p-value	Significance	Support
H1	Primary Influence -> UI	0.037	0.853	0.394		**No**
H2	Perceived Cyber Risk -> UI	0.004	0.111	0.911		**No**
H3	Perceived Website Assistance -> UI	0.251	2.679	0.008	***+	Yes
H4	Compatibility -> UI	0.228	2.101	0.036	**+	Yes
H5	Relative advantage -> UI	0.100	0.873	0.383		**No**
H6	Image -> UI	-0.027	0.907	0.365		**No**
H7	Complexity -> UI	0.118	1.027	0.305		**No**
H8	Disposition to trust -> TOI	0.558	10.120	0.000	***+	Yes
H9	Disposition to trust -> TOG	0.625	11.471	0.000	***+	Yes
H10	Trust of the Internet -> UI	0.247	4.019	0.000	***+	Yes
H11	Trust of the government -> UI	0.043	1.363	0.174		**No**

R^2 = 918

P* <0.1 P** <0.05 P*** <0.01

\+ Positive effect

\- Negative effect

Appendix 5-1 Final Survey Questionnaire

Survey Title: Adoption and use of e-Government Services by Older Adults of Hail City

Dear Sir/Madam, We would like to seek your co-operation in completing this survey, which is an important research project being conducted at University of Hertfordshire's Management, Leadership and Organisation department; Social Sciences, Arts and Humanities Research Unit (SSAHRI); Hertfordshire Business school, Hertfordshire, UK. Presently, all countries around the globe are facing older populations. Alongside, new Information and Communication Technologies are being introduced, which governments are also providing and using. This means that not all the populations are using the technology, as some people may not be interested, some may not have the money, or the skills to use the Internet. The purpose of the study is to identify and explain the challenges existing for older adults when using e-Services in a developing country of the Middle East, in this case Saudi Arabia, Hail City. This survey focuses on services provided to citizens by The Ministry of Interior (MOI) electronic portal (e-Portal). MOI e-Portal can be accessed at www.moi.gov.sa. Conducting this study is very important because of the fact that such areas of research have not sufficiently been investigated in my country. I humbly wish that both citizens as well as government officials of my country benefit from this proposed study. For your information, this questionnaire includes a number of questions that should take approximately 30 minutes to complete. Please checkmark (tick) all appropriate answers. If your answer is not displayed, could you please kindly state your answer in the "Other" option category. You may omit any questions that you do not wish to answer. Please be assured that any information you provide will be used for academic research purposes only. Your survey response for this research will be identified using only a code. This work has been approved by the Ethics Committee of University of Hertfordshire under the protocol number: cBUS/PG/UH/00854. I would like to take this opportunity to thank you in advance for your time, patience and co-operation. Survey participants are welcome to seek information about the outcomes of this research project by emailing the supervisor and/or the researcher (contact details below).

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Section 1: Background Information

1. Please state the age group that you belong to?

50-59 60-69
70-79 80-89
Over 90

2. Please state your gender

Male
Female

3. Please state your highest level of education

Higher Degree/Postgraduate Degree (MBA PhD MD MA MSc)
1st Degree (BA / BSc)
College Diploma
Technical Certificate
Secondary School Certificate
Primary School Certificate
Can Read and Write Arabic
Illiterate
Other (please specify)

4. What is your current employment status?

Pensioner 65+
Employed full time
Self-employed
Unemployed (for less than 6 months)
Unemployed (for more than 6 months)
Student (full-time)
Retired (under 65 years old)
Employed part time
Own my own business
Unemployed (for medical reasons)
Student (part-time)

5. Please state your current occupation.
If you are of retired/pensioner status, please select the occupation you held for the majority of your working life.

Academic/Teacher
Agricultural/Forestry/Fishery
Clerk
Craft/Trade
Freelance
Legislator/Manager
Plant/Machine Operator
Services/sales
Student

Other (please specify)

6. Which of the following do you think best describes your state of health?
Excellent
Good
Poor

7. Could you please state the ailment(s) that you have incurred due to old age?
(You may choose more than one option)

Alzheimer's Disease
Arthritis
Balance Disorders
Cancer
Eye Diseases
Ear Disorders
Depression
Dementia
Diabetes
Falls & Mobility Problems
Generalized Anxiety Disorder
Other (please specify)
Heart Disease
High Blood Pressure
High Cholesterol
Hip Fracture
Memory Loss
Menopause
Neck Fracture
Osteoarthritis
Osteoporosis
Parkinson's Disease
Stroke

Section 2 Internet Connectivity

8. Do you have an Internet connection at home?
Yes.
No, but I am planning to have an Internet connection.
No, and I am not planning to have an Internet connection.

Section 3 Internet Access

9. Do you access and use the internet?
Yes
No

Section 4 Internet Usage

10. How would you describe your level of knowledge and experience in the use of computers?
I have no knowledge or experience of computers
I am a user with little knowledge and experience
I am a user with a lot of knowledge and experience
Other (please specify)

11. How long have you been using the Internet for?

Less than 6 months
6 months to 1 year
1 year to 2 years
2 years to 3 years
Over 3 years

12. How often do you use the internet?

Daily
Several times of the day (every hour)
Several times of the day (not every hour)
Weekly
Several times of the week (three times a week)
Several times of the week (Less than three times of the week)
Monthly
Less than monthly
Other (please specify)

13. What are your reasons for using the internet? (Please select the four most important).

To book appointments
Searching Google for information
For Banking (e.g. internet banking)
For Paying bills (e.g. rent)
For Work purposes (e.g. Paid / unpaid work done at home)
For Communication (e.g Checking Emails , Facebook, Video calling(Skype))
For Leisure
For general reading
For Travel purposes
For Entertainment purposes
For Seeking Health care information
For Interacting with government agencies (e.g Central and Local government services)
For online Shopping
Other (please specify)

14. Do any of the following ailments affect your use of the Internet? (Please select all that apply)

Vision Impairments
Learning difficulties (cannot see the words correctly)
Deafness
Arthritis of the hand
Arthritis of the fingers
Alzheimer's Disease
Balance Disorders
Ear Disorders
Dementia
Falls & Mobility Problems
Generalized Anxiety Disorder

Heart Disease
High Blood Pressure
Memory Loss
Neck Fracture
None of the above
Other (please specify)

Section 5 Do you have a tablet device?

15. Do you have a tablet device?
Yes.
No, I do not have a tablet yet, but I plan to have one.
No, and I do not intend to, or plan to have a tablet.

16. How long have you been using a tablet device?
Less than 6 months.
6 months to 1 year.
1 year to 2 years.
2 years to 3 years.
Over 3 years.

17. Who is the network provider of your tablet(s) device? (You may choose more than one option)
Saudi Telecommunication Company (STC).
Mobily.
Zeen.
Other (please specify)

18. How do you pay for your tablet device?
Pay as you go.
Pay on a monthly basis (Contract).
Other (please specify)

19. How often do you use the your tablet device?
Once a day.
More than once a day.
Weekly.
I only use it when I need to.
I rarely use it.
I never use it.
Other (please specify)

20. Where do you get information regarding the use of your tablet device? (You may choose more than one option)
Word of mouth from friends and family.
Tablets stores.
Media –TV, Radio and Newspapers.

Magazines.
Online social network.
Professional technology review websites.
Sales person
Other (please specify)

21. How long did it take you to get comfortable or familiar with using the basic functionalities of your present tablet device? Basic functionalities are described as: using the Internet services, and/or using communication services such as, email & Skype.
Less than a day
1 day – 1 week
1 week – 2 weeks
2 weeks – 1 month
1 month – 3 months
More than 3 months

Section 6 I do plan to get a tablet device

22. What are the reasons that you plan to use a tablet device? (You may choose more than one option)
I will get an upgrade from my provider.
I want a handy device that can do many things such as taking a photograph and surfing the web.
Most of my friends and/or friends have used tablets, and have convinced me to get one.
I want to use a tablet to contact my friends and/or family.
My new job or new position requires me to use a tablet.
I want to use a tablet to help with my well-being or health.
I travel a lot and the tablet will help me while travelling.
My new tablet will have a larger screen, which will be easy for me to view and use.
Other (please specify)

23. What are your plans for using the tablet device to interact with the MOI through its e-Portal? (You may choose more than one option)
I intend to use the tablet device as the sole channel to interact with the MOI through its e-Portal.
I intend to use the tablet device to interact with the MOI through its e-Portal as much as possible.
I am not sure.
I do not intend to use the tablet device to interact with the MOI through its e-Portal.
Other (please specify)

24. What is (are) your consideration(s) when buying a tablet device? (You may choose more than one option)
Appearance (such as colour or material).
Brand (such as Apple & Samsung).
Price of the tablet.
Camera capabilities.
Operating System (Such as iOS & Android).
Operating Speed.

Screen Size.
Screen Resolution.
Weight.
Battery life.
Size of Memory in the tablet to store files such as movies & documents.
Quality of Applications (apps).
Price of Applications (apps).
Number of Applications (apps) available in the app Market.
Support LTE (4G).
Other (please specify)

Section 7 I do not plan to get a tablet device.

25. What is/are the reasons/s for not getting a tablet? (You may choose more than one option)
I am too old for a tablet.
It is too much of an effort to use a tablet.
A tablet is too complicated and difficult to use.
I do not think a tablet is useful.
Physical discomfort or accessibility problems.
The cost of using a tablet – I do not want to spend a lot of money when using a tablet.
I just want to relax after my working hours.
I do not feel comfortable using small screens and keyboards (compared to desktop computers).
I do not know much about how to use a tablet.
I have other devices such as a laptop that can function as well, or better than a tablet.
Using a tablet does not fit with my lifestyle.
Other (please specify)

26. Factors that may encourage future use of a tablet device. (You may choose more than one option)
Nothing/ will never use a tablet in the future.
Free training.
Reduce cost of a tablet.
Reduce cost of monthly contracts.
Other (please specify)

Section 8 Primary Influence: Influence of the people who are important to you.

27. Please indicate to what extent you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) People who are important to me (e.g. friends, family and colleagues) think that I should use the Ministry of Interior (MOI) e-Portal.

Disagree 1 2 3 4 5 6 7 Agree

b) People who influence my behaviour (e.g. friends, family and colleagues) think that I should use MOI e-Portal. -www.moi.gov.sa –

Disagree 1 2 3 4 5 6 7 Agree

c) People whose opinions I value (e.g. friends, family and colleagues) think that I should use MOI e-Portal. -www.moi.gov.sa -

Disagree 1 2 3 4 5 6 7 Agree

Section 9 Perceived Cyber-risk: What are the risks of using online systems.

28. Please indicate to what extent you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) Using MOI e-Portal service could expose me to online frauds (e.g. stealing personal information such as by using a credit card when shopping or banking).

Disagree 1 2 3 4 5 6 7 Agree

b) Using MOI e-Portal service could expose me to identity theft (e.g. online impersonation in which a person pretend to be you, assuming another person's identity, fabricating an e-mail or Facebook account, Twitter account, etc.).

Disagree 1 2 3 4 5 6 7 Agree

c) Use of MOI e-Portal service could expose me to cyber criminals (people who commit online crimes).

Disagree 1 2 3 4 5 6 7 Agree

d) Using MOI e-Portal service could expose me to malicious attacks (e.g. hard drive damage, gaining access to private computer systems, viruses).

Disagree 1 2 3 4 5 6 7 Agree

Section 10 Perceived Website Assistance: Does the MOI e-Portal facilitate your activities?

29. Please indicate to what extent you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) I can get the information that I am interested in on this website. (MOI e-Portal)

Disagree 1 2 3 4 5 6 7 Agree

b) This website (MOI e-Portal) is easy-to-navigate (e.g. clickable links, in-site search feature, clear presentation)

Disagree 1 2 3 4 5 6 7 Agree

c) The way this website (MOI e-Portal) displays its services is efficient (e.g. clearly divided categories, demo clips and/or images, accurate titles)

Disagree 1 2 3 4 5 6 7 Agree

d) This website has good text size

Disagree 1 2 3 4 5 6 7 Agree

e) This website has good colours that I can see

Disagree 1 2 3 4 5 6 7 Agree

f) There is a good frequently answered section that I can consult for any confusing information

Disagree 1 2 3 4 5 6 7 Agree

g) The page or portal downloads very easily, which saves me time & effort

Disagree 1 2 3 4 5 6 7 Agree

Section 11 Compatibility: Compatibility of MOI e-Portal with your values, beliefs, experiences and needs.

30. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) I think using MOI e-Portal services fits well with the way that I like to gather information from the government.

Disagree 1 2 3 4 5 6 7 Agree

b) Using MOI e-Portal services to interact with the government fits into my lifestyle (e.g. culture, interests, values).

Disagree 1 2 3 4 5 6 7 Agree

c) Using MOI e-Portal services to interact with the government is incompatible with how I like to do things.

Disagree 1 2 3 4 5 6 7 Agree

Section 12 Relative Advantage: MOI e-Portal Vs. Traditional ways of interaction with the government.

31. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) Using MOI e-Portal services enhances my efficiency in gathering information and interacting with the government. (e.g. requires less time and/or effort)

Disagree 1 2 3 4 5 6 7 Agree

b) Using MOI e-Portal services does not make it easy to gather information from the government

Disagree 1 2 3 4 5 6 7 Agree

c) Using MOI e-Portal services makes it easier to interact with the government

Disagree 1 2 3 4 5 6 7 Agree

d) Using MOI e-Portal services gives me greater control over my interaction with the government

Disagree 1 2 3 4 5 6 7 Agree

Section 13 Image: The link between an MOI user and his/her image (status symbol).

32. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree

a) People who use the web to gather information from the government have a high profile (e.g. an outstanding and/or a recognised person in society)

Disagree 1 2 3 4 5 6 7 Agree

b) People who use MOI e-Portal services have a high profile

Disagree 1 2 3 4 5 6 7 Agree

c) People who use the web to gather information from the government have more prestige than those who do not (high status or reputation)

Disagree 1 2 3 4 5 6 7 Agree

d) Interacting with the government over the web enhances a person's social status

Disagree 1 2 3 4 5 6 7 Agree

Section 14 Complexity: Complexity of MOI e-Portal.

33. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) Learning to interact with MOI e-Portal is easy for me (e.g. In comparison to other web portals you have dealt with)

Disagree 1 2 3 4 5 6 7 Agree

b) I believe interacting with MOI e-Portal is a clear and understandable process

Disagree 1 2 3 4 5 6 7 Agree

c) I find MOI e-Portal to be flexible to interact with (e.g. fits with multiple

screen sizes, easy to navigate, clear layout)

Disagree 1 2 3 4 5 6 7 Agree

d) It is easy for me to become skillful at using MOI e-Portal (e.g. having good knowledge and experience to deal with the portal)

Disagree 1 2 3 4 5 6 7 Agree

e) I find MOI e-Portal difficult to use

Disagree 1 2 3 4 5 6 7 Agree

Section 15 Use Intentions: Intentions to use MOI e-Portal

34. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree

a) I will use MOI e-Portal for gathering government information

Disagree 1 2 3 4 5 6 7 Agree

b) I will use MOI e-Portal services provided over the Internet, Web, portal

Disagree 1 2 3 4 5 6 7 Agree

c) I will not hesitate to provide information to the MOI e-Portal

Disagree 1 2 3 4 5 6 7 Agree

Section 16 Reasons for not accessing the Internet.

35. What are your reasons for not accessing the Internet? (You may choose more than one option)

Just not interested
I do not have the skills
I do not feel comfortable using the internet
Privacy worries (criminals might take control of my personal information)
Bad experiences with hackers/virus
Too old to learn
I am too busy
Other (please specify)

Section 17 Reasons for not planning to have an Internet connection at home

36. What are the reasons for not planning to have an Internet connection at home? (You may choose more than one option)

I am not interested
I do not have the skills
Because it is expensive
I do not feel comfortable using the internet
Privacy worries (criminals might take control of my personal information)
Bad experiences with hackers/virus
Too old to learn
I am too busy
Other (please specify)

Section 18 Plans to have an Internet connection.

37. What are the reasons that are making you plan to have an Internet connection at home?

To be able to get any information I want.
To participate in social networks.
To communicate through email, Skype, Yahoo,
To use it for entertainment.
To use it for online education.
To use it for online banking.
To use it for electronic government services.
Other (please specify)

38. What type of Internet connection do you plan to acquire?

DSL	cable
Satellite	fixed/broadcast wireless
Cellular	dial-up
I'm not sure	
Other (please specify)	

Section 19 Trust: Trust of the Internet

39. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) The Internet has enough safeguards (e.g. firewalls & security certificate) to make me feel comfortable using it to transact personal information with MOI e-Portal

Disagree 1 2 3 4 5 6 7 Agree

b) I feel assured that legal and technological structures adequately protect me from problems on the Internet. (e.g. related protection regulations, terms and conditions agreement)

Disagree 1 2 3 4 5 6 7 Agree

c) In general, the Internet is now a robust and safe environment in which to transact with MOI e-Portal (e.g. Padlock icons symbolising a secure web transaction)

Disagree 1 2 3 4 5 6 7 Agree

Section 20 Trust of the government

40. Please indicate to what extent you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) I think I can trust government agencies (believe in the integrity and ability of the agency providing the service)

Disagree 1 2 3 4 5 6 7 Agree

b) Government agencies can be trusted to carry out online transactions faithfully

Disagree 1 2 3 4 5 6 7 Agree

c) I trust government agencies to keep my best interests in mind

Disagree 1 2 3 4 5 6 7 Agree

d) In my opinion, government agencies are trustworthy

Disagree 1 2 3 4 5 6 7 Agree

Section 21 Disposition to Trust: Tendency to believe or not to believe in others

41. Please indicate to what extent do you agree or disagree with the following statements. Please rate each of the provided following factors on the seven-point scale. Note: 1 is Strongly Disagree and 7 is Strongly Agree.

a) I generally do not trust other people

Disagree 1 2 3 4 5 6 7 Agree

b) I generally have faith in humanity

Disagree 1 2 3 4 5 6 7 Agree

c) I feel that people are generally reliable

Disagree 1 2 3 4 5 6 7 Agree

d) In general I trust other people unless they give me reason not to

Disagree 1 2 3 4 5 6 7 Agree

End of Questions.

Thank you very much for your valuable time, co-operation and patience in completing this questionnaire! If you have any questions, comments, suggestions or would like to find out about the results of this research, please do not hesitate in getting in touch with us at:

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Final Survey Questionnaire in Arabic

تقَبُّل خدمات الحكومة الإلكترونية من قِبَل المواطنين البالغين من العمر ٥٠ سنة فما فوق في مدينة حائل

السادة الاعزّاء
تحية طيبة وبعد،

نود ان نلتمس تعاونكم في الإجابة عن هذا الاستطلاع، وهو مشروع بحثي مهم يُجرى في قسم القيادة والإدارة والتنظيم (SSAHRI) بجامعة هيرتفوردشاير ؛ وحدة العلوم الاجتماعية والفنون والبحوث الإنسانية ؛ كلية هيرتفوردشاير لإدارة الأعمال، هيرتفوردشاير، المملكة المتحدة. الناس في كل الدول في جميع أنحاء العالم أصبحوا يُعمِّرون لسنوات أطول. وإلى جانب ذلك ، تُقَدَّم حالياً تكنولوجيات جديدة في مجال المعلومات والإتصالات، وتقوم الحكومات أيضاً بتوفير هذه التكنولوجيات واستخدامها. وهذا يعني أنه ليس كل السكان يستخدمون هذه التكنولوجيا، حيث أن بعض الناس قد لايكونون مهتمين بها، وقد لا يمتلك بعضهم ما يكفي من المال او المهارات اللازمة لاستخدام الإنترنت. والغرض من هذه الدراسة هو تحديد وشرح التحديات القائمة التي تواجه كبار السن عند استخدام الخدمات الإلكترونية في احدى الدول النامية في الشرق الأوسط، ونتحدث هنا عن المملكة العربية السعودية، وتحديداً مدينة حائل. ويركز هذا الاستطلاع على الخدمات التي تقدمها البوابة الالكترونية الخاصة بوزارة الداخلية للمواطنين. وعنوان هذه البوابة الإلكترونية على شبكة الانترنت هو www.moi.gov.sa .

إجراء هذه الدراسة أمر مهم جداً لأن هذه المجالات البحثية لم تحظ في بلدي بما يكفي من البحث والاستقصاء. أتمنى وبكل تواضع ان يستفيد كلٌّ من المواطنين والمسؤولين الحكوميين في بلدي من هذه الدراسة المقترحة. ومن باب العلم، يتضمن هذا الاستطلاع عدداً من الاسئلة التي سوف تستغرق الإجابة عنها نحو ٢٥ دقيقة . يُرجى اختيار الاجابات المناسبة عن طريق وضع علامة امامها. وإذا لم تجد إجابتك ضمن الخيارات المعروضة ، فيُرجى التكرم بذكر اجابتك في فئة الخيار المسمى "غير ذلك". ولك أن تترك أي اسئلة لاترغب في الإجابة عنها. وثِق تماماً أن اي معلومات تقدمها سوف تُستخدم لأغراض البحث العلمي فقط. وقد حصل هذا الاستطلاع على موافقة لجنة الأخلاقيات التابعة لجامعة هيرتفوردشاير بالبروتوكول رقم cBUS/PG/UH/00854.

وأود أن اغتنم هذه الفرصة لأشكركم مقدماً على وقتكم وسعة صدركم وتعاونكم. ويمكن للمشاركين في هذا الاستطلاع أن يطلبوا الحصول على معلومات عن نتائج هذا المشروع البحثي عن طريق مراسلة المشرف او الباحث او كليهما عبر البريد الإلكتروني.

المشرف: البروفسور جيوتي جاودري استاذ نظم المعلومات جامعة هيرتفوردشاير كلية إدارة الأعمال وحدة أبحاث إدارة النظام (SyMRU) DeHavilland campus Hatfield Herts AL10 9EU البريد الإلكتروني: j.choudrie@herts.ac.uk، jyotichoudrie@gmail.com الهاتف: +441707281271	الباحث: عادل الفلاح طالب دكتوراه في جامعة هيرتفوردشاير كلية إدارة الأعمال العنوان البريدي: 6 Lisa Court, Frank's Lane، Cambridgeshire،Cambridge CB4 1SW البريد الإلكتروني: aas131@hotmail.com الهاتف الجوال: +966532094651 / +447908223353

معلومات أساسية

34. يُرجى تحديد الفئة العمرية التي تنتمي إليها
٥٠-٥٩
٦٠-٦٩
٧٠-٧٩
٨٠-٨٩
فوق ٩٠

35. يُرجى تحديد الجنس
ذكر
أنثى

36. يُرجى تحديد المؤهل العلمي
درجة عليا / درجة دراسات عليا - ماجستير أو دكتوراة
بكالوريوس
دبلوم جامعي
شهادة فنية
الشهادة الثانوية
الشهادة الإعدادية
تستطيع القراءة والكتابة باللغة العربية
أُمِّي
غير ذلك (يُرجى التحديد)

37. ماوضعك الوظيفي الحالي
متقاعد / فوق ٦٥ سنة
متقاعد / تحت ٦٥ سنة
موظف دوام كامل
موظف دوام جزئي
مهنة حرة
لي عملي الخاص
بلا عمل / لأقل من ٦ أشهر
بلا عمل / لأكثر من ٦ أشهر
بلا عمل / لأسباب طبية
طالب متفرغ
طالب غير متفرغ
غير ذلك (يُرجى التحديد)

38. يُرجى تحديد وظيفتك الحالية، وإذا كنت متقاعداً يُرجى تحديد الوظيفة التي شغلتها في معظم حياتك الوظيفية

أكاديمي / معلم
مُشرّع / مدير
زراعي
موظف
خدمات / مبيعات
حرفة / تجارة
عمل حر
طالب
غير ذلك (يُرجى التحديد)

39. ما أنسب وصف لحالتك الصحية مما يلي
ممتازة
جيدة
ضعيفة

40. هل يمكنك ذكر المرض أو الأمراض التي عانيت منها بسبب التقدم في السن
مرض الزهايمر
أمراض القلب
إلتهاب المفاصل
ارتفاع ضغط الدم
اضطرابات في التوازن
ارتفاع الكوليسترول
السرطان
أمراض العيون
فقدان الذاكرة
اضطرابات في الأذن
اكتئاب
مرض السكري
تخلخل العظم
السقوط ومشكلات في الحركة
الشلل الرعاش
القلق
سكتة دماغية
لا شيء مما سبق

الإتصال بالإنترنت

41. لديك إتصال بالإنترنت في المنزل
نعم
لا ، ولكني أنوي توفير اتصال بالانترنت في المنزل
لا ، ولا أنوي توفير اتصال بالإنترنت في المنزل

الدخول الى الإنترنت

42. هل تقوم بالدخول الى الإنترنت واستخدامه

نعم

لا

استخدام الإنترنت

43. كيف تصف مستوى معرفتك وخبرتك باستخدام أجهزة الحاسوب

ليس لدي أي معرفة أو خبرة باستخدام اجهزة الحاسوب
أنا مستخدم للحاسوب ذو معرفة وخبرة ضئيلتين
أنا مستخدم للحاسوب ذو معرفة وخبرة كبيرتين
غير ذلك (يُرجى التحديد)

44. منذ متى وأنت تستخدم الإنترنت

أقل من ستة أشهر
من ستة أشهر إلى عام
من عام الى عامين
من عامين إلى ثلاثة أعوام
أكثر من ثلاثة أعوام

45. ما معدل إستخدامك للإنترنت

يومياً
مرات عديدة يومياً / كل ساعة
مرات عديدة يومياً / ليس كل ساعة
أسبوعياً
مرات عديدة أسبوعياً / ثلاث مرات أسبوعياً
مرات عديدة أسبوعياً / أقل من ثلاث مرات
شهرياً
أقل من شهرياً

46. ما دوافعك لإستخدام الإنترنت / يُرجى اختيار اهم اربعة خيارات

للقراءة العامة
لأغراض السفر
لأغراض التسلية
للبحث عن معلومات خاصة بالرعاية الصحية
للتفاعل مع الهيئات الحكومية / مثل الخدمات الحكومية المركزية والمحلية
للتسوق الإلكتروني
غير ذلك (يُرجى التحديد)

لحجز المواعيد
استخدام محركات البحث للبحث عن معلومات
للأعمال المصرفية / مثل الخدمات المصرفية الإلكترونية
لدفع الفواتير
لأغراض العمل / مثل الأعمال المدفوعة او الغير مدفوعة التي تُنجز من المنزل
للتواصل / مثل فحص البريد الإلكتروني ، والفيس بوك ، ومكالمات الفيديو مثل سكايب
للرفاهية

47. هل يتأثر استخدامك للإنترنت بأي من الأمراض التالية / يُرجى اختيار جميع الخيارات التي تنطبق

الزهايمر
ارتفاع ضغط الدم
فقدان الذاكرة
اضطرابات في التوازن
مشاكل في الرقبة
اضطرابات في الأذن
لاشيء مما سبق
غير ذلك (يُرجى التحديد)

ضعف الرؤية / رؤية الشاشة ، النصوص الموجودة في الشاشة ، ألوان الشاشة
صعوبات التعلم / عدم التمكن من رؤية الكلمات بشكل صحيح
السقوط ومشكلات في الحركة
الصمم
اضطرابات القلق
التهاب مفاصل اليد
أمراض القلب
التهاب مفاصل الأصابع

هل لديك جهاز لوحي

48. هل لديك جهاز لوحي / مثال: الآيباد

نعم

لا، ليس لدي جهاز لوحي حتى الآن ولكن انوي اقتناءه
لا، ولا انوي أو اخطط لاقتناء جهاز لوحي

49. منذ متى وأنت تستخدم الجهاز اللوحي

أقل من ٦ أشهر
من ٦ أشهر إلى عام
من عام الى عامين
من عامين الى ثلاثة أعوام
أكثر من ثلاثة أعوام

50. مالشبكة التي تُزود جهازك اللوحي بخدمة الإنترنت / يمكنك اختيار أكثر من خيار واحد

شركة الإتصالات السعودية **STC**
شركة موبايلي
شركة زين
غير ذلك (يُرجى التحديد)

51. ماهو نظام الدفع الخاص بجهازك اللوحي

الدفع حسب الإستخدام
الدفع على أساس شهري / عقد
غير ذلك (يُرجى التحديد)

52. ماهو معدل إستخدامك للجهاز اللوحي

أستخدمه مرة واحدة في اليوم
أستخدمه أكثر من مرة في اليوم
أستخدمه بشكل أسبوعي
أستخدمه فقط عند حاجتي إليه
نادراً ماأستخدمه
لا أستخدمه أبداً
غير ذلك (يُرجى التحديد)

53. من أين تحصل على معلومات بشأن إستخدام جهازك اللوحي / يمكنك إختيار أكثر من خيار واحد

توصية شخصية من الأصدقاء أو العائلة
متاجر الأجهزة اللوحية
وسائل الإعلام / التلفاز، والراديو ،ا لمجلات والجرائد

الشبكات الإجتماعية على الإنترنت
مواقع تقييم التكنولوجيا الإحترافية
بائع
غير ذلك (يُرجى التحديد)

54. كم استغرقت من الوقت لتعتاد على استخدام الوظائف الأساسية لجهازك اللوحي الحالي بسهولة؟ (تُوصف الوظائف الأساسية بأنها: استخدام خدمات الإنترنت، أو استخدام خدمات التواصل مثل البريد الإلكتروني وسكايب)

أقل من يوم
من أسبوعين الى شهر
من يوم الى اسبوع
من شهر الى ثلاثة أشهر
من أسبوع الى أسبوعين
أكثر من ثلاثة أشهر

أخطط لإقتناء جهاز لوحي

55. ما دوافعك للتخطيط لاستخدام جهاز لوحي / يمكنك اختيار أكثر من خيار واحد

سأحصل على عرض جيد من مزود الخدمة
أود اقتناء جهاز يدوي يقوم بعمل الكثير من الأشياء مثل التقاط الصور، وتصوير الفيديو، وتصفح الإنترنت
معظم أصدقائي استخدموا الأجهزة اللوحية، وأقنعوني باقتناء جهاز لوحي
أود استخدام الجهاز اللوحي للإتصال بالأصدقاء والعائلة
تتطلب وظيفتي الجديدة أو منصبي الجديد استخدام جهاز لوحي
أود استخدام الجهاز اللوحي للمساعدة في تحسين مستوى رفاهيتي أو صحتي
كثيراً ما أسافر ، وسيساعدني الجهاز اللوحي أثناء سفري
سيحتوي الجهاز اللوحي الجديد الخاص بي على شاشة أكبر ، مما يسهل عمليتيْ الرؤية والإستخدام
غير ذلك (يُرجى التحديد)

56. ماخططك لاستخدام الجهاز اللوحي من أجل التفاعل مع وزارة الداخلية عبر بوابتها الإلكترونية / يمكنك اختيار أكثر من خيار واحد

انوي استخدام الجهاز اللوحي ليكون قناتي الوحيدة للتفاعل مع وزارة الداخلية عبر بوابتها الإلكترونية
انوي استخدام الجهاز اللوحي للتفاعل مع وزارة الداخلية عبر بوابتها الإلكترونية كلما أمكن
لست متأكداً
لا أنوي استخدام الجهاز اللوحي للتفاعل مع وزارة الداخلية عبر بوابتها الإلكترونية

غير ذلك (يُرجى التحديد)

57. ما الأمور التي تضعها في اعتبارك عند شراء جهاز لوحي / يمكنك إختيار أكثر من خيار واحد

الوزن
عمر البطارية
حجم الذاكرة الموجودة في الجهاز اللوحي لتخزين الملفات مثل الأفلام والمستندات
جودة التطبيقات
سعر التطبيقات
عدد التطبيقات المتاحة في سوق التطبيقات
دعم التطوير طويل الأمد / الجيل الرابع
الشكل / مثل اللون أو المادة
العلامة التجارية / مثل ابل و سامسونج
سعر الجهاز
إمكانيات الكاميرا
نظام التشغيل / مثل نظام آي او اس ونظام اندرويد
سرعة التشغيل
حجم الشاشة
مستوى دقة الشاشة
غير ذلك (يُرجى التحديد)

لا أخطط لإقتناء جهاز لوحي

58. ما دوافعك لعدم اقتناء جهاز لوحي / يمكنك اختيار أكثر من خيار واحد

بسبب كِبر السن لا يمكنني استخدام جهاز لوحي
يأخذ استخدام الجهاز اللوحي مني مجهوداً كبيراً
الجهاز اللوحي معقد وصعب الإستخدام
لا أعتقد أن الجهاز اللوحي مفيد
مشقة جسدية أو مشكلات في الدخول
تكلفة استخدام الجهاز اللوحي / لا أرغب في انفاق لكثير من المال عند استخدام الجهاز اللوحي
ود فقط أن انال قسطاً من الراحة بعد ساعات عملي
لا أشعر بالراحة عند استخدام شاشات ولوحات مفاتيح صغيرة نسبياً / إذا ما قورنت بالحاسوب المكتبي
لا أعلم الكثير عن استخدام الجهاز اللوحي

لدي أجهزة أخرى مثل جهاز الكمبيوتر المحمول (اللابتوب) الذي يؤدي وظيفته كالجهاز اللوحي أو أفضل منه

استخدام الجهاز اللوحي لا يتناسب مع اسلوب حياتي

غير ذلك (يُرجى التحديد)

59.العوامل التي تشجع على الاستخدام المستقبلي للجهاز اللوحي / يمكنك اختيار اكثر من خيار واحد

لا شيء / لن استخدم الجهاز اللوحي في المستقبل

التدريب المجاني على استخدام الجهاز اللوحي

انخفاض تكلفة الجهاز اللوحي

انخفاض تكلفة الإشتراكات الشهرية

غير ذلك (يُرجى التحديد)

التأثير الأولي: تأثير الأشخاص المهمين بالنسبة إليك

60.يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً)، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

www.moi.gov.sa يرى الأشخاص المهمين بالنسبة لي (مثل : أصدقائي وزملائي وأسرتي) أنني ينبغي أن استخدم البوابة الإلكترونية لوزارة الداخلية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يرى الأشخاص الذين يؤثرون في سلوكي (مثل : أصدقائي وزملائي وأسرتي) أنني ينبغي أن استخدم البوابة الإلكترونية لوزارة الداخلية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يرى أولئك الذين أُقدِّر آراءهم (مثل : أصدقائي وزملائي وأسرتي) أنني ينبغي أن استخدم البوابة الإلكترونية لوزارة الداخلية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

المخاطر الإلكترونية الملموسة : ما مخاطر استخدام أنظمة الإنترنت

61.يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

قد يُعرّضني استخدام خدمات البوابة الإلكترونية لوزارة الداخلية الى الإحتيال عبر الإنترنت/ مثل سرقة البيانات الشخصية كأن يكون ذلك باستخدام البطاقة الإئتمانية عند التسوق أو اتمام بعض العمليات المصرفية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

قد يُعرّضني استخدام خدمات البوابة الإلكترونية لوزارة الداخلية الى سرقة الهوية / مثل انتحال الشخصية عبر الإنترنت والتي يدّعي فيها شخصٌ ما أنه أنت ، منتحلاً هويتك ، ويُزيّف البريد الإلكتروني ، أو حساب الفيسبوك ، أو حساب تويتر ، وغيرها

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

قد يُعرّضني استخدام خدمات البوابة الإلكترونية لوزارة الداخلية الى قراصنة الإنترنت / اولئك الذين يرتكبون جرائم عبر الإنترنت

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

قد يُعرّضني استخدام خدمات البوابة الإلكترونية لوزارة الداخلية الى هجمات كيديّة / مثل إتلاف محرك الأقراص الصلبة ، أو الدخول الى أنظمة الحاسب الآلي الشخصية ، أو الفيروسات

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

المساعدة الملموسة بالموقع الإلكتروني لوزارة الداخلية

62.يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً).

يمكنني الحصول على المعلومات التي أهتم بها من خلال هذا الموقع الإلكتروني / البوابة الإلكترونية لوزارة الداخلية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

البوابة الإلكترونية لوزارة الداخلية سهلة التصفح / مثل وجود روابط قابلة للنقر ، وميزة البحث داخل الموقع ، والعرض الواضح

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

الطريقة التي يعرض بها هذا الموقع الإلكتروني خدماته، طريقة فعّالة / مثل : الأجزاء مُقسّمة بشكل واضح ، مقاطع وصور توضيحية للخدمات ، والعناوين دقيقة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

نصوص هذا الموقع الإلكتروني تظهر بحجم جيد

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يتمتع هذا الموقع الألكتروني بألوان جيدة يمكنني رؤيتها

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

هناك قسم جيد للإجابات المتكررة التي يمكنني الرجوع إليها عند تشتت المعلومات

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

تعمل خاصية التحميل بالبوابة الإلكترونية بشكل مبسط ، مما يوفر وقتي

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

تَوافق البوابة الإلكترونية لوزارة الداخلية مع قِيَمك ومعتقداتك وخبراتك واحتياجاتك

63. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

أرى أن استخدام خدمات البوابة الإلكترونية لوزارة الداخلية يتناسب جيداً مع الطريقة التي أُحب أن أجمع بها معلومات وأتفاعل مع الحكومة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

استخدام خدمات البوابة الإلكترونية لوزارة الداخلية للتفاعل مع الحكومة يتناسب مع أسلوب حياتي / مثل الثقافة ، والإهتمامات ، والقِيَم

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

استخدام خدمات البوابة الإلكترونية لوزارة الداخلية للتفاعل مع الحكومة لا يتوافق مع الطريقة التي أُحب أن انجز بها

مهماتي

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

الفائدة النسبية للبوابة الإلكترونية لوزارة الداخلية مقابل الطرق التقليدية للتفاعل مع الحكومة

64. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

يُعزّز استخدام خدمات البوابة الإلكترونية لوزارة الداخلية من كفاءتي في جمع المعلومات والتفاعل مع الحكومة / كأن يتطلب ذلك القليل من الوقت والجهد مقارنةً بالطرق التقليدية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

لا يعمل استخدام خدمات البوابة الإلكترونية لوزارة الداخلية على تيسير جمع معلومات من الحكومة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يجعل استخدام خدمات البوابة الإلكترونية لوزارة الداخلية الأمر سهلاً في التفاعل مع الحكومة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يتيح لي استخدام خدمات البوابة الإلكترونية لوزارة الداخلية تحكماً أكبر في التفاعل مع الحكومة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

الإنطباع العام: العلاقة بين مستخدم البوابة الإلكترونية لوزارة الداخلية وصورته الذهنية

-المقصود هنا بالإنطباع العام، أن استخدام خدمات البوابة الألكترونية لوزارة الداخلية قد يكون دلالة على المنزلة الرفيعة.

65. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي

يتمتع الأشخاص الذين يستخدمون الإنترنت لجمع معلومات من الحكومة بمكانة رفيعة / مثل: شخص مشهور أو معروف في المجتمع

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماماً

يتمتع الأشخاص الذين يستخدمون خدمات البوابة الألكترونية لوزارة الداخلية بمكانة رفيعة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

يتمتع الأشخاص الذين يستخدمون الويب (المواقع) لجمع معلومات من الحكومة بمكانة أكبر من غيرهم / مكانة عالية أو

سمعة حسنة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

التفاعل مع الحكومة عبر الإنترنت يعزّز الوضع الإجتماعي للشخص

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

الصعوبة والتعقيد: تعقيدات البوابة الإلكترونية لوزارة الداخلية

66. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

من السهل تعلّم كيفية التفاعل مع البوابة الإلكترونية لوزارة الداخلية / إذا ما قورنت بالبوابات الإلكترونية الأخرى التي تفاعلت معها مثلاً

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أعتقد أن التفاعل مع البوابة الإلكترونية لوزارة الداخلية عملية واضحة ومفهومة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أرى أن البوابة الإلكترونية لوزارة الداخلية مرنة في التفاعل معها / على سبيل المثال: تتناسب مع أحجام الشاشة المتعددة، وسهلة التصفح، وذات تصميم واضح

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أرى أنه من السهل أن اصبح محترفاً في استخدام البوابة الإلكترونية لوزارة الداخلية / كأن أكون صاحب معرفة وخبرة في كيفية التعامل مع البوابة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أرى أن استخدام البوابة الإلكترونية لوزارة الداخلية أمر صعب

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أغراض الإستخدام: أغراض استخدام البوابة الإلكترونية لوزارة الداخلية

36. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً).

سأستخدم البوابة الإلكترونية لوزارة الداخلية في جمع المعلومات الحكومية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

التفاعل مع البوابة الإلكترونية لوزارة الداخلية هو أمر سأقوم به

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

لن أتردد في تزويد البوابة الإلكترونية لوزارة الداخلية بالمعلومات
متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أسباب عدم استخدام الإنترنت

37. ما أسباب عدم استخدامك للإنترنت / يمكنك اختيار اكثر من خيار واحد

فقط لا أهتم
ليس لدي المهارات اللازمة
لا أشعر بالراحة عند استخدام الإنترنت
مخاوف شخصية / قد يستولي قراصنة الإنترنت على بياناتي الشخصية
تجارب سيئة مع القراصنة أو الفيروسات
تقدمت بالسن لدرجة كبيرة ولا يمكنني التعلّم
مشغول بدرجة كبيرة
غير ذلك (يُرجى التحديد)

أسباب عدم التخطيط لاقتناء إتصال بالإنترنت في المنزل

42. ما أسباب عدم تخطيطك لإقتناء اتصال إنترنت في المنزل / يمكنك اختيار أكثر من خيار واحد

لا أهتم
ليس لديّ المهارات اللازمة
لأنه مُكلف مادياً
لا أشعر بالراحة عند استخدام الإنترنت
مخاوف شخصية / قد يستولي قراصنة الإنترنت على بياناتي الشخصية
تجارب سيئة مع القراصنة أو الفيروسات
تقدمت بالسن لدرجة كبيرة ولا يمكنني التعلّم
مشغول بدرجة كبيرة
غير ذلك (يُرجى التحديد)

التخطيط لإقتناء اتصال إنترنت في المنزل

43. ما الأسباب التي تجعلك تُخطِّط لإقتناء اتصال انترنت في المنزل / يمكن اختيار أكثر من خيار واحد

لكي أتمكن من الحصول على أي معلومات اريدها
للمشاركة في شبكات التواصل الإجتماعي
للتواصل عبر البريد الإلكتروني، وسكايب ، والياهو
لإستخدامه للتسلية

لإستخدامه للتعليم الإلكتروني
لإستخدامه للعمليات المصرفية الإلكترونية
لإستخدامه من أجل الخدمات الحكومية الإلكترونية
غير ذلك (يُرجى التحديد)

44. ما نوع إتصال الإنترنت الذي تود الإشتراك به

دي إس ال / DSL
كابل
القمر الصناعي
بث هوائي ثابت
جوال
الطلب الهاتفي
لست متأكداً
غير ذلك (يُرجى التحديد)

الثقة في الإنترنت

45. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً). العوامل هي:

يتمتع الإنترنت بأساليب وقائية كافية (مثل جدران الحماية، وشهادات الأمان) تجعلني أشعر بالإطمئنان عند استخدام الإنترنت لنقل البيانات الشخصية عبر البوابة الإلكترونية لوزارة الداخلية

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أشعر بالإطمئنان لوجود هياكل قانونية وفنية كافية لحمايتي من المشكلات التي قد تواجهني عبر الإنترنت / مثل لوائح الحماية ذات الصلة، واتفاق الشروط والأحكام

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

بشكل عام ، الإنترنت الآن بيئة آمنة ومنيعة حيث يمكنك التعامل مع البوابة الإلكترونية لوزارة الداخلية بطمأنينة / مثل أيقونات القفل التي ترمز الى تفاعل آمن عبر صفحات الإنترنت

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

الثقة في الحكومة

46. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً).

أظن أنني يمكنني الثقة في الهيئات الحكومية / أثق في نزاهة الهيئة وقدرتها على تقديم الخدمة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

يمكن الوثوق في الهيئات الحكومية لإجراء معاملات عبر الإنترنت بثقة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أثق في أن الهيئات الحكومية تُراعي تحقيق مصالحي على أفضل وجه

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

الهيئات الحكومية في رأيي، جديرة بالثقة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

قابلية الثقة: قابلية الثقة أو عدم الثقة في الآخرين

47. يُرجى الإشارة إلى أي مدى تتفق أو لا تتفق مع الجمل التالية ، ويُرجى وضع معدل كل من العوامل الواردة أدناه وفق معيار من سبع درجات / ملحوظة : يشير رقم ١ في المعدل الى (غيرمتفق تماماً) ، بينما يشير رقم ٧ الى (متفق تماماً).

لا أثق في الآخرين بوجه عام

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

لدي ثقة في البَشَر بوجه عام

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

اشعر بأن الناس عموماً جديرون بالثقة

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

أثق عموماً في الأشخاص الآخرين ما لم يظهر منهم ما يمنعني من الثقة بهم

متفق تماماً (٧) (٦) (٥) (٤) (٣) (٢) (١) غير متفق تماما

نهاية الأسئلة

شكراً جزيلاً على وقتكم الثمين وتعاونكم وسعة صدركم في إكمال هذا الإستبيان. إذا كانت لديكم أيّ أسئلة أو تعليقات أو اقتراحات أو إذا اردتم الإطّلاع على نتائج هذا البحث، يُرجى عدم التردد في الإتصال بنا على

المشرف: البروفسور جيوتي جاودري استاذ نظم المعلومات جامعة هيرتفوردشاير كلية إدارة الأعمال وحدة أبحاث إدارة النظام (SyMRU) DeHavilland campus Hatfield Herts AL10 9EU البريد الإلكتروني: j.choudrie@herts.ac.uk ، jyotichoudrie@gmail.com الهاتف: +441707281271	الباحث: عادل الفلاح طالب دكتوراه في جامعة هيرتفوردشاير كلية إدارة الأعمال العنوان البريدي: 6 Lisa Court, Frank's Lane، Cambridge، Cambridgeshire CB4 1SW البريد الإلكتروني: aas131@hotmail.com الهاتف الجوال: 447908223353+ / 966532094651+

Appendix 5-2 Final Analysis

Demographic Variables

Internet Adoption Status (n=937)		
Intervals	**Frequency**	**Percent**
Adopters	703	75.0
Non-Adopters	218	23.3
Planning to become Adopters	16	1.7

Internet Experience – Internet Adopters only (n=703)		
Intervals	**Frequency**	**Percent**
Less than 6 months	3	0.4
6 months to 1 year	12	1.7
1 year to 2 years	76	10.8
2 years to 3 years	121	17.2
Over 3 years	491	69.8

Internet Use Frequency – Internet Adopters only (n=703)		
Intervals	**Frequency**	**Percent**
Several times a day (every hour)	28	4
Several times a day (not every hour)	132	18.8
Daily	400	56.9
Several times a week (three times a week)	84	11.9
Several times a week (Less than three times)	37	5.3
Weekly	22	3.1

Internet Activities (n=937)		
Intervals	**Frequency**	**Percent**
To book appointments	16	1.7
Searching Google for information	407	43.4
For banking	73	7.8
For paying bills	31	3.3
For work purposes	47	5
For communication (e.g. emails)	203	21.7
For leisure	60	6.4
For general reading	246	26.3
For travel purposes	21	2.2
For entertainment purposes	242	25.8
For seeking health care information	159	17
For interacting with government agencies	70	7.5
For online shopping	26	2.8

Computer Experience – Internet Adopters only (n=703)		
Intervals	**Frequency**	**Percent**
I am a user with little knowledge and experience	556	79.1
I have no knowledge or experience of computers	58	8.3
I am a user with a lot of knowledge and experience	89	12.7

Tablet Adoption Status (n=937)		
Intervals	**Frequency**	**Percent**
Adopters	81	8.6
Non-Adopters	744	79.4
Planning to become Adopters	112	12.0

Tablet Experience – Tablets Adopters only (n=81)		
Intervals	**Frequency**	**Percent**
Less than 6 months	2	2.5
6 months to 1 year	10	12.3
1 year to 2 years	24	29.6
2 years to 3 years	26	32.1
Over 3 years	19	23.5

Tablet Experience – Tablets Adopters only (n=81)		
Intervals	**Frequency**	**Percent**
Less than 6 months	2	2.5
6 months to 1 year	10	12.3
1 year to 2 years	24	29.6
2 years to 3 years	26	32.1
Over 3 years	19	23.5

Tablet Network Provider– Tablets Adopters only (n=81)		
Intervals	**Frequency**	**Percent**
Saudi Telecommunication Company (STC)	28	34.5
Mobily	43	53
Zeen	10	12.3

Tablet Subscription (n=81)		
Intervals	**Frequency**	**Percent**
Pay as you go	74	91.4
Pay on a monthly basis (Contract)	7	8.6

Tablet Use Frequency – Internet Adopters only (n=81)		
Intervals	**Frequency**	**Percent**
More than once a day	37	45.7
Once a day	14	17.3
Weekly	1	1.2
I only use it when I need to	29	35.8

Ailments Due to Old Age (n=937)		
Intervals	**Frequency**	**Percent**
Alzheimer's Disease	3	0.3
Arthritis	83	8.8
Balance Disorders	24	2.6
Cancer	6	0.6
Eye Diseases	103	11
Ear Disorders	37	3.9
Depression	1	0.1
Diabetes	129	13.8
Falls & Mobility Problems	37	3.9
Generalized Anxiety Disorder	14	1.5
Heart Disease	46	4.9
High Blood Pressure	86	9.2
High Cholesterol	56	6
Hip Fracture	18	1.9
Neck Fracture	33	3.5
Osteoarthritis	17	1.8
Osteoporosis	15	1.6
Parkinson’s Disease	6	0.6
Stroke	29	3.1
Rheumatism	32	3.4
Other aging disease(s)	203	21.7

Ailments Affect Internet Use (n=937)		
Intervals	**Frequency**	**Percent**
Vision Impairments	226	24.1
Arthritis of the Hand	56	6
Arthritis of the Fingers	27	2.9
Alzheimer's Disease	2	0.2
Balance Disorders	4	0.4
Ear Disorders	17	1.8
Diabetes	77	8.2
Falls & Mobility Problems	4	0.4
Generalized Anxiety Disorder	3	0.3
Heart Disease	29	3.1
High Blood Pressure	22	2.3
Memory Loss	6	0.6
Neck Fracture	45	4.8
Rheumatism	15	1.6
Respiratory problems	6	0.6
Stroke	7	0.7
Other Diseases	41	4.4
None	269	28.7

Reasons for not accessing the Internet (n=234)		
Intervals	**Frequency**	**Percent**
I do not have the skills	105	44.8
I do not feel comfortable using the Internet	13	5.5
Just not interested	39	16.6
Too old to learn	77	32.9
I am too busy	2	0.8
Other reasons	6	2.5

Reasons for not planning to have an Internet connection at home (n=32)		
Intervals	**Frequency**	**Percent**
I am not interested	10	31.2
I do not have the skills	16	50
Because it is expensive	1	3.1
Too old to learn	20	62.5
Privacy worries	2	0.8
Other reasons	1	3.1

Type of Internet connection you plan to acquire (n=16)		
Intervals	**Frequency**	**Percent**
Cellular	6	37.5
DSL	3	0.3
Fixed/Broadcast wireless	3	0.3
I'm not sure	4	0.4

Plans for using tablet to interact with MOI (n=112)		
Intervals	**Frequency**	**Percent**
I intend to use the tablet device as the sole channel to interact with the MOI through its e-Portal.	0	0
I intend to use the tablet device to interact with the MOI through its e-Portal as much as possible.	76	67.9
I am not sure.	36	32.1
I do not intend to use the tablet device to interact with the MOI through its e-Portal.	0	0

Information About tablets (n=81)		
Intervals	**Frequency**	**Percent**
Word of mouth from friends and family	63	77.78
Tablets stores	47	58
Media –TV, Radio and Newspapers	7	8.64
Magazines	3	3.7
Online social network	14	17.28
Professional technology review websites	3	3.70
Sales person	18	22.22

Consideration(s) when buying a tablet device (n=112)		
Intervals	**Frequency**	**Percent**
Appearance (such as colour or material)	22	19.64
Brand (such as Apple & Samsung)	75	66.96
Price of the tablet	107	95.5
Camera capabilities	35	31.25
Operating System (Such as iOS & Android)	27	24.11
Operating Speed	13	11.61
Screen Size	62	55.36
Screen Resolution	10	8.93
Weight	8	7.14
Battery life	2	1.79
Memory size	4	3.57
Quality of Applications (apps)	2	1.79
Price of Applications (apps)	3	2.68
Number of Applications (apps) available in the app Market	1	0.89
Support LTE (4G)	1	0.89

Reasons/s for not getting a tablet (n=510)		
Intervals	**Frequency**	**Percent**
I am too old for a tablet	158	30.98
It is too much of an effort to use a tablet	130	25.49
A tablet is too complicated and difficult to use	141	27.65
I do not think a tablet is useful	46	9.02
Physical discomfort or accessibility problems	10	1.96
The cost of using a tablet – I do not want to spend a lot of money when using a tablet	78	15.29
I just want to relax after my working hours	1	0.2
I do not know much about how to use a tablet	97	19.02
I have other devices such as a laptop that can function as well, or better than a tablet	136	26.67
Using a tablet does not fit with my lifestyle	6	1.18

Factors that may encourage future use of a tablet device (n=510)		
Intervals	**Frequency**	**Percent**
Reduce cost of a tablet	166	32.55
Free training	37	7.25
Reduce cost of monthly contracts	89	17.45
Nothing/ will never use a tablet in the future	340	66.67

Final Data Analysis

Sub-groups Analysis / Pre-seniors (50-59)

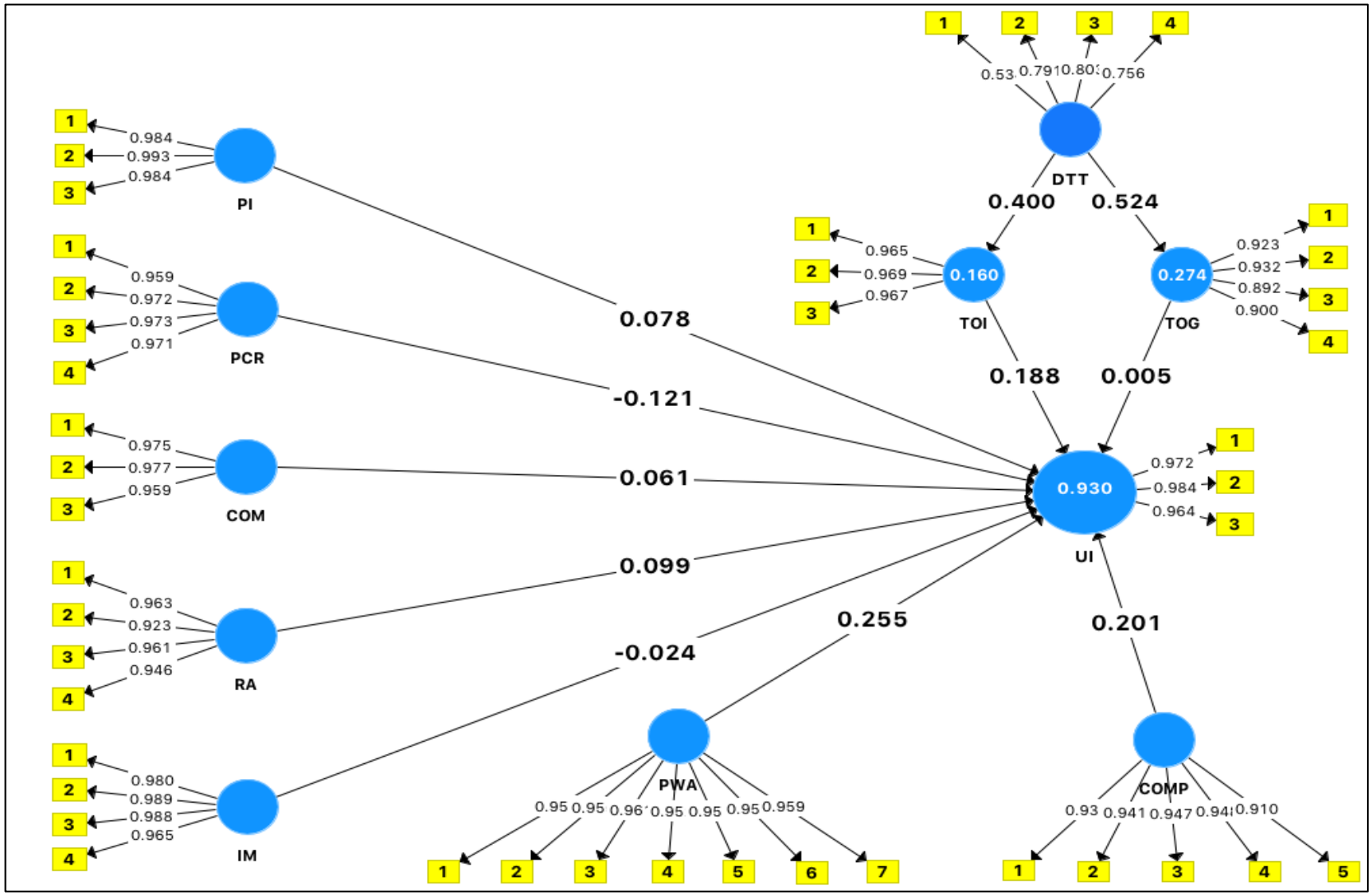
Table. Results of reliability analysis (50-59 participants)

Construct	Number of Items	Cronbach alpha1	Composite reliability2	AVE3
COM	3	0.969	0.980	0.941
COMP	5	0.964	0.972	0.875
DTT	4	**0.693**	0.816	0.532
IM	4	0.987	0.990	0.962
PCR	4	0.978	0.984	0.939
PI	3	0.987	0.991	0.975
PWA	7	0.984	0.987	0.913
RA	4	0.963	0.973	0.900
TOG	4	0.932	0.952	0.831
TOI	3	0.965	0.977	0.935
UI	3	0.972	0.982	0.947

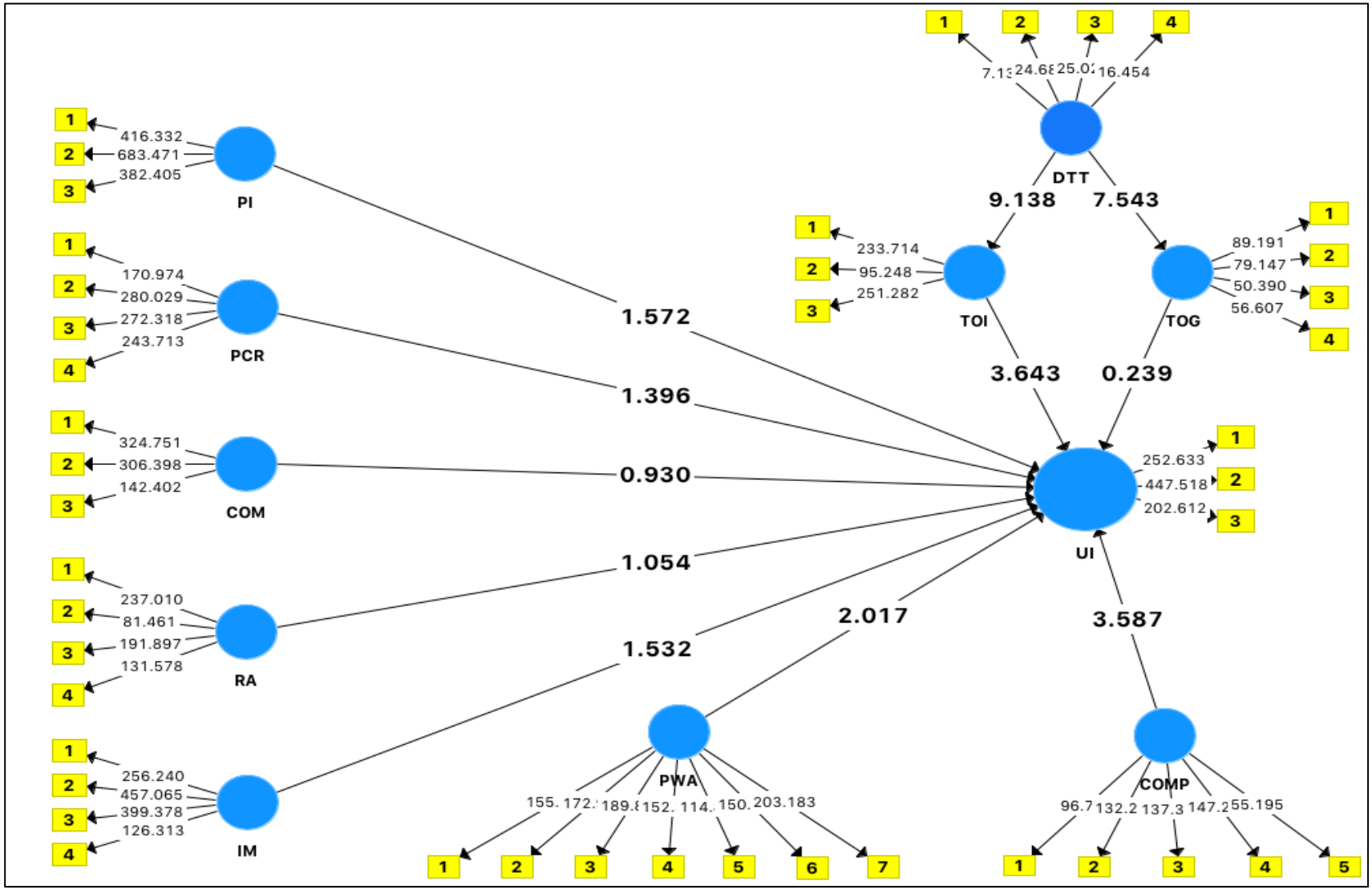
1= Satisfactory if >= 0.7 2= Satisfactory if >= 0.7 3= Satisfactory if >= 0.5

Table. Construct Cross-Correlation Matrix and AVE analysis - Diagonal numbers (in bold Italic) are the square roots of the AVE – 50-59 Participants

Construct	COM	COMP	DTT	IM	PCR	PI	PWA	RA	TOG	TOI	UI
COM	**0.970**										
COMP	0.867	**0.936**									
DTT	0.403	0.426	**0.729**								
IM	-0.168	-0.200	-0.089	**0.981**							
PCR	-0.847	-0.894	-0.450	0.231	**0.969**						
PI	0.838	0.887	0.389	-0.197	-0.863	**0.987**					
PWA	0.885	0.917	0.419	-0.224	-0.922	0.893	**0.956**				
RA	0.926	0.895	0.382	-0.153	-0.866	0.867	0.923	**0.949**			
TOG	0.566	0.558	0.524	-0.134	-0.547	0.548	0.584	0.608	**0.912**		
TOI	0.829	0.860	0.400	-0.200	-0.859	0.844	0.901	0.865	0.620	**0.967**	
UI	0.884	0.924	0.471	-0.229	-0.911	0.892	0.944	0.913	0.590	0.905	**0.973**



Path Analysis (50-59)



Bootstrapping Analysis (50-59)

Sub-groups Analysis / Seniors (60+)

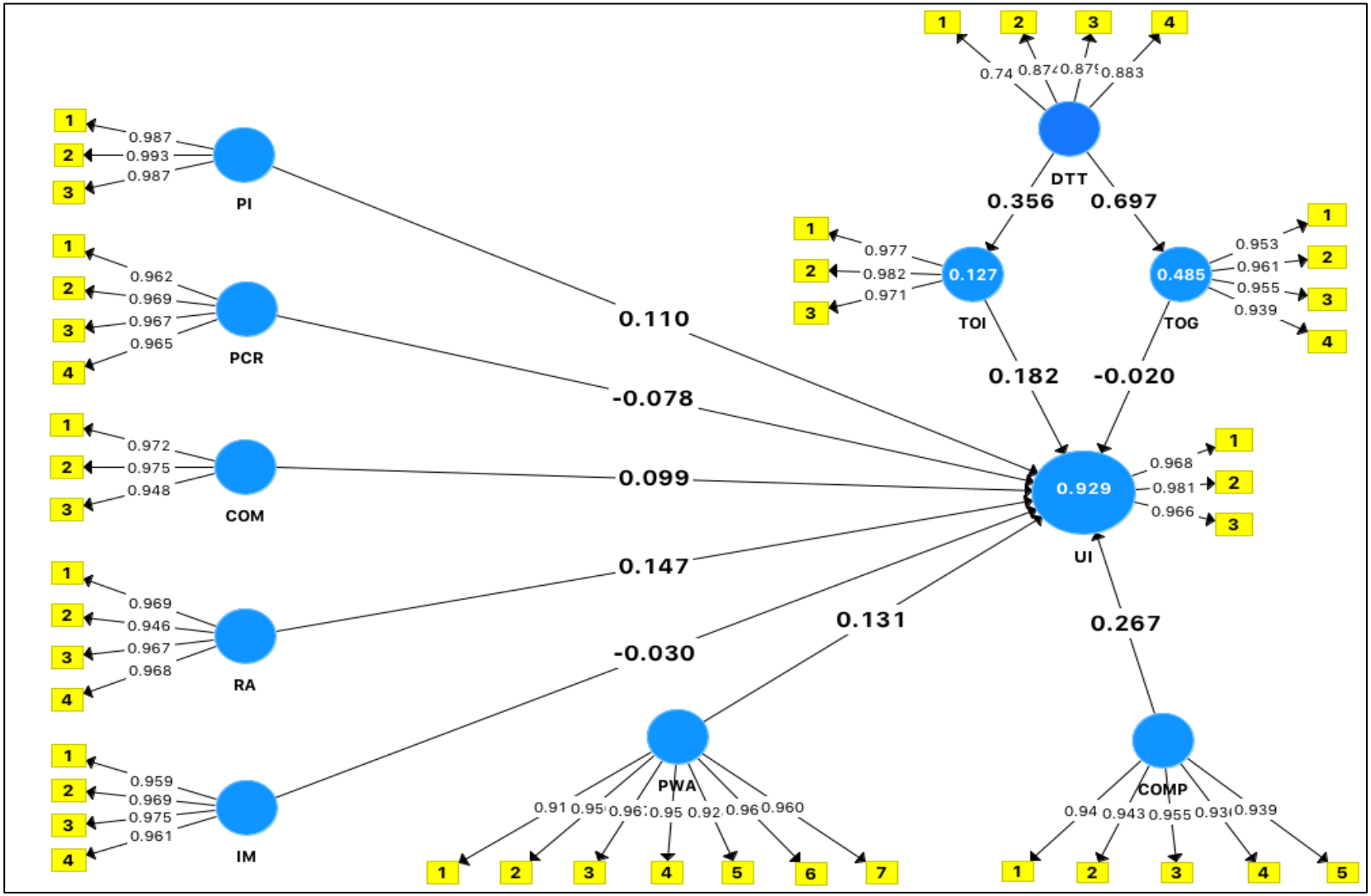
Table. Results of reliability analysis (60+ participants)

Construct	Number of Items	Cronbach alpha1	Composite reliability2	AVE3
COM	3	0.963	0.976	0.931
COMP	5	0.969	0.976	0.889
DTT	4	0.866	0.909	0.716
IM	4	0.977	0.983	0.934
PCR	4	0.976	0.982	0.932
PI	3	0.989	0.993	0.978
PWA	7	0.981	0.984	0.899
RA	4	0.974	0.981	0.927
TOG	4	0.966	0.975	0.907
TOI	3	0.976	0.984	0.955
UI	3	0.970	0.981	0.944

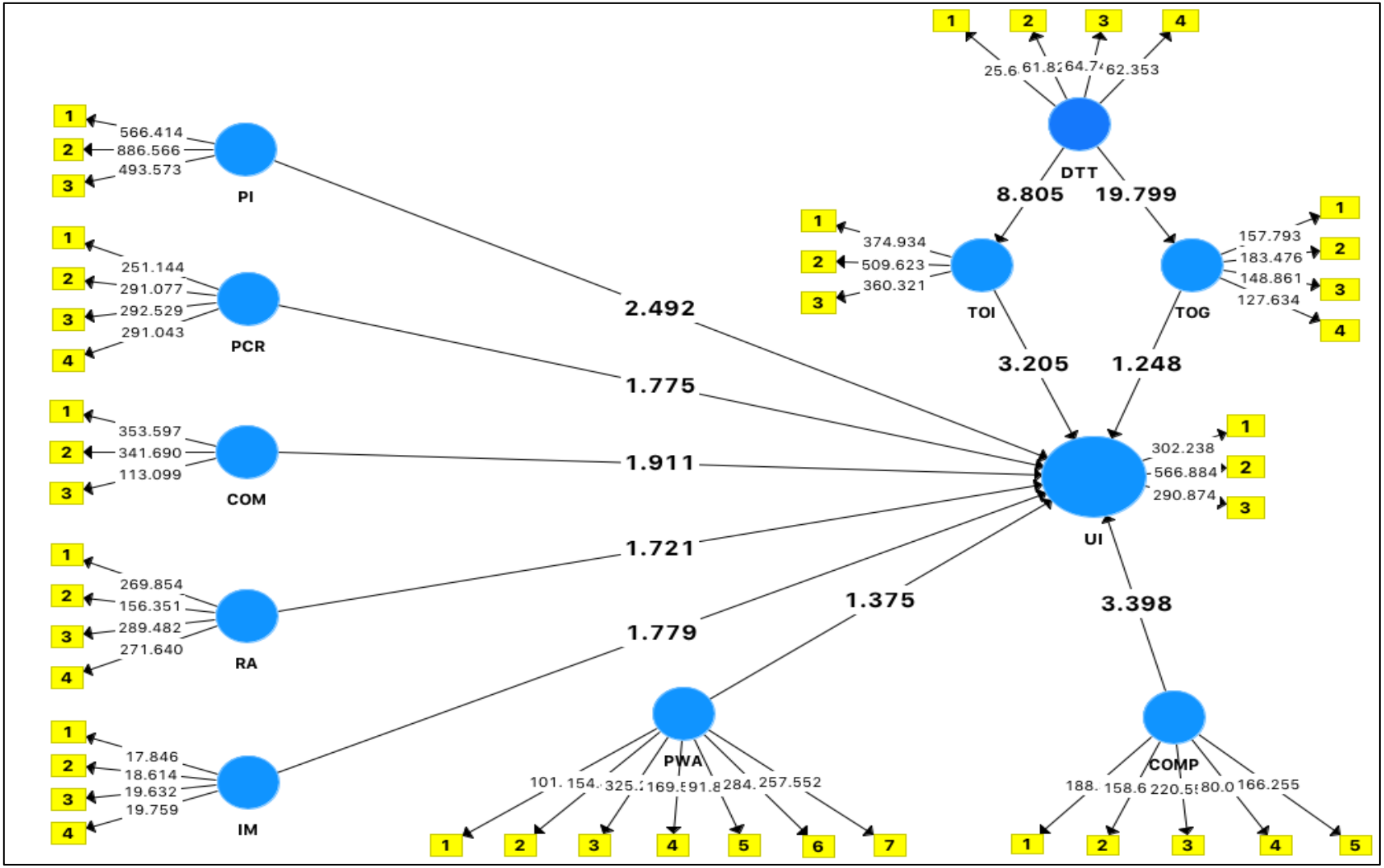
1= Satisfactory if >= 0.7 2= Satisfactory if >= 0.7 3= Satisfactory if >= 0.5

Table. Construct Cross-Correlation Matrix and AVE analysis - Diagonal numbers (in bold Italic) are the square roots of the AVE – 60+ Participants

Construct	COM	COMP	DTT	IM	PCR	PI	PWA	RA	TOG	TOI	UI
COM	***0.965***										
COMP	0.886	***0.943***									
DTT	0.353	0.360	***0.846***								
IM	-0.118	-0.123	-0.247	***0.966***							
PCR	-0.807	-0.860	-0.360	0.127	***0.966***						
PI	0.851	0.902	0.311	-0.129	-0.844	***0.989***					
PWA	0.875	0.934	0.309	-0.110	-0.872	0.909	***0.948***				
RA	0.914	0.946	0.378	-0.134	-0.858	0.900	0.928	***0.963***			
TOG	0.470	0.477	0.697	-0.162	-0.445	0.435	0.449	0.479	***0.952***		
TOI	0.871	0.906	0.356	-0.128	-0.843	0.877	0.906	0.904	0.513	***0.977***	
UI	0.894	0.941	0.327	-0.153	-0.869	0.907	0.931	0.937	0.464	0.918	***0.972***



Path Analysis (60+)



Bootstrapping Analysis (60+)

Final Sub-groups Analysis / Female Participants

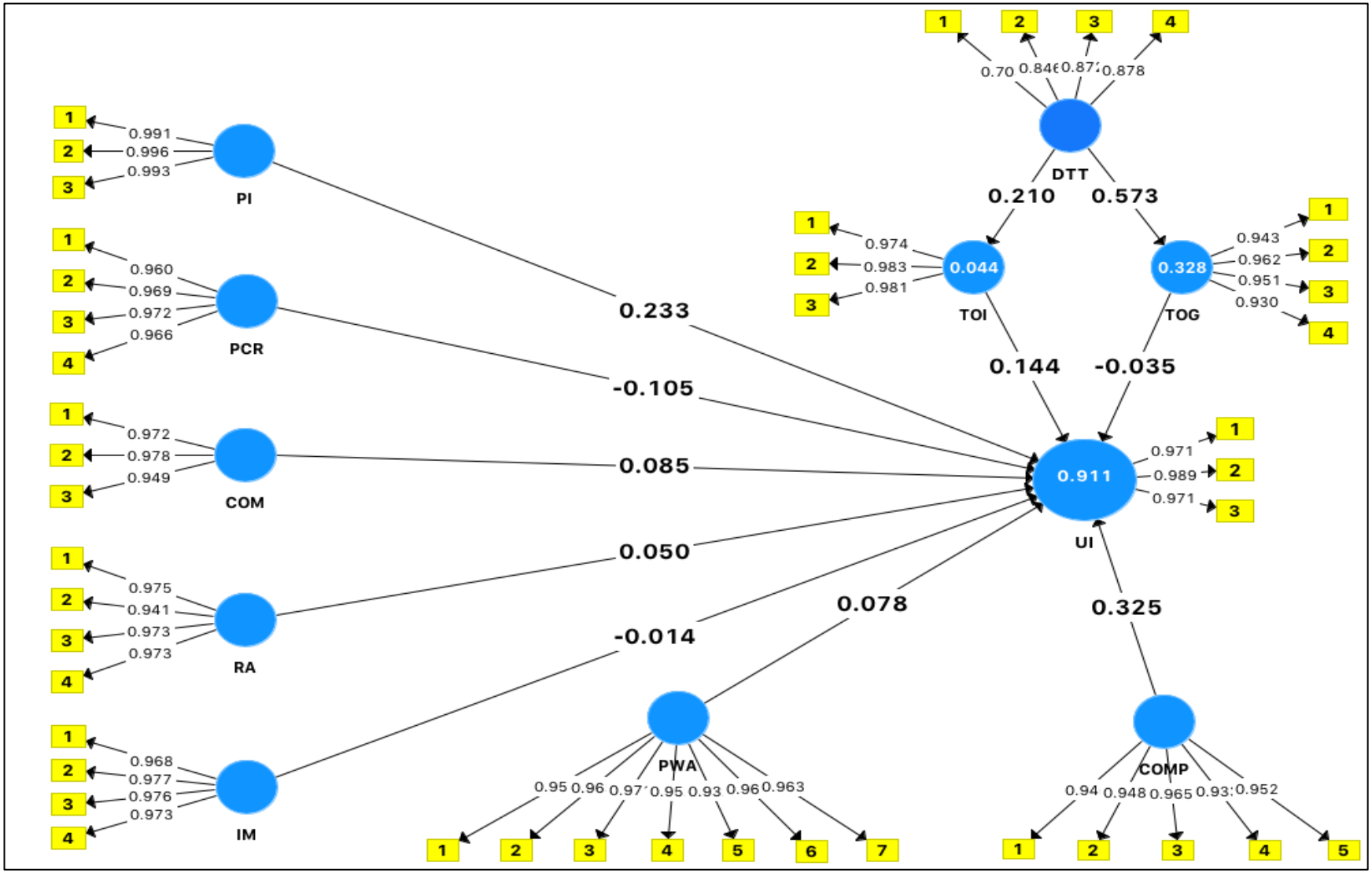
Table. Results of reliability analysis (Female participants)

Construct	Number of Items	Cronbach alpha1	Composite reliability2	AVE3
COM	3	0.964	0.977	0.934
COMP	5	0.972	0.978	0.900
DTT	4	0.843	0.896	0.685
IM	4	0.983	0.987	0.948
PCR	4	0.977	0.983	0.935
PI	3	0.993	0.995	0.987
PWA	7	0.985	0.987	0.917
RA	4	0.976	0.982	0.933
TOG	4	0.961	0.972	0.896
TOI	3	0.979	0.986	0.959
UI	3	0.976	0.984	0.955

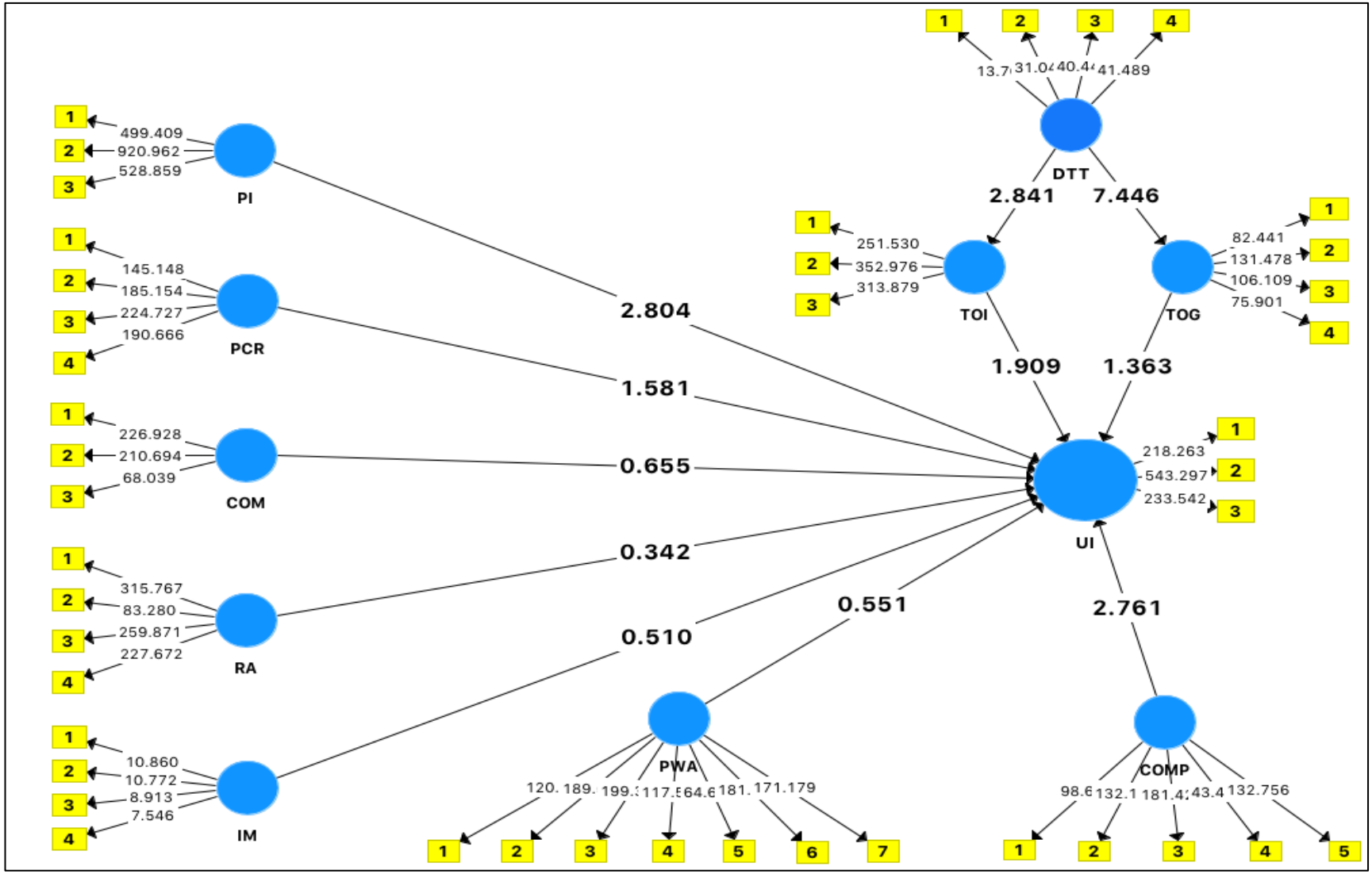
1= Satisfactory if >= 0.7 2= Satisfactory if >= 0.7 3= Satisfactory if >= 0.5

Table. Construct Cross-Correlation Matrix and AVE analysis - Diagonal numbers (in bold Italic) are the square roots of the AVE – Female Participants

Construct	COM	COMP	DTT	IM	PCR	PI	PWA	RA	TOG	TOI	UI
COM	**0.966**										
COMP	0.888	**0.949**									
DTT	0.298	0.286	**0.828**								
IM	-0.028	0.002	-0.201	**0.974**							
PCR	-0.819	-0.858	-0.261	0.052	**0.967**						
PI	0.871	0.916	0.242	-0.012	-0.841	**0.993**					
PWA	0.886	0.915	0.149	0.014	-0.834	0.896	**0.958**				
RA	0.950	0.905	0.250	-0.035	-0.795	0.876	0.884	**0.966**			
TOG	0.430	0.380	0.573	-0.053	-0.307	0.351	0.383	0.401	**0.946**		
TOI	0.851	0.853	0.210	-0.014	-0.806	0.849	0.893	0.836	0.406	**0.979**	
UI	0.887	0.930	0.253	-0.025	-0.860	0.917	0.906	0.889	0.348	0.873	**0.977**



Path Analysis (Female Participants)



Bootstrapping Analysis (Female Participants)

Final Sub-groups Analysis / Male Participants

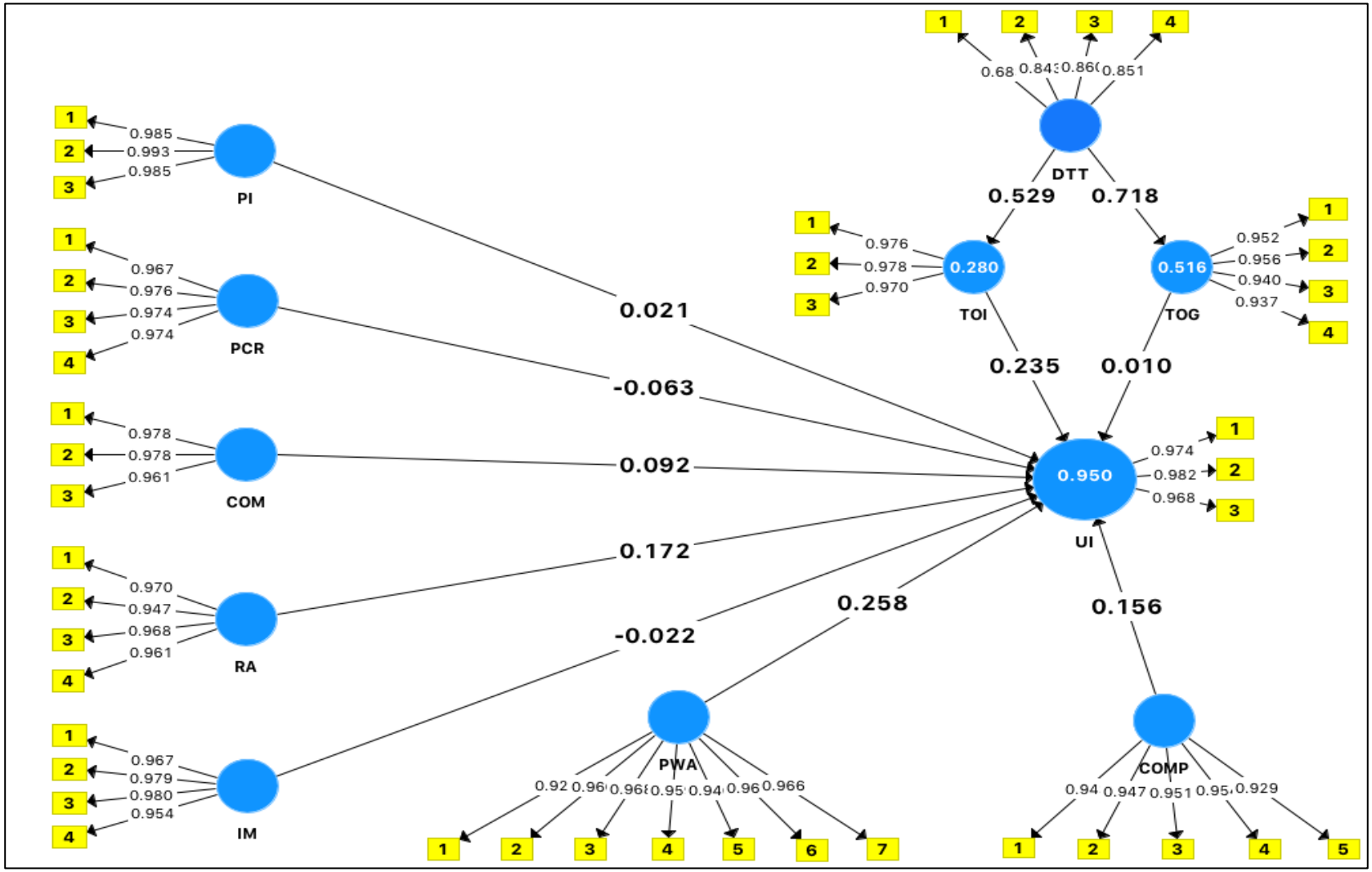
Table. Results of reliability analysis (Male participants)

Construct	Number of Items	Cronbach alpha1	Composite reliability2	AVE3
COM	3	0.971	0.981	0.945
COMP	5	0.970	0.977	0.893
DTT	4	0.824	0.885	0.660
IM	4	0.979	0.985	0.941
PCR	4	0.981	0.986	0.946
PI	3	0.987	0.992	0.975
PWA	7	0.984	0.987	0.914
RA	4	0.973	0.980	0.925
TOG	4	0.961	0.972	0.895
TOI	3	0.974	0.983	0.950
UI	3	0.974	0.983	0.950

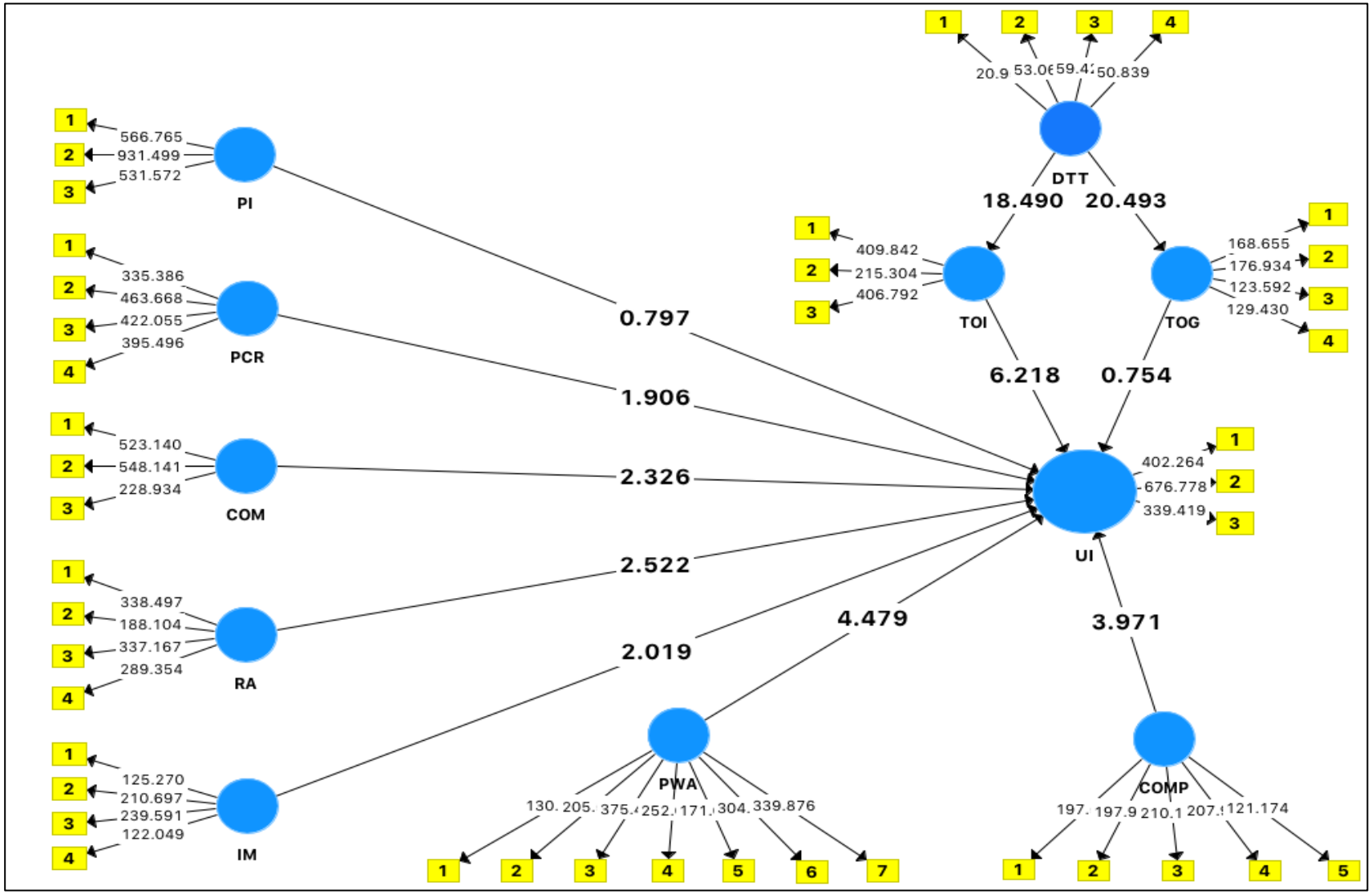
1= Satisfactory if >= 0.7 2= Satisfactory if >= 0.7 3= Satisfactory if >= 0.5

Table. Construct Cross-Correlation Matrix and AVE analysis - Diagonal numbers (in bold Italic) are the square roots of the AVE – Male Participants

Construct	COM	COMP	DTT	IM	PCR	PI	PWA	RA	TOG	TOI	UI
COM	**0.972**										
COMP	0.895	**0.945**									
DTT	0.501	0.526	**0.812**								
IM	-0.094	-0.113	-0.179	**0.970**							
PCR	-0.856	-0.902	-0.538	0.129	**0.973**						
PI	0.858	0.900	0.483	-0.108	-0.877	**0.988**					
PWA	0.897	0.942	0.534	-0.129	-0.931	0.915	**0.956**				
RA	0.922	0.945	0.533	-0.094	-0.908	0.906	0.954	**0.962**			
TOG	0.620	0.642	0.718	-0.169	-0.631	0.613	0.633	0.656	**0.946**		
TOI	0.878	0.918	0.529	-0.131	-0.890	0.888	0.924	0.926	0.680	**0.975**	
UI	0.909	0.945	0.535	-0.141	-0.916	0.905	0.956	0.953	0.660	0.942	**0.975**



Path Analysis (Male Participants)



Path Analysis (Male Participants)