

**Curtin Business School
School of Information Systems**

**Modeling end-user adoption of e-government services in Abu
Dhabi**

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Doctor of Philosophy
of
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Declaration

To the best of my knowledge and belief, this thesis contains no material previously published by any other person except where due acknowledgment has been made. This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

The research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2007) – updated March 2014. The proposed research study received human research ethics approval from the Curtin University Human Research Ethics Committee (EC00262), Approval Number IS_10_15 (20 October 2010) and IS_14_06 (24 February 2014).



Signature:

Date: ...11/07/2016.....

Abstract

A number of recent reports indicate that several governments around the world are increasingly using internet technologies to provide public services. These services range from providing the most basic informational website to deploying smart government services using sophisticated tools for managing interactions between government agencies and beyond government. This has resulted in the development of many e-government initiatives that aim to enhance the delivery of government services to citizens and improve interactions with business and industry. The e-government initiatives in various countries have focused on replacing their traditional government services with 'online' alternatives. To accomplish this, governments have spent a lot of money to create the technology infrastructure required to enable end-users to access a variety of online services.

A number of studies have examined the supply-side of e-government; however, it is evident from the available literature that very few researchers have investigated the demand for e-government services from the perspective of the end-users. Further, the literature on technology adoption indicates that the perceptions and attitudes of potential adopters' regarding new innovations are critical to the successful acceptance of these innovations. The aim of this research project is to examine the factors that influence the uptake of e-government services by end-users in Abu Dhabi.

This project was completed in two phases. In the first phase, the researcher used a qualitative approach to collect data from the study participants using two rounds of semi-structured interviews. A sample of Abu Dhabi residents were interviewed in order to determine the critical factors that influence their use (or lack of use) of e-government services. Drawing on existing technology adoption literature and models (such as DOI, TAM & UTAUT) and the findings from the qualitative phase, a theoretical model that summarizes the six domains that emerged as a result of using the qualitative research approach, as well as the relationships between these domains,

was developed. The discovered domains were: Perceived Online Safety, Online Experiences, Individual Significant Others, Motivations, Trust and Intention to Use.

The second phase of the study used a quantitative research method to assess the study hypotheses formulated after completing the qualitative phase. During the quantitative phase, a survey instrument was developed, tested and validated before it was used to collect data from a cross-sectional sample of Abu Dhabi residents. The quantitative data was then analyzed using Structural Equation Modelling techniques. The results obtained confirmed that Online Experiences and Individual Significant Others are significant factors in predicting end-users' acceptance of e-government, explaining 54% of the variance. The results also indicate that Trust is not a significant factor, contrary to findings in prior literature.

Finally, by providing insights into end-users' perceptions of e-government services, the findings of this study contribute to the literature on e-government adoption which has hitherto been limited, especially in a non-western context. The study also contributes a "grassroots" and validated e-government adoption model. The findings of this study will be useful to both e-government researchers and practitioners interested in promoting e-government.

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1. CHAPTER ONE: INTRODUCTION

1.1 Study Objectives

Recently, the number of individuals using the Internet has reached unprecedented heights. In 2015, the International Telecommunication Union (ITU¹) reported that 3.2 billion people across the world were connected to the Internet; this figure exceeded the expectations of even the most optimistic experts (ITU, 2015). This large number of people who are now connected to the Internet has been noticed by many governments around the world along with the enormous development opportunities that it brings. As a result, governments have started to invest heavily in the ICT infrastructure required to bring their services online.

The World Bank reports that e-government initiatives have the potential to transform government relations with citizens, businesses, and other arms of government (World Bank, 2006). Furthermore, these initiatives can enhance service delivery to businesses in many ways. For example, services such as business registrations and license applications, inspection clearances, customs modernization, tax administration and procurement of goods and services can all be improved by making them easily accessible and convenient via Internet technologies. However, West (2004) argues that e-government initiatives have fallen short of their potential to transform service delivery and improve public trust in government.

The Research Markets 2009 annual report, which provides a comprehensive overview of the trends and developments in the telecommunication and digital media markets in the UAE (United Arab Emirates), states that the UAE governments, both federal and emirate (state), have made considerable investments in e-government projects (Research Markets, 2009). In order for these projects to fulfill their potential, end-users' participation is required. Therefore, achieving end-users' uptake of e-services

¹ The United Nations specialized agency for Information and Communication Technologies (ICTs).

has become a critical success factor for e-government initiatives (Carter and Belanger, 2004).

However, despite the importance of end-user uptake, a considerable amount of the academic literature on e-government focuses on the supply side of e-government services. This includes studies on: the models of e-government evaluation and practices (Reddick, 2004; West, 2004); effectiveness of implementation and challenges of e-government services (Jaeger and Thompson, 2003); success factors and implementation of E-government initiatives (Jaeger, 2003; Traunmüller, Wimmer, 2003 and Yonazi, 2010). According to, Kunstelj, Jukic, and Vintar (2007) limited number of studies investigate the demand side of e-government, especially in the context of developing countries, focusing on the level of e-services usage and the factors that influence users' acceptance of e-government . This sentiment was echoed by Bwalya and Zulu (2012) who stated that "The [e-government] literature is full of supply side of e-Government projects but very little research has been done on the demand side" (p. 38). In addition, Kabbar and Dell (2012) stated that demand for e-government services received little attention compared to research focusing on provision of these services.

Hence, the current study focuses on demand-side adoption of e-government services in a developing country. The aims of this study are to enhance knowledge of e-government acceptance and to propose a theoretical model that further explains the factors that influence end-users' acceptance of e-government. The study objectives are as follows:

1. To understand end-users' perceptions of electronic interaction with government agencies in Abu Dhabi;
2. To examine the factors that influence end-users' utilization (or lack of utilization) of e-government services in Abu Dhabi;
3. To develop an e-government adoption model and to empirically test and validate it.

Finally, the location chosen for this investigation into end-users' use of e-government services is Abu Dhabi, the capital of the United Arab Emirates. The following section provides an introduction to the study location.

1.2 The Study Location

This study is conducted in the capital city of the United Arab Emirates (UAE) Abu Dhabi and is located in the emirate of Abu Dhabi, one of the seven states (emirates) of the UAE.

The UAE was established in December 1971 as a constitutional federal state by Sheik Zaid bin Sultan Al Nahyan. Abu Dhabi and Dubai are the largest states in terms of area and population. Data released by the UAE Ministry of Economy in 2007 reveal that the UAE has a total population of 4.48 million, 3.62 million of whom were expatriates (80.8%) while only 864,000 were UAE nationals (19.2%), up from 3.39 million foreigners (80.1%) and 839,000 nationals (19.9%) in 2006. At the end of 2007, Abu Dhabi was the most populated emirate in the UAE, with a population of just under 1.5 million, followed by Dubai, with 1.48 million people, and Sharjah, with a little under 882,000 people (Sambidge, 2008). Most UAE expats come from South East Asia, the Middle East and Western countries (including USA, UK, Europe, Australia and New Zealand).

The UAE federal e-government strategy vision, formulated in 2009, aims at establishing:

“A world-class government that provides its communities with the best access to knowledge and services in the most efficient, effective and economic way.”
(UAE Government, 2009)

In order to achieve this vision, the e-government strategy relies on e-government technologies and channels. The strategy also works towards creating a knowledge-based economy in which ICTs become part of the daily work and lives of the public in their businesses, schools, public administration and service industries. The strategy

focuses on the importance of deploying enterprise-wide IT initiatives by government to manage and share information and knowledge as a key condition in realizing the e-government vision. However, for communities to embrace this vision and participate in the knowledge economy, they must have the skills required and the motivation to access government services through e-government technologies and channels.

Kostopoulos (2004) believes that the UAE leads the Gulf countries when it comes to providing e-government services. The UAE has a large number of high tech initiatives that range from enabling tourists to complete visa applications online to sending “up to the minute traffic reports” to motorists via SMS from police department systems. The UAE e-government provision leadership has also been recognized by the United Nations (UN). According to the most recent UN e-government survey, the UAE has been ranked among the top gulf countries in almost all the survey development indicators. According to the UN report, the UAE is ranked 14th in Online Service Index (OSI), 29th in the E-Government Development Index (EGDI), and 32 in the E-Participation Index (EPI) (UNDESA 2016).

The figures provided in these reports clearly show that the UAE government is committed to providing the infrastructure needed to deliver government services online. However, despite the availability of such high tech e-government services in the UAE, little is known about the level of e-services usage by citizens and residents or the motivations for users to take up these services or not. Limited research has been conducted into the use of e-government services in the Arab region (Al-Shafi, 2009) and those factors influencing end-users to accept these services. As a result, this study is conducted to provide a better understanding about e-government acceptance in the UAE, particularly in Abu Dhabi.

1.3 Thesis Structure

This final introductory section provides an overview of the structure of the dissertation, which is organized into six chapters. This introductory chapter provides

the reader with the theoretical research background, rationale and location of the study. In addition, the chapter provides details about the background of this study, focusing on the current status of e-government research and how the research has been dominated by supply-side literature. The chapter also includes a review of background information about Abu Dhabi – the context of this study. Finally, the chapter provides the reader with an overview of the thesis structure.

Chapter Two provides an overview of the different theoretical models that explain technology adoption and acceptance. In addition, the chapter reviews current e-government adoption models and their limitations, concluding with an identification of the research gap addressed by this study.

Chapter Three of the thesis presents the mixed research methods used in this study. It gives a detailed description of the qualitative and quantitative methodological approaches adopted during the first phase and second phase of this study respectively. In addition, the chapter highlights the ethical considerations observed during the course of the study.

Chapter Four explains in detail the qualitative approach used in this study, and describes the environment in which the semi-structured interviews took place, the qualitative data collection process and procedures, and the data analysis technique that was used. The chapter concludes by presenting the conceptual model obtained at the end of the qualitative phase of the study which explains the main factors that influence end-users' adoption of e-government services in Abu Dhabi.

Chapter Five explains the quantitative approach that was adopted for the second phase of the study. Also included are: the study hypotheses; the development and validation of the instrument used for data collection; and a description of the sample used for the data collection during this phase of the study. The chapter also describes the statistical method used to analyze the survey data and the results obtained revealing whether or not the hypotheses proposed in this study were supported.

Finally, Chapter Six discusses the study findings from which several conclusions are drawn. It discusses the contribution made by this study, and addresses its limitations and implications. Moreover, this concluding chapter suggests future research directions and opportunities arising from the findings of this study.

2. CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section reviews the major theoretical frameworks that explain the adoption of technology, highlighting the theoretical constructs, including their strengths and limitations. This is followed by a review of the few theoretical models that have been developed to explain the factors influencing e-government adoption. The research gap that is addressed by this study is identified at the end.

An international study titled Benchmarking the Information Society in European Regions (BISER) examined the usage of e-government services in 28 European regions (from 14 EU Member States), and concluded that “Generally, the population’s usage of e-government services is very low” (Lassnig and Markus, 2003 p. 145). In addition, the study also discovered that most of the EU citizens “for whatever reason” prefer to deal with government using traditional methods of communication. Further, an OECD e-government studies conducted in 2009 concluded that despite the initial exceptional acceptance of e-government services in OECD countries, governments later observed low adoption and low use of e-services (OECD, 2009).

In addition, a more recent international e-government study stated that “governments are making service investment decisions without a clear view of the outcomes they effect” (Accenture, 2005, p.9).

Furthermore, Lau (2003) indicated that e-government should be driven by the value it adds to the service level provided to citizens rather than by ICT’s developments. He argued that simply using new technologies to digitize the available information and make it available online would not transform government and bring the promised benefits of e-government, such as improved and more accessible services by citizens, greater public access to information, and more efficient and cost-effective government. Rather, the challenge is to understand how modern technology can be

used to transform government process, culture and structure in order to provide better services to citizens.

Similar to the trend in academic research, e-government initiatives success has been determined from the supply side. Moore (2005) argue that the success of e-government services has been assessed by measuring the maturity level of a government's e-service (that is, the extent to which a government has developed an online presence). Furthermore, he states that there are problems with using the service maturity calculations because they do not measure the usage of these services, and the quality of the user experience. He further suggests that the fundamental measure of the success of service delivery should be the actual adoption of services and how governments turn that adoption into value. This argument further emphasizes the importance of e-government services adoption as a critical success factor for e-government initiatives.

Egger (as cited in Kunstelj, Jukic, & Vintar, 2007) agrees with Moore's suggestions, stating that "[t]he dark side of e-government isn't cost overruns, turf battles of integration issues; it's low adoption rates. Without customers, the public sector can't justify large investments in e-government for much longer" (p. 315).

A limited number of studies have investigated the demand side of e-government services. Botterman et al. (2003) studied the demand side of e-government in Switzerland, the US, and a number of EU countries. Their research concluded that there is a variation in individuals' attitudes toward e-government from one country to another. They also called for more in-depth-investigation in order to understand the regional variations in the acceptance of e-government.

Similar results have been shown in Lassnig and Markus' (2003) study which investigated the usage of e-government in Europe. Their study revealed that there are significant differences in the usage of e-government services between various European regions.

Tung and Rieck (2005) also examined the demand side of e-government. The objective of their study was to better understand the adoption of e-government services by business organizations in Singapore. The study results revealed that the firm's decision to adopt e-government services is determined by the: perceived benefits of the services, external pressure and social influence.

Given that adoption and acceptance are critical to the success of e-government deployment and hence to this study, it is important to review the theoretical landscape regarding technology adoption, and the adoption of e-government specifically. Such a review is presented in the following sections.

2.2 Theoretical Frameworks Review

The technology adoption and acceptance research domain is a constantly developing field as new technologies and innovations are introduced all the time. While the supply-side / organizational adoption of technology can be explained using the Technology-Organization-Environment (TOE) framework proposed by Tomatzky and Fleischer (1990), this study looks at demand-side/end-user adoption; hence, TOE is not reviewed here.

Two fields, psychology and sociology, have provided a number of theoretical frameworks for the exploration of the demand side of adoption. The Diffusion of Innovation theory (DOI) proposed by Rogers (1962), Theory of Reasoned Actions (TRA) postulated by Ajzen and Fishbein (1967), the Social Cognitive Theory (SCT) proposed by Albert Bandura (1986), have influenced a significant amount of the Information Systems literature. For instance, the Technology Acceptance Model (TAM), developed by Fred Davis (1986), and the Unified Theory of Acceptance and Use of Technology, posited by Venkatesh et al. (2003), are good examples of user-intention-based models that were derived from the previous models.

Further, a number of studies have used these frameworks to study users' behaviour in the e-government context. Despite the fact that UTAUT is a well-established, robust

model; a number of research studies that applied UTAUT in an e-government context, particularly in a non-western context, yielded mixed results.

2.2.1 Diffusion of Innovation Theory (DOI)

DOI theory (Rogers, 1962) is considered as one of the most popular models that describes the process of adopting new innovations (Sherry and Gibson, 2002). According to Rogers (2003), one of the reasons why there is interest in DOI is that it is difficult for a new idea to be accepted even when it has proven benefits.

DOI has been used as the theoretical framework guiding many studies in different sectors such as public health, communications, history, economics, technology, and education. Although DOI is not specific to ICTs, it has been widely used to guide the technology adoption studies as well as promoting new technological products (Batty, Dobrovolny, Sherry, Ryder, & Wilson, 2002; Rhee & Kim, 2004; Tetiwat & Huff, 2002). In addition, the DOI theory has been used in a number of studies as the theoretical framework underlying many technology diffusion and technology acceptance studies (Dooley (1999) and Stuart (2000)).

Rogers defines Diffusion of Innovation as “the process in which an innovation is communicated through certain channels over time among the members of a social system” (2003, p. 5). The purpose of the DOI is “to provide individuals from any discipline interested in the diffusion of an innovation with a conceptual paradigm for understanding the process of diffusion and social change” (Daniels, 2006).

Rogers (2003) proposed a linear model that comprised of five different stages/processes to identify and explain the steps individuals follow, over a period of time, before they decide either to accept or reject the innovation as shown in Figure 2-1.

The first stage of the process is **Knowledge**. At this stage an individual (or a group) gets to know about the existence of an innovation for the first time, its possible usage

and functionality through communication channels. The Knowledge stage can be classified into different three types:

First, ***Awareness-knowledge***: this is where individuals will pursue information that an innovation exists. This type of knowledge may result in motivating an individual to actively look for more information about the innovation such as exploring the benefits and shortcomings of the innovation. Obtaining such information often result in reducing the ambiguity associated with innovations; this leads to the second or third type of knowledge. Such information-seeking may also occur at a later stages of the process (i.e. at the persuasion and decision stages).

Second, ***How-to-knowledge***: this is where an individual starts seeking the information necessary to use an innovation properly. Rogers argue that this type of knowledge is a critical variable in the innovation decision process as lack of this knowledge leads to poor experience with the innovation at the trail stage leading to a low adoption rate of the innovation or to rejection and discontinuance. Therefore, it is critical for promoters of any innovation, particularly a complex innovation, to make such knowledge readily and easily accessible to potential adopters prior to trial.

Third, ***Principles-knowledge***: this is where individuals seek detailed information about the principles underlying the workings of an innovation. Rogers argued that potential adopters can possibly accept an innovation without gaining principles-knowledge, but there is a risk of misusing the innovation which may result in discontinuance at later stages of the adoption process. For the vast majority of end-users of e-government services, the first two types of knowledge arguably are the most important types as individuals do not need to have a functional knowledge about how an online government service works in order to use it.

Rogers argues that awareness-knowledge can be attained through mass media, and that how-to-knowledge can be assigned to change agents² who could play a pivotal

² The entity or individuals interested in promoting the innovation.

and central role at the trial /decision stage in the innovation-decision process. Rogers states that principles-knowledge is a more suitable task for educational institutes to handle rather than a task for the change agents.

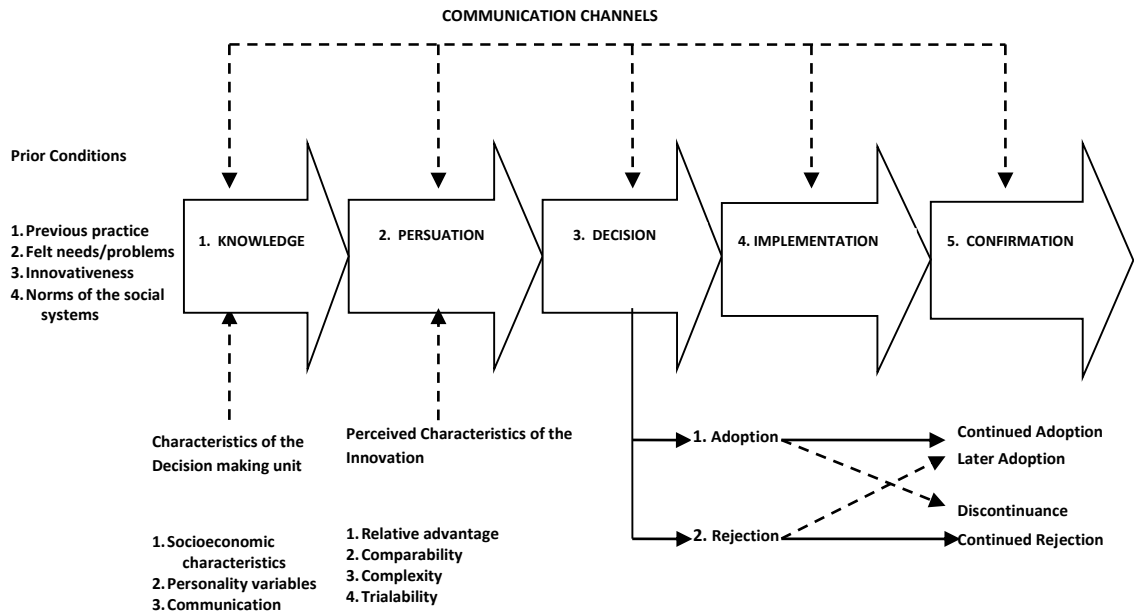


Figure 2-1: A model of Five Stages in the Innovation-Decision Process (Rogers, 2003)

Persuasion: at this stage individuals or groups formulate their own idea about the innovation. Prospective adopters develop either a positive or negative attitude towards the innovation. At this stage, the perceived characteristics of innovation described in Figure 2-1 (Simplicity, Trialability, Observability, Relative advantage and Compatibility) will significantly form the individual attitude towards the innovation. While Rogers acknowledges that individuals who formulate a favorable or unfavorable attitude toward an innovation do not end-up deciding immediately to adopt or reject an innovation, he argues that there is a tendency for attitudes and behavior to become more consistent.

Decision is the third step/stage in the innovation decision process. At this stage, an individual (or a group) decides to either accept and use of the innovation or reject it. This decision is based on the knowledge gained or the attitude he/she formulated during the earlier stages of the process. This decision can be overturned at a later stage where individuals who initially decided to adopt an innovation may decide to reject an innovation that they have adopted at an earlier stage, in such a case those individuals are known as 'discontinuance'. On the other hand, potential adopters who initially decided to reject an innovation at an earlier stage of the process could either continue with their rejection decision or they may decide to overturn their initial decision and adopt the innovation at a later stage to become 'Later Adopter'.

Once individuals decide to adopt an innovation, the fourth stage of the innovation decision (**Implementation**) begins. At this stage, individuals start the actual usage of the innovation. An individual's usage of an innovation may result in some changes or alterations to the original innovation during the adoption process which is referred to as reinvention.

The final stage of the process is referred to as **Confirmation**. At this stage, an individual (or a group) assesses his/her innovation usage, seeking evidence to support the continued use of the innovation. At this stage of the process an individual either confirms his/her initial decision to accept the innovation reverses their initial decision to adopt and as a result stop using the innovation. Rogers refers to the reversal of the initial decision to adopt the innovation as 'discontinuance'. Rogers (2003) identifies two types of discontinuance: first, replacement discontinuance where an adopter decide to reject an innovation and replace it with a better one that supersedes it. The second type is disenchantment discontinuance where an adopter decides to reject an innovation because he/she is dissatisfied with its performance.

In addition, Rogers (2003) identifies four key elements (Innovation Characteristics, Communication Channels, Time, and a Social System) that are critical in every

diffusion research study. The following section describe each of these elements in details.

2.2.1.1 Innovation Characteristics

In the context of the DOI the term ‘innovation’ refers to the perceived novelty of an innovation or technology product to the potential adopter rather than whether the innovation is actually new. Rogers (1995) mentioned that “If an idea seems new to the individual, it is an innovation” (p. 12) therefore, the characteristics of any innovation play a significant role in the potentials adopters’ decision to accept or reject an innovation. Rogers (2003) identifies five perceived innovation attributes that influence the innovation adoption rate. These attributes are:

- *relative advantage* refers to whether potential adopters perceive the innovation to be better than the product/idea they are currently using in terms of functionality, productively ...etc. In addition to whether there are any economic or social advantages that potential adopters avail by accepting and using the innovation;
- *simplicity* refers to potential adopters’ ability to use the innovation, and whether they perceive it to be simple enough to understand and maintain;
- *trialability* refers to the opportunity offered to potential adopters to try out the innovation on a limited basis, and whether the initial decision taken by potential adopters to adopt the innovation can be reversed without substantial cost;
- *observability* refers to the ability of potential adopters to observe the impacts of using the new innovation on others before they make their own adoption decision;
- *compatibility* refers to whether the innovation satisfies the basic needs of potential adopters’ and is in line with their social norms, values, and belief systems.

The adoption rate of innovations has been found to be negatively affected when they are perceived to be rather complex, difficult to reverse, have low observability, are

perceived as troublesome or irrelevant, and/or are incompatible with the potential adopter norms. Hence, the innovation characteristics described in this section can be used as a useful checklist to help both potential adopters and owners of innovations to predict innovations adoption rate. Rogers believes that the more characteristics an innovation has, the more rapidly the innovation will be adopted.

2.2.2.2 Communication Channels

Communication channels is the second element in the diffusion of innovation process. This element plays critical role in the diffusion of an innovation as they enable the innovation owners or promoters and potential adopters to share and exchange information about the new innovation. Mass media, interpersonal channels and interactive communication via the Internet are considered as the main three types of communication channels. The following section provides more details about each type.

Mass media channels: This type refers to a communication mode through which a number of individuals are able to convey a message to a large audience using one or more of the mass medium available (e.g. radio, television or newspapers). This communication channel is best used to introduce a new idea or innovation to possible future adopters.

The second type of communication channels focus on **Interpersonal channels**. This type refers to a mode of communication through which a number of individuals are able to have a conversation using face-to-face setting. While this type of communication channel may not be very efficient when introducing a new idea or an innovation to a large audience. This type is certainly a very powerful persuasion tool which can be used to persuade future adopters to accept a new idea or an innovation especially if the individuals concerned have common interests, beliefs, socio-economic status and/or educational background.

Interactive communication via the Internet: This mode of communication gathered huge momentum since it first appeared in the late 1980s to early 1990s, as it enabled individuals to exchange messages using Internet technology.

2.2.2.3 Time

This is the third element in the diffusion process. Rogers explains that effect of Time on the diffusion of innovation process using the following three different categories.

Adopter distribution over time

According to Rogers (2003), individuals can be classified into five types in terms of the degree of relative acceptance to an innovation over time. The types are: innovators, early adopters, early majority, late majority and laggards (see Figure 2-2).

Rogers observed that in a given population, 2.5 percent are **innovators**. This group is typically characterized by members who are adventurous by nature, eager to try new ideas and able to understand these new ideas even when they are technically complex. The innovators also have adequate financial resources enabling them to cope with the uncertainty that a new innovation brings with it; therefore, this group is considered as the ‘gatekeepers’ of an innovation.

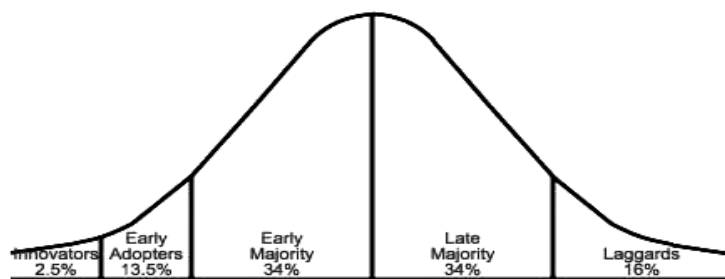


Figure 2-2: Adopter categorization based on innovativeness (Rogers, 2003)

The second group, **early adopters**, represents 13.5 percent of a given population. Members of this group are typically respectable individuals and opinion leaders, and are considered as role models within their community. They are the individuals from whom members of the social system seek to obtain information about the innovation.

Their approval of an innovation is sought after by change agents as it has a significant impact on the wider acceptance of the innovation.

Rogers refers to the third group of adopters as the **early majority** which represents 34 percent of a given population. Unlike the innovators and early adopters, members of this group take some time to adopt the innovation; hence, their decision to do so is considered as deliberate. However, they typically adopt the innovation before the average person in their social system. This is an important group in the innovation diffusion process as its members help to achieve the critical mass sought after by the change agents when they adopt an innovation.

The fourth group of adopters is referred to as **late majority**. Members of this group represent 34 percent of a given population. They are typically reluctant to adopt an innovation until most other people in their organisation or in their social circle have done so. Members of this group also tend to adopt an innovation after the average person in their social system adopts the innovation. Their adoption behavior is usually influenced by peer pressure (norm) or the perceived benefits of the adoption.

The last group in the adopters' category, the **laggards**, represents 16 percent of any given population. Members of this group are typically the last group in the social system to adopt an innovation because they tend to be suspicious of innovation and resistant to change. Usually, members of this group have limited financial resources and therefore cannot afford to adopt an innovation that might fail. Members of this group prefer to follow the traditional approaches rather than try new ideas; hence, they either reject the innovation outright or discontinue after initial adoption because of disenchantment.

Adoption Rate over time

This refers to the relative speed with which members of a societal group adopt an innovation. The rate of adoption is measured by calculating the time required for an innovation to be adopted by a certain number of a potential adopter's population.

Rogers observed that most innovations have an S-shaped rate of adoption as shown in Figure 2-3.

Change agents focus on convincing the opinion leaders to “buy into” the innovation and start to use the new idea. Once that happens, it is likely that the innovation will reach the Take Off stage where critical mass acceptance of the innovation would be achieved.

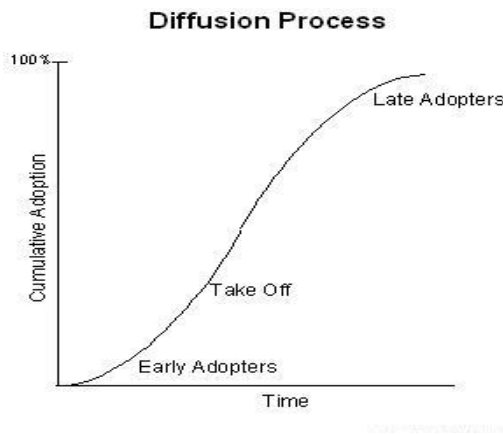


Figure 2-3: Diffusion Process (Rogers, 2003).

Social System

The final element of the diffusion process focuses on the social system surrounding the innovation. Social system is defined as a group of entities (group of individuals) facing similar problems or issues and are working towards a common goal. For most members of a social system, the decision to accept or reject an innovation is influenced heavily by the decisions taken by other members in the group.

The DOI has made significant contributions to better understanding the diffusion of innovation process, characteristics of innovation, adoption rates and adopters categories. However, despite this, several authors have criticized the DOI theory on the grounds that it does not explain how attitude evolves into an adoption or rejection decision (Karahanna et al., 1999; Chen et al., 2002).

Although Rogers' DOI framework is not specific to ICTs, it has been widely used to guide the theory and practice in the diffusion of new innovative technology products (Batty, Dobrovolny, Sherry, Ryder, & Wilson, 2002; Rhee & Kim, 2004; Tetiwat & Huff, 2002). According to Rogers (2003), one of the reasons for such interest in DOI is because getting a new idea adopted, even when it has obvious advantages, is difficult. However, much of the evidence for this theory, including the adopter categories, did not originate in the ICT context and it was not developed to apply specifically to the adoption of new technological innovations. According to Selwyn (2003) and Slowlowski & Jarratt (2007), technological innovation adoption is affected by the characteristics of the society in which potential users are embedded. They argue that understanding the relationships between users may be more critical than the attributes of the innovation itself (Brown and Duguid, 1991; Haggman, 2009). Further, Bruland (1995) states that resistance to technology is implicitly a study of the "interaction between the technology and its social context". Parker and Castleman (2009) argue that the DOI theory would have been more useful if the author had taken into consideration social contexts and they suggested that it would be useful for future studies investigating innovation adoption to integrate DOI with other theories. Further, the DOI focused on the innovation itself and its characteristics rather than on the individuals who use the innovation.

2.2.2 Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB)

2.2.2.1 TRA Key Assumptions and Theory Description

The TRA is regarded as one of the significant theoretical paradigms aiming to explain the relationship between attitudes and behaviors related to human action. The theory was developed in 1967 by Ajzen and Fishbein from the work they started in 1950 under the name of the 'Theory of Attitude'. The basic theoretical assumption of TRA is that human actions are based on assessing the information presented to them in a systematic approach which implies that individuals will assess the outcome of their

choices before deciding whether or not to engage in the behavior (Ajzen & Fishbein, 1980). In its simplest form, the TRA can be expressed as the following equation:

$$BI = (AB)W_1 + (SN)W_2$$

where:

BI = behavioral intention

(AB) = one's attitude toward performing the behavior

W = empirically derived weights

SN = one's subjective norm related to performing the behavior

TRA theorizes that the behavioral intention, which is referred to as the degree to which performance of behaviour is positively or negatively valued, of an individual is the key indicator of her or his actual behavior. The equation presented above shows that behavioral intention is a function of both an individual's attitude towards performing the behavior and her or his subjective norm. The proposed relationships between behavior intention and behaviors are shown in Figure 2-4.

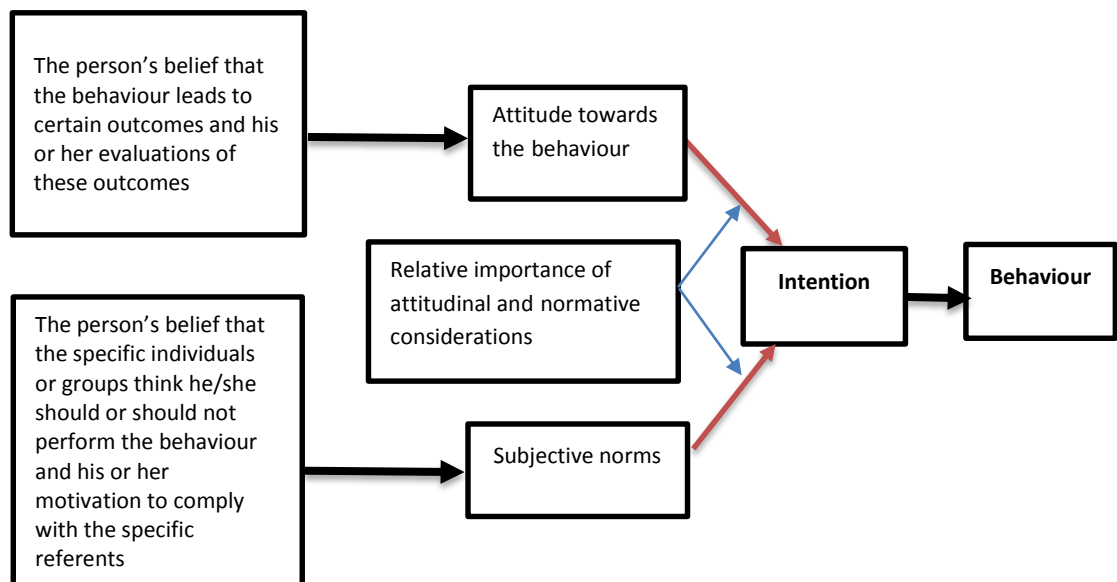


Figure 2-4 Factors determining a person's behaviour (Ajzen and Fishbein, 1980, p8)

Despite the contributions TRA made in explaining the relationship between individuals' behavioral intention and actual behaviour, the theory has been criticized for a number of reasons. One of the TRA issues of concern to researchers is that mixed results have been obtained in different studies regarding the effect of subjective norms on behaviour intention (Podder, 2010). To address this criticism, Ajzen (1985) extended the TRA by adding a new construct to develop the Theory of Planned Behaviour (TPB).

2.2.2.2 TPB Key Assumptions and Theory Description

Similar to the TRA, the key assumptions of the TPB is that an individual's behavioral intentions influence his or her actual behaviour. Icek Ajzen argues that the behavioral intention of an individual is influenced, in turn, by three constructs: his or her Attitude towards the Behaviour, Subjective Norms and Perceived Behavioral Control (PBC). Figure 2-5 shows the relationships between these constructs.

As shown in Figure 2-5, an individual's behaviour is considered to be a function of three constructs: human attitude towards the behaviour, the subjective norms surrounding the performance of the behaviour, and the behavioral control. Eagly and Chaiken (1993) summarized these constructs as follows:

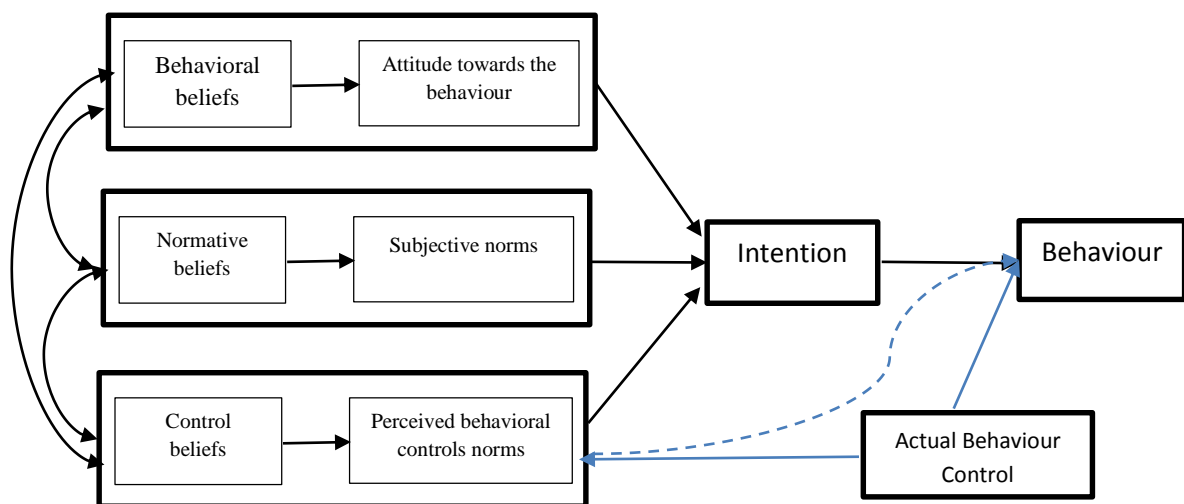


Figure 2-5 Theory of Planned Behaviour

Attitude toward behaviour refers to the degree to which an individual has positive or negative beliefs about performing the behaviour. Behavioral attitudes are determined through an assessment made by the individual regarding the outcomes of a certain behaviour and whether this will have a positive or negative effect on their lives. If the expected outcomes of performing the behaviour are positive, this is likely to create positive attitudes towards the behaviour, while negative expected outcomes are likely to produce a negative attitude towards the behaviour.

Subjective norm refers to an individual's perception of whether the social network (individual(s) or group(s)) around that individual think s/he should be engaged in the behaviour. In other words, an individual's behaviour is influenced by whether most people in the group would or would not approve of the behaviour (this is similar to the **Social Norms** component of the DOI presented in section 2.2.1).

Behavioral control refers to the individual's perception of the difficulty or ease of performing behaviour. According to Ajzen (1985), an individual's perceived behavioural control is determined by the total set of accessible behavioural controls as demonstrated by the following equation:

$$PBC = \sum_{i=1}^n C_i P_i$$

Where	<i>PBC</i>	stands for perceived behavioural control
	<i>C</i>	stands for control factors
	<i>P</i>	stands for power of the factor or belief strength.

The TPB assumes that the control people have over their behaviour falls within a range that extends from behaviors that are perceived as easily performed to those requiring considerable effort and resources.

Aizen (1985) argue that the success of an individual attempting to perform a behaviour depends on the efforts invested by the individual as well as his or her perceived control

over the resources needed to perform the behaviour, such as required information, skills, abilities, availability of equipment and so on. Therefore, an individual's behaviour depends not only on his or her favorable intention, but also on his or her adequate level of PBC.

Ajzen (1991) argues that the PBC concept is synonymous with the concept of self-efficacy proposed by Bandura (1977, 1982). Bandura refers to self-efficacy as an individual's belief in his or her ability to perform behaviors necessary to produce specific performance attainments. In other words, self-efficacy is concerned with an individual's judgment of his or her ability to execute the actions required to achieve a certain goal. Ajzen acknowledges that the systematic research program conducted by Bandura and associates influenced the development of the PBC concept. He also acknowledged that the PBC concept is not inclusive to the TPB and that comparable concepts to that of PBC are found in other models such as the model of interpersonal behaviour proposed by Triandis (1979).

However, Ajzen's assumption about the similarity between self-efficacy and PBC has been questioned by a number of researchers. For example, Armitage and Conner (2001) disagreed with Ajzen's views about the overarching overlap between self-efficacy and PBC, and they stated that the two concepts are not completely synonymous. Further, they presented evidence from Bandura (1992), cited in Armitage & Conner (2001), who stated that control and self-efficacy are actually quite different concepts. Bandura (1992) pointed that self-efficacy is more related to a person's perception about his/her cognitive control, whereas PBC echoes more general external factors. In addition, a number of other researchers supported Armitage and Conner's views regarding the distinction between the two concepts (e.g., Terry, Hogg and White 1994; Terry and O'Leary, 1995; and Manstead & Van Eekelen, 1998). In addition, some researchers raised questions about the labels associated with the PBC concept and its measurability (Leach, Hennesy, and Fishbein, (2001); Trafimow and Duran, (1998) (cited in Kraft, Rise, Sutton, and Røysamb, 2005)).

In his later work, Ajzen (2002) addressed some of the criticism associated with the issues related to the measurement of PBC where he acknowledged the difference between self-efficacy and PBC. He also suggested that the term ‘perceived behavioural control’ should be understood as perceived control over performance of behaviour.

Despite the overall success of the TPB, the model is not without criticism and limitations. One of the limitations of the TPB is related to the assumptions made by Ajzen regarding the similarities between self-efficacy and PBC constructs which was discussed in the previous sections. Another limitation is mentioned by Eagly and Chaiken (1993) who argue that there are other constructs such as habit, perceived moral obligation and self-identity that could predict individuals’ intentions and expected behaviour in the context of TRA model; however, the model did not explore these variables. They also note that the TPB’s attempt to address the limitations of TRA in the form of PBC suggests behaviour is deliberate and planned, yet the TPB does not show how people plan their behaviour and how the planning mechanism relates to TPB.

Taylor and Todd (1995) criticized both TRA and TPB on the ground that the models assume that an individual’s motivation is a prerequisite to perform a specific behavior; however, this assumption may be problematic when studying consumer adoption behaviour. As a result, Taylor and Todd (1995) proposed an extension to the TPB whereby they decomposed the constructs of the TPB into detailed components to form the Decomposed Theory of Planned Behaviour (DTPB).

2.2.3 Technology Acceptance Model (TAM)

The Technology Acceptance Model is one of the most prevalent models used to study users’ acceptance of technology in recent years. The Model attracted the attention of a considerable number of technology adoption researchers over the past few decades. The model was originally developed by Davis (1989) based on the TRA (described in

section 2.2.2). The following section describes the model's constructs and its key assumptions.

2.2.3.1 TAM Key Assumptions

The model was developed at the time when technologies such as personal computers and emails were diffused. TAM attempted to explain the factors that shape or affect a user's attitude and hence the user's behaviour towards using these technologies. TAM suggests that Perceived Usefulness (PU) and Perceived Ease of Use (PEU) are the key variables that affect system usage along with several other external variables (see Figure 2-6).

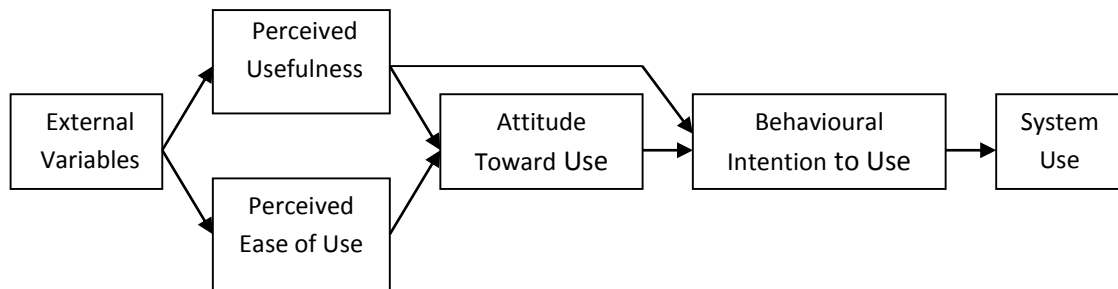


Figure 2-6: TAM (Davis et al., 1989)

Davis (1989) defines PU as “the degree to which a person believes that using a particular system would enhance his or her job performance”, while PEU is defined as “the degree to which a person believes that using a particular system would be free from effort”.

After the introduction of TAM, the model received noticeable attention from many researchers with mixed views. For example, Gentry and Calantone (2002) commented on the simplicity and versatility of TAM, focusing on the ability of the model to explain users' behavioural intentions in different contexts using two variables (PU and PEU). Despite the wide use of TAM in a number of technology acceptance studies in different contexts, a growing number of technology adoption researchers were concerned about its appropriateness and comprehensiveness. Those researchers

criticized TAM for postulating perceived ease of use and perceived usefulness as being always the key determinants of users' acceptance of technology systems (Park et al., 2007). This shortcoming has been acknowledged by Davis (1989) who stated that future research should explore more determinants that may also have an impact on perceived ease of use and perceived usefulness. Davis also acknowledges that the addition of such factors could improve the model's predictive power.

Further, a number of researchers argue that TAM predictive power is somewhat limited and hard to increase. They argued that the model needs to include additional constructs so that it can better explain the behavioural intention to use information systems (Legris et al., 2003; López-Nicolás et al., 2008). In addition, Venkatesh et al. (2003) stated that, unlike TRA, TAM eliminates the attitude factor in an attempt to describe intention succinctly. The fact that TAM continues to evolve where a number of extensions to the original model are being proposed as external determinants is yet more evidence of the limitation of the model.

A number of scholars have challenged TAM, arguing that the theory provides only limited guidance on ways to influence usage through design and implementation (Taylor and Todd, 1995; Venkatesh et al., 2003). Another limitation of TAM, which is a limitation attributed to many intention-based theoretical models, is the assumption that an individual's actual use of an information system is linked to the user's intentions. Bagozzi (2007) argued that in reality, an adopter may take into account a number of factors that in turn could influence the potential adopter's intention and/or decision regarding behaviour; however, TAM specifies only a limited factors shaping the user's intention. He argued that TAM did not take into consideration other aspects such as group collaboration, and cultural or social facets of technology acceptance. Bagozzi (2007) argues that:

“Much of human behaviour is not best characterized by an individual acting in isolation. To be sure, we sometimes act seemingly as individuals spontaneously, deliberately, or in response to social pressure. But perhaps more often than not we act interpersonally, or as agents of

organisations, or jointly with others, or in a holistic sense as members of collectives. Decisions with regard to technology acceptance and actual usage are often done collaboratively or with an aim to how they fit in with, or affect, other people or group requisites.” (p. 247)

2.2.3.2 Extension of the Technology Acceptance Model (TAM2)

In an attempt to address the shortcomings of TAM, in 2000, Venkatesh and Davis proposed an extension of TAM and developed a model known as TAM2. The proposed new model introduced two new processes focusing on social influence and cognitive instrumental processes. The social influence processes were introduced to capture concepts such as subjective norm, voluntariness, and image; while the cognitive processes were developed to capture job relevance, output quality, and result demonstrability as shown in Figure 2-7.

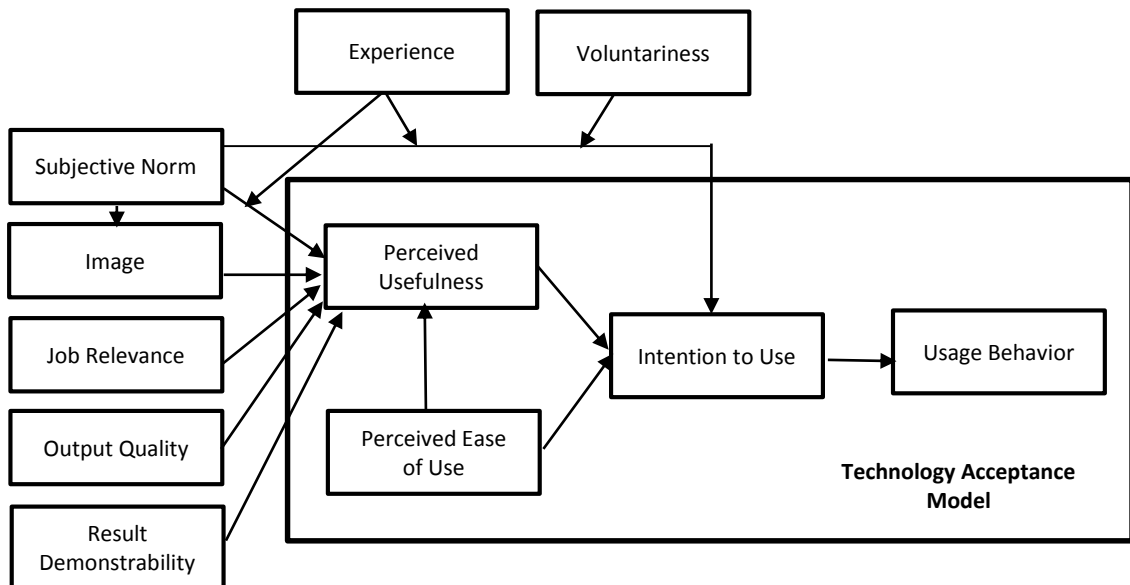


Figure 2-7: TAM2 (Venkatesh & Davis, 2000 p.188).

The constructs proposed by TAM2 have been tried in different contexts yielding mixed results. For example, Chismar and Wiley-Patton (2003) tested the applicability of TAM2 to the acceptance of Internet and Internet-based health applications within the health sector context. Results obtained partially confirmed the TAM2 model;

however, a core construct of the model, PEU, was not supported by the findings since PEOU was found to have an insignificant relationship with intention to use and as a result failed to predict intention to use, while PU was a strong determinant of intention to use. Another shortcoming attributed to TAM2 is its lack of comprehensiveness and its limited explanatory power. As one of the key reasons for developing TAM2 was to enhance the explanatory power of the original TAM, the Unified Theory of Acceptance and Use of Technology model (UTAUT) was developed to address the same limitation in TAM2 (Venkatesh, Morris, Davis, and Davis, 2003). The UTAUT model is described in Section 2.2.6 of this chapter.

2.2.4 The Social Cognitive Theory (SCT)

SCT is a learning-based theory proposed by Albert Bandura, a Canadian psychologist, in 1986. Bandura argues that individuals learn primarily by observing others around them. The SCT proposes five different constructs (Reciprocal Determinism, Behavioral Capability, Observational Learning, Reinforcements, and Expectations) which originated in the Social Learning Theory (SLT) developed by Bandura in 1960 in addition to the Self Efficacy which was added to the SLT constructs when the SCT was developed. The next section describes each of these constructs.

Reciprocal Determinism: this construct represents the fundamental idea of SCT. It refers to the dynamic and reciprocal interaction of an individual (a person with a set of learned experiences), environment (external social context represented by roles, models, situation ...etc), and behavior (represents duration, skills, complexity ... etc.). Bandura believes that human behavior is caused by continuous interaction between these three factors; i.e. he argues that learning takes place in a social context with a dynamic and reciprocal interaction of the three elements shown in Figure 2-8.

Bandura believes that the three elements of the triadic model have different weights in influencing an individual's behaviour since one of the elements might have a stronger influence than do the others. The interaction between the three main factors

would differ based on the individual, the behaviour being examined, and the explicit context where the behaviour takes place (Pajares, 2002).

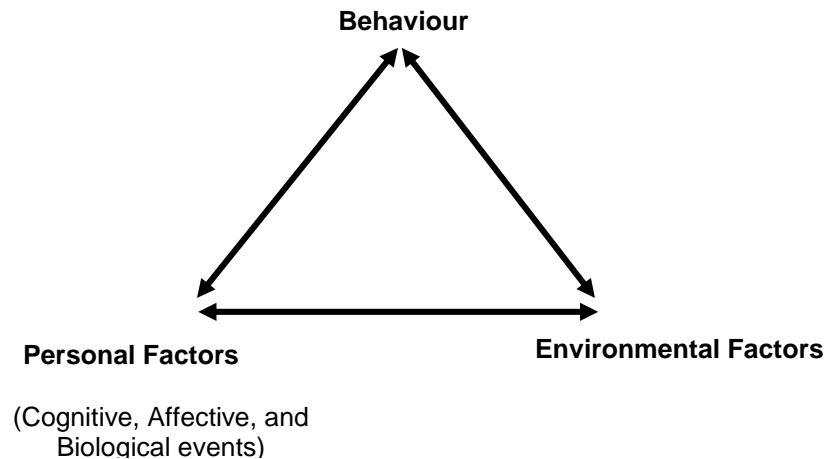


Figure 2-8: Bandura's SCT

Reinforcements: in this element of the theory, Bandura suggests that individuals' behaviour is affected by the intrinsic or extrinsic reinforcement they receive. Depending on whether the reinforcement is positive or negative, the individual will decide to continue or discontinue the behaviour. Bandura argues that reinforcements can be self-initiated or acquired from the environment through models who demonstrate the behaviour. Gibson (2004) states that reinforcement also provides a motive or inducement to convert learning into actual behaviour.

Expectations: this construct refers to the consequences of a person's behavior or the outcome expected by performing the behaviour. Bandura argues that individuals anticipate the consequences of their actions before engaging in the behavior. The anticipated outcome of performing the behaviour has an influence on their successful completion of the behavior. Expectations are derived largely from individuals' previous experience(s) and are subjective.

Self-efficacy: this construct refers to the belief that an individual possesses regarding his/her ability to perform a behaviour that will lead to a desired outcome. Bandura argues that self-efficacy refers to the level of a person's confidence in his or her own ability to successfully perform a behavior. This construct is unique to SCT although other theories have added this construct at later dates, such as the TPB (described in section 2.2.2.2). Bandura (2001) stated an individual's self-efficacy is key in performing a behaviour, and unless an individual believes that s/he can produce the desired results, there will be little incentive to act. Individuals with high self-efficacy tend to be willing to try new tasks, seek new challenges with a positive attitude, and persevere in a task even when things go wrong. On the other hand, individuals with low self-efficacy tend to avoid challenges, give up quickly when things go wrong (often dwelling on past failures), and become anxious when performing set tasks, perceiving the tasks as threats to be avoided rather than opportunities to be taken. Bandura suggests that self-efficacy can be improved using four approaches: mastery experiences (drawing on past successfully completed tasks similar to the one in hand), vicarious experience or social modeling (seeing someone else performing the behaviour), verbal persuasion (receiving encouragements from trusted individuals who know more about the person and the task to be performed), and a person's physiological state (stress level, moods and emotions).

Despite the enormous contribution made by SCT to the field of behavioural theory, the theory is not without limitations. Some of the limitations raised relate to the way the theory constructs have been organized and the dynamic interplay between these constructs. As a result, the organization of the constructs makes the extent to which each of these factors leads to actual behaviour unclear. In addition, because of the wide-reaching nature of the theory, it is rather difficult to operationalize it in its entirety (Social Cognitive Theory, 2016).

Also, the recent advances in communication and internet technology where digital materials are becoming readily available online have a significant impact on the way

knowledge is acquired. This has been noted by Bandura (2006) who suggested that the SCT be integrated with DOI.

One of the SCT constructs, self-efficacy, has attracted the attention of IS researchers many of whom have used the SCT construct to build new models to explain adoption behaviour within the IS context.

2.2.4.1 The Model of PC Utilization (MPCU)

The MPCU was developed by Thompson et al. (1991) and was largely derived from Tirandis' (1977) theory of interpersonal human behaviour. Thompson et al. developed this model to challenge the assumption postulated by TRA and TPB when predicting the factors that discouraged the use of Personal Computers (PCs). The authors of the MPCU focused on predicting actual usage rather than intention to use (the underpinning assumption of the TRA and TPB). The MPCU suggests a number of factors (shown in Figure 2-9) that predict the use of PC in organizational settings.

These factors are:

- (1) Social Factors influencing PC use related to “the individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others in specific social saturation” (p. 126);
- (2) Affect towards PC use which is based on Tirandis' belief that affects toward use are “feelings of job, elation, or pleasure, or depression, disgust, displeasure or hate” that a person links to a specific act (p. 127);
- (3) Complexity of PC use which is the degree to which “an innovation is perceived as relatively difficult to understand and use” (p.128);
- (4) Job-fit with PC use which is related to the extent to which an individual believes that using the technology will increase his or her job performance;
- (5) Long Term Consequences of PC use are the future expected outcomes of using the PC; and

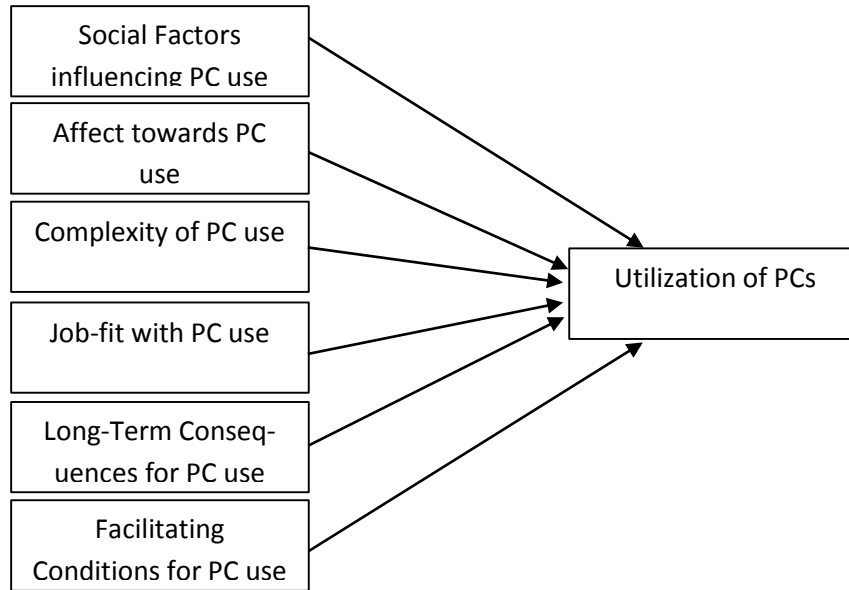


Figure 2-9: The Model of PC Utilization. Thompson et al. (1991)

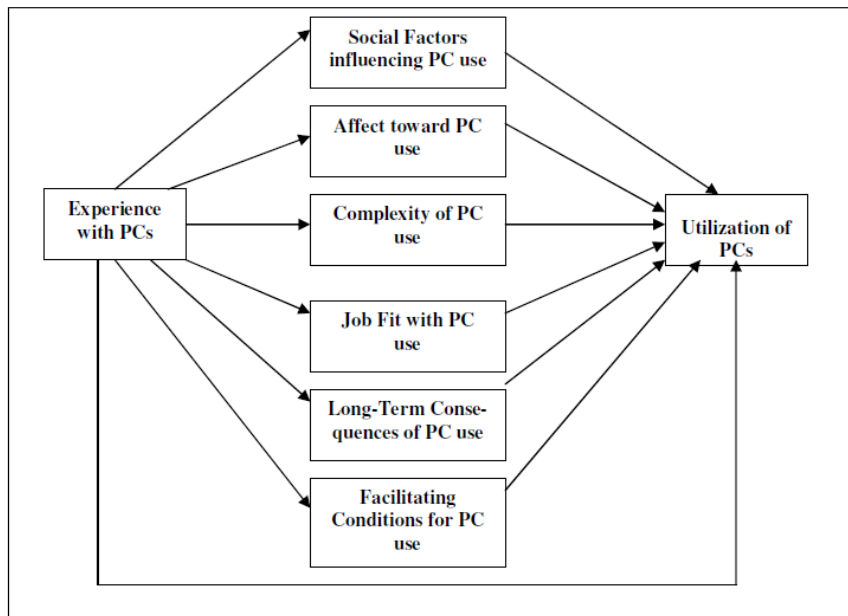


Figure 2-10: Extended Model of PC Utilization (MPCU). Thompson et al. (1994)

- (6) Facilitating conditions for PC use are all the types of support given to users that facilitate and enhance their PC utilization.

Empirical testing of the original MPCU resulted in an extension to the theory. In 1994, Thompson et al. extended their earlier work of 1991 by adding a new construct to the model: Experience with PCs. As shown in Figure 2-10, the new construct was postulated to have a direct as well as indirect (through all other construct) effect on PC utilization.

Compeau and Higgins (1995) conducted an empirical study using some of the SCT constructs to assess the impact of self-efficacy on the performance of various computer-related tasks. The authors proposed four constructs in their model: prior performance, outcome expectations, computer self-efficacy, and behaviour modelling. The results obtained indicated that there is a positive relationship between behaviour modelling and computer self-efficacy; this finding is consistent with Bandura's SCT. In addition, Venkatesh et al. (2003) incorporated some of the SCT constructs when developing UTAUT (see section 2.2.6).

2.2.5 The Motivational Model (MM)

There are a number of theories that relate to what motivates people to behave in a certain way. One of these theories is the Self-Determination Theory (SDT) of Deci and Ryan (1985). The SDT is comprised of a number of sub theories such as Cognitive Evaluation Theory (CET) and Organismic Integration Theory (OIT). On one hand, the CET postulates that humans have three instinctive needs; these needs revolve around our perception that we: are competent (we are good at something); have autonomy (we have choices and control over our actions); and have relatedness (we have a need to develop secure and satisfying connections with others around us).

Deci and Ryan (2000a) argue that in order for an individual to be motivated, all the three basic physiological needs are required and "one or two are not enough" (p.229). In addition, they argue that these needs are universal human qualities in the sense that "they are needed by people in all cultures" (p. 232) including people living in Abu Dhabi, the context of this study. Further, they make a distinction between two types

of motivations: intrinsic motivation (doing a task because the person is interested in performing the task or will enjoy doing it) and extrinsic motivation (doing something because of the subsequent rewards). Deci and Ryan further explain that meeting the autonomy and competence needs leads to developing interest (intrinsic motivation), and having a sense of competence alone does not enhance intrinsic motivation, rather it needs to be accompanied by a sense of autonomy and, possibly, relatedness.

On the other hand, the OIT makes further distinctions between various types of motivations: Deci and Ryan (1985) suggest that an individual's motivation can be explained in terms of a continuum ranging from Amotivation to Extrinsic motivation all the way to the desired intrinsic motivation depending on the amount of autonomy and the amount of internalization of the motivation a person has as shown in Figure 2-11. According to Deci and Ryan, Amotivation occurs when there is a perceived lack of contingency between the behaviour performed and its outcomes or when the person feels that he/she incompetent and lacks control.

Although the MM theory was primarily developed in the psychology domain, a number of IS researchers have adapted it in order to understand what motivates people to use computers (Davis et al, 1992; Venkatesh and Speier 1999; Venkatesh et al., 2003).

Vallerand (2000) expanded the SDT into the Hierarchical Model of Motivation. The newly-developed model was defined using a similar motivation continuum approach proposed by the SDT, but theorized that motivation operated at three different levels: the global (personal) level, the contextual (domain) level, and the situational (state) level. While acknowledging the similarities between the SDT and his own hierarchical model, Vallerand (2000) highlighted the difference between the two models by emphasizing: the significance of a hierarchical structure of motivation process; the role of psychological needs in the motivational sequence; the differences in individual needs; and the role played by relatedness.

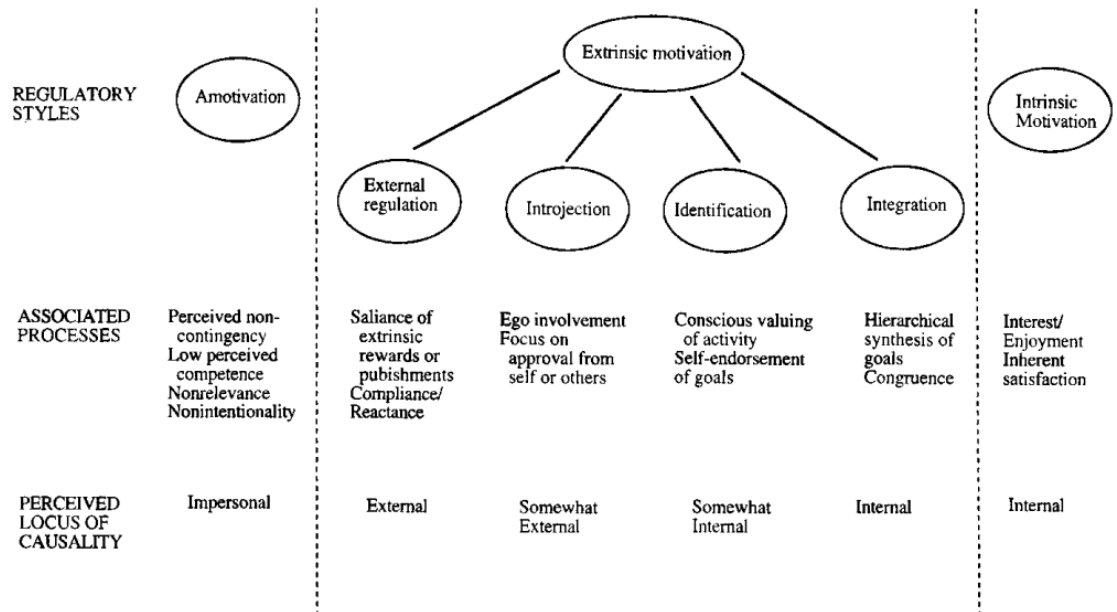


Figure 2-11: Types of Motivations. Deci and Ryan (2000b, p. 72)

The work conducted by Vallerand (1997) to enhance the STD has received favorable comments from Venkatesh (2003) who states that Vellerand presented an “excellent review of the fundamental tenets of this [MM] theoretical base” (p. 428).

The next section presents the theory that unifies all the various theories and models described above.

2.2.6 The Unified Theory of Acceptance and Use of Technology (UTAUT)

2.2.6.1 Theory Description

In 2003, Venkatesh, Davis and other researchers presented the UTAUT in an attempt to provide more explanation about user intentions to use an Information Systems and subsequent usage behavior. The UTAUT model is a combination of eight theoretical models: the Theory of Reasoned Action (TRA) (Davis et al. 1989), the TAM (Davis,

1989), the Motivational Model (MM) (Davis et al., 1992), the Theory of Planned Behavior (TBA) (Ajzen, 1991), the Combined TAM and TPB (C-TAM-TPB) (Taylor and Todd 1995), the model of PC utilization (Thompson et al., 1991), the Diffusion of Innovation Theory (DOI) (Rogers, 2003), and social cognitive theory (Compeau and Higgins, 1995).

The UTAUT model (shown in Figure 2-12) postulates four core direct determinants of usage intention: performance expectancy, effort expectancy, social influence, and facilitating conditions, along with another four moderators of key relationships: gender, age experience, and voluntariness.

The four constructs presented in the model were defined and related to similar variables in the eight models as follows:

Performance Expectancy (PE): Venkatesh et al., (2003) defined PE as *the degree to which an individual believes that using the system will help him or her to attain gains in job performance*. They further state that the five constructs in the other models that relate to performance expectancy are: perceived usefulness (TAM, and combined TAM-TPB), extrinsic motivation (MM), job-fit (MPCU), relative advantage (DOI), and outcome expectancy (SCT).

The authors noted that the performance expectancy construct within each individual model is the strongest predictor of intention to use a technology in both voluntary and mandatory settings. However, they argued that an individual's gender and age would influence the strength of the relationship between PE and behavioral intentions where this relationship is expected to be stronger for men, especially younger men. Therefore, they hypothesized that age and gender moderate this relationship.

The second construct in the model is **Effort Expectancy (EE)** which is defined as *the degree of ease associated with the use of the system*. This construct is consistent with three constructs from the existing models in capturing the concept of effort expectancy: perceived ease of use (TAM/TAM2), complexity (MPCU), and ease of use (IDT). The

authors stated that there is considerable resemblance among the construct definitions and measurement scales. These resemblances have been noted by a number of researchers (see Davis et al. 1989; Moore and Benbasat 1991; Plouffe et al. 2001; Thompson et al. 1991).

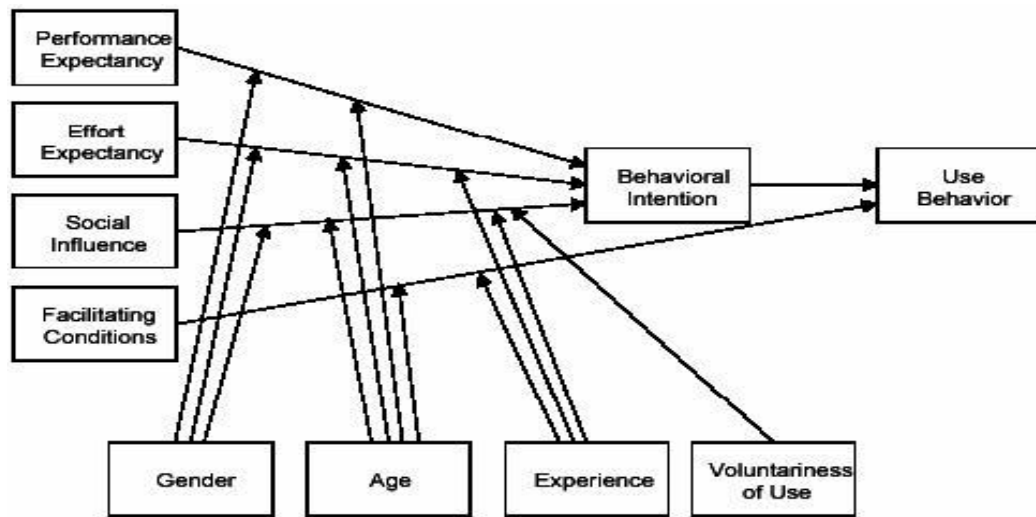


Figure 2-12: UTAUT model. Source: Venkatesh et al. (2003)

The authors argue that, based on the literature, the strength of the relationship between EE and behavioral intentions is influenced by age, gender and experience. As a result, they hypothesized that the relationship between EE and behavioral intentions would be stronger for women, particularly older women, who have less experience with the system.

Social influence (SI) is the third construct in the model. It is defined as *the degree to which an individual perceives that important others believe he or she should use the new system*. They argue that SI has been represented as a direct determinant of behavioral intention in various previous models as a subjective norm in (TRA, TAM2, TPB/DTPB and C-TAM-TPB), social factors in (MPCU), and image in (IDT). Further, they noted that Thompson et al. (1991) used the term ‘social norms’ when defining their construct, acknowledging its resemblance to the subjective norm within (TRA).

Despite the different names used to refer to this construct in the various aforementioned models, all models share a similar notion: that this construct relates to the way in which an individual's behavior is affected by others around him or her. Further, they suggested that the relationship between SI and behavioral intentions is influenced by the gender, age and experience of the adopter as well as the context in which the technology is introduced (i.e. voluntary or mandatory). Therefore, they argue that the influence of SI on behavioral intention will be moderated by gender, age, voluntariness, and experience, in such a way that the effect will be stronger for women, particularly older women, and specifically in mandatory settings in the early stages of experience.

The last construct presented by the UTAUT is **Facilitating Conditions (FC)** which are defined as "*the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system*". They stated that the definition of FC has been represented in previous models in the form of three different concepts: perceived behavioral control (TPBI DTPB, C-TAM-TPB), facilitating conditions (MPCU), and compatibility (IDT). It is noticeable that these constructs are designed to determine the possible technological or environmental barriers that might discourage the use of the technology. Based on the literature and the empirical results obtained by the authors, it appears that when both performance expectancy constructs and effort expectancy constructs are present, facilitating conditions become non-significant in predicting behavioral intentions; therefore, they propose that behavioral intentions will not be a significantly influenced FC.

In addition, the UTAUT excluded three of the constructs featured in previous technology adoption models: computer self-efficacy, computer anxiety and attitude towards technology. Venkatesh et al. argue that these three constructs will not have a significant influence on adopters' behavioral intentions.

Venkatesh et al. (2003) empirically compared the eight models mentioned earlier with the UTAUT model in four different organizational settings for a period of six months.

Their comparison showed that the eight models were able to explain between 17 percent and 53 percent of the variance in user intentions to use information technology. Next, they used the original data to empirically validate the UTAUT theoretical model; they found that the UTAUT model outperformed the eight individual models and explained 69 percent of variance.

2.2.6.2 Limitation of UTAUT

Li and Kishore (2006) were concerned about the robustness of UTAUT instruments. They carried out an invariance test on the measurement scale of the UTAUT to find out whether the main constructs in the UTAUT model were actually invariant across different users' subgroups. They carried out this test using a Web log system where they created different user subgroups based on the demographic characteristics of the users (gender, general computing knowledge, as well as users' specific Web logs categories such as frequency of use, experience with Web logs and Web log-related knowledge. The data analysis performed on the collected data (using the UTAUT measurement scale) revealed that the results showed significant difference in participants' interpretation of the measurement scale among the different subgroups in the Web logs context. As a result, Li and Kishore (2006) assert that researchers "need to apply caution when interpreting the results from the UTAUT instrument" (p. 183).

Other researchers suggested extending the UTAUT with the addition of new constructs to address some of the model's limitations. For example, Wang and Yang (2005) added the "big five factor" (or the Five Factors Model (FFM)) related to personality traits to the UTAUT as moderators. The added personality traits factors were categorized into: extraversion, conscientiousness, agreeableness, neuroticism, and openness. The results they obtained showed that the big five have a significant role to play in the model; hence, they recommended that future studies should reconsider the moderators in the original UTAUT and supplement it with the big five personality traits.

Carlsson et al. (2006) have reservations about the use of the UTAUT model to explain individuals' technology adoption decisions in non-organizational contexts. One such context will be the adoption of e-government services. Carlsson et al. used the UTAUT to examine the factors affecting the use of mobile devices/services in Finland. The findings of their study showed that not all UTAUT hypotheses were supported. As mentioned in section 2.2.6.1, the UTAUT proposes that attitude towards technology has no significant influence on behavioral intentions. However, Carlsson et al. found that attitudes towards using mobile devices or services have a significant effect on individuals' behavioral intentions to use the devices or services. In addition, they found that facilitating conditions did not have an influence on the use of mobile services. Carlsson et al. also stated that the UTAUT model was developed to describe and explain the adoption of information systems in organizational contexts. Therefore, they suggest that the model can be used "as a starting point" to understand adoption decisions of IT in non-organizational contexts.

To address some of the limitation of the UTAUT's applicability in a non-organizational context, Venkatesh et al. (2012) developed UTAUT2 (see Figure 2-13). The new model was developed in an attempt to extend the original model to suit the consumer technology context. UTAUT2 retained the four main constructs proposed by the UTAUT (performance expectancy, effort expectancy social influence, and facilitating conditions) and added three new constructs (hedonic motivation, price value and habit) while retaining age, gender and experience as moderators but omitting voluntariness from the new model. In addition, the relationships between the different constructs has been updated so that most of the relationship between the moderators and the constructs revolves around the new constructs rather than the original UTAUT constructs (with the exception of the facilitating condition construct which is moderated by gender, age and experience and has a direct and indirect effect on the dependent variables).

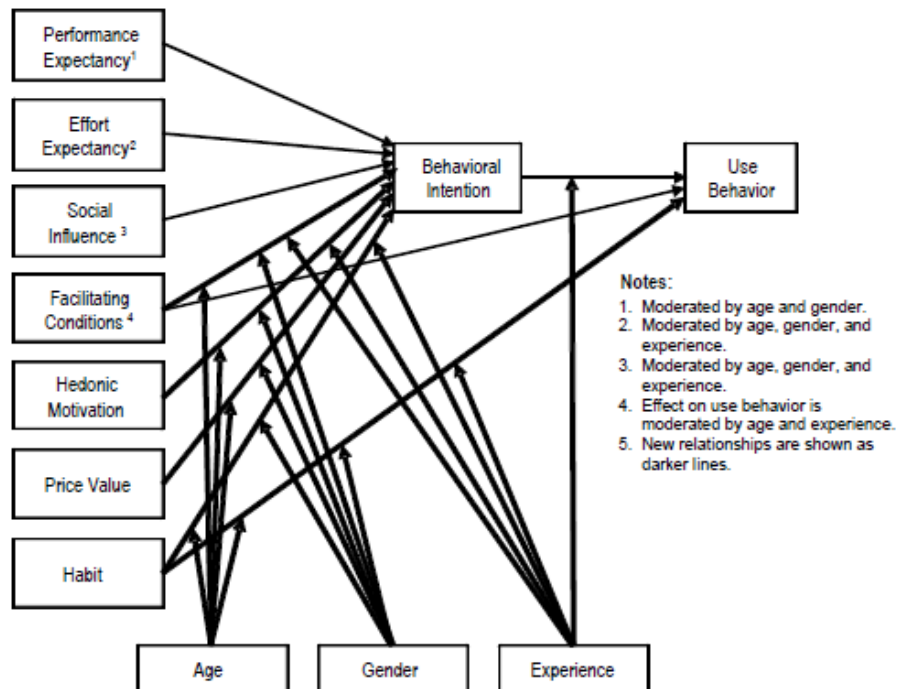


Figure 2-13 : UTAUT2 Venkatesh et al. (2012)

Venkatesh et al. (2012) defined the three newly added constructs as follows:

- *hedonic motivation*, is the fun or pleasure that a person gains from using a technology;
- The second construct, *price values*, is related to the monetary cost of using the technology. This construct highlights the main difference between the original UTAUT model and UTAUT2; because the UTAUT was developed for an organizational setting, there was no cost associated with the employees' use of technology, whereas because the UTAUT2 model was developed for the public consumer, a value in terms of price is involved.
- The third added construct, *habit*, is the extent to which a person tends to perform the behaviour automatically.

One major criticism of the UTAUT2 relates to its generalizability as the study was conducted in an area of technology that has a high penetration rate (mobile technology). The researcher evaluated the use of the UTAUT2 model as the main

framework in this study because it was developed to address individuals' acceptance of technology. While the original UTAUT construct could be relevant to e-government adoption (the context of this study), ironically the three newly added constructs that made the UTAUT2 suitable for understanding the factors influencing end-users' acceptance of technology would have little relevance in an e-government context: it is very unlikely that a person would be motivated to use online government services for pleasure or out of habit. While these are quite appropriate motivational factors in the context of mobile adoption, they are not applicable in the online government adoption context. Instead, the convenience of accessing online services 24/7 and the benefits gained by accessing government services online rather than face-to-face are likely to be relevant motivational factors in the context of e-government.

The next section reviews the studies that used the UTAUT in the e-government context.

2.3 E-government adoption literature review

2.3.1 Application of UTAUT in e-government context

As the UTAUT was originally developed in an organizational context and because Carter and Belanger (2004) argue that end-users' decision to adopt e-government services is more of an individual, personal decision, it has been important to test the applicability of the UTAUT to the acceptance of online government services by end-users.

One of the limited studies that scrutinized the validity of the UTAUT constructs in e-government contexts is that of Al-Shafi et al. (2009). Al-Shafi et al. conducted their study to explore the factors that influence citizens' adoption of e-government services in Qatar. The study surveyed 1179 citizens using UTAUT constructs. In contrast to the 70 percent found by Venkatesh et al. (2003), the study concluded that the UTAUT model explains only 14.3 percent of the variance in the dependent variables (i.e. of e-government use) and the other "unidentified" variance accounts for the remaining

85.7%. Possible reasons for this discrepancy could be attributed to the different cultural, government and economic contexts of both studies; however, the exact reasons are not clear.

In another study, AlAwadi and Morris (2008) surveyed 880 students using a modified version of the UTAUT to study the factors that determine potential users' adoption of e-government services in Kuwait, and concluded that future research should investigate other variables such as culture and trust in order to better understand the factors influencing users' adoption of e-government services in developing countries.

Al-Shafi et al.'s, and AlAwadi et al.'s studies are two of the limited studies that used the UTAUT in a non-western culture. Park et al. (2007) recommend further research into the UTAUT's applicability in non-western cultural contexts.

Al-Qeisi et al. (2015) conducted a recent study that investigated the applicability of the UTAUT in a non-western cultural context. After conducting a comprehensive review of the studies that utilized the UTAUT in the Middle East region, the authors located thirteen studies that utilized the UTAUT to investigate behavioural intentions and utilization of different online services in a variety of areas such as mobile technology, e-government, e-learning, and e-banking in the Middle East context. Details of these studies are presented in Table 2-1.

The results presented in Table 2-1 demonstrate that the UTAUT constructs were not accepted as universal predictors of users' intention by the different studies that applied the UTAUT in the Middle East context. This lack of consensus is recognized by Al-Qeissi et al. who stated that the "relations hypothesised between constructs in the original UTAUT model with respect to effort expectancy, social influences and facilitating conditions, are inconsistent" (p. 206). The only UTAUT construct that showed some consistency among the different studies conducted in the Middle East context is Performance Expectancy: all but one of the reviewed studies showed a significant relationship between performance expectancy and behavioural intention.

Table 2-1: Studies Applying UTAUT in the Middle East context

Author/year	Context	Model	Statistics	Sample	Location	Results
<i>Mobile Technology</i>						
Alkhunaizan, and Love (2012)	Mobile commerce	Revised: adding cost & trust as antecedents to intention and dropping experience & voluntariness Age & gender treated as variables	Factor Analysis & Regression Analysis	Smart phone Users	Saudi Arabia	PE significantly predicts usage intentions followed by cost and EE Usage BI predict actual usage FC shows no significant influence on actual usage. Gender has no significant difference on usage while age has.
AlOtaibi (2013)	Mobile Exchange	Modified: adding mobile exchange.	SEM	Mobile Traders	Saudi Arabia	PE, EE, and SI predict BI towards use of mobile exchange (trading stock market), and this is moderated by age, gender, and education.
Alwahaishi and Snášel (2013)	Mobile Internet	Modified: adding Perceived Value, Perceived Playfulness, and Attention Focus as antecedents to intention	CFA- SEM	Students	Saudi Arabia	PE, SI and FC significantly affect BI, which significantly impact ICT use.
<i>e-government</i>						
Al Imarah et al. (2013)	e-services	Original model	CFA-SEM	Academic Staff	Iraq	PE, EE, and FC contribute to the adoption of e-services and directly impact use behavior.
Al-Shafi and Weerakkody (2009)	e-services	Original model	Factor analysis & Logistic Regression	Citizens	Qatar	PE and SI good predictor of BI BI good predictor of e-government usage E-government users differ according to age, gender, and education.
Alshehri et al. (2013)	e-services	Amended model dropping use behavioral and voluntariness	CFA-SEM	Citizens	Saudi Arabia	PE, EE, and FC positively impact BI; however moderators (age and gender) have no impact. Internet experience moderates , EE-IB, SI-BI and FC-BI
<i>e-learning</i>						
Jaradat and Banikhaled, (2013)	University Website e-services	Modified by adding website quality construct as antecedent to intention	Warp PLS 3.0	Students	Jordan	PE and EE impact BI Experience impact WQ-IB and voluntariness impact SI-BI

Nassuora, (2012)	Mobile Learning	Modified by adding Attitude as antecedent to intention and dropping use behavior	EFA and Pearson Correlation	Students	Saudi Arabia	PE and EE impact BI directly SI and FC impact BI indirectly through Attitude.
<i>Social Media Acceptance</i>						
Salim, (2012)	Facebook	Modified by dropping use behavior	Pearson Correlation	Facebook users in Egypt	Egypt	EE and SI significantly impact BI FC has a significant impact on BI moderated by age and experience
<i>Information Technology (IT)</i>						
Al-Gahtani et al. (2007)	Desktop Computer	Modified: dropping voluntariness, substituting SI with SN	PLS –Graph	Knowledge workers in 4 organizations	Saudi Arabia	PE - BI and moderated by age only SN-BI and moderated by experience and age only.
<i>e-Banking</i>						
Abu Shanab and Pearson (2007)	Internet Banking	Modified by dropping facilitating conditions and use behavior from the model.	Factor analysis and Multiple Regression	Internet banking users	Jordan	PE-IB moderated by gender and age EE-BI moderated by sex and age SI-IB significant moderated by gender and experience EE-IB and FC-IB not significant
AlMashaqba and Nassar (2012)	Mobile Banking	Modified by adding security, design issues, reliability as antecedent to intention and education as moderator while dropping other moderators	Factor analysis and KMO	Bank clients	Jordan	PE, SI only impact BI PE-BI and FC-Use is moderated by experience and education
AlQeisi and Al-Abdellah (2013)	Internet Banking	Extended by replacing FC with web quality design and dropping BI.	FCA- SEM	Internet banking users	Jordan	PE-usage directly and EE-usage indirectly through PE Web quality–usage behavior impact is higher than PE-usage SN- usage is non-significant

Adapted from: Al-Qeisi et al. (2015)

Further, of the thirteen studies that applied the UTAUT in the Middle East context, only two were able to use the original UTAUT model constructs, and even these two did not agree on a set of constructs that predict BI. The study conducted by Al Imarah et al. (2013) found that PE, EE and FC predict BI; but Al-Shafi and et al.'s (2009) study concluded that PE and SI are the predictors of BI; hence, the only overlapping original UTAUT construct that showed positive results in both studies was PE. In addition, eleven of the thirteen studies had to modify the original UTAUT model (by dropping/adding some constructs). The inconsistent results and the need to amend the original UTAUT model in a number of studies conducted in the Middle East context raises further doubts about the applicability of the UTAUT in the Middle East context, particularly in the e-government context.

The next section examines non-UTAUT based models developed in an e-government context.

2.3.2 Other models of e-government adoption

Shareef et al. (2011) proposed a conceptual, non-UTAUT-based e-government adoption model consisting of a number of constructs drawn from existing e-government adoption literature (see Figure 2-14).

The Shareef et al. study took place in Canada, which is considered as one of the leading countries in providing mature online government services with citizens who are accustomed to using online services in other day-to-day activities. Shareef et al. assert that TAM, DOI, and TPB theories cannot capture and specify the complete “essence” of citizens’ behaviour regarding the adoption of e-government. They also assert that e-government adoption behavior differs based on the maturity level of any given online government service, which implies that the factors influencing online services are contextual depending on the organizational, technological, economic, and social perspectives of the services. This finding indicates that a theoretical e-government

adoption model developed in a certain context might not necessarily work in a different context.

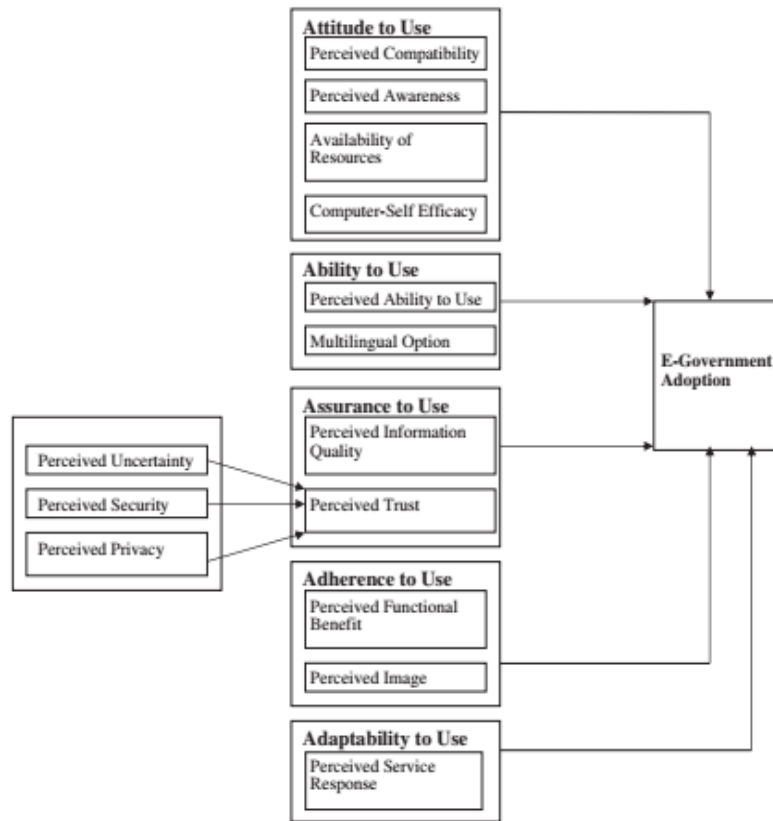


Figure 2-14: eGAM Model by Shareef et al. (2011).

Further, Gilbert, Balestrini and Littleboy (2004) investigated the barriers to and benefits of e-government services adoption. The study examined the reasons for individuals choosing to access government services via electronic self-service methods in preference to more traditional service delivery methods. In order to answer the research questions, the approach taken involved an investigation of the factors that individuals consider important when evaluating whether or not to use the service. This was achieved by examining the benefit-barrier factors relating to potential willingness to use the services rather than asking individuals about their perceptions they developed from actual system usage and relating this to whether they actually intend to use it further.

Gilbert et al. concluded that potential usage (i.e. the willingness of an individual to use the online service delivery option) can be predicted by the following factors: trust, financial security, information quality (all adoption barriers), time and money (both adoption benefits). Gilbert et al. argue that both the barriers to adoption and the benefits of adoption need to be considered by government officials when developing plans to increase the take-up of their electronic services.

Further, they stated that willingness to use online services will increase if government organizations can grow trust relationships with individuals by assuring them that their sensitive financial details are secure, provide relevant, accurate current information, and save individuals time and money.

One of the few studies that proposed a new conceptual model for e-government adoption in a non-western context is that conducted by Wallang, Henman, and Gillingham (2016), who undertook a scoping qualitative study to identify the key determinants that influence an individual's pattern of usage of different e-government services within the Malaysian context. The results of their study revealed that Relative Advantage, Effort Expectancy, Social Influence, Trust in e-government and Quality of Website are key determinates of e-government use.

In addition, Rehman et al. (2012) proposed another conceptual model to explain the factors that influence e-government adoption in Pakistan. Their conceptual model was developed using literature related to e-government adoption in addition to expert reviews involving government officials, academic researchers and software engineers in Pakistan. The model proposed six factors (level of e-government, website design, e-readiness, security, trust and quality of service) as the determining factors of citizens' intention to adopt e-government services in Pakistan (see Figure 2-15).

To validate the proposed model, Rehman et al. (2012) surveyed 138 Pakistani citizens. The study sample was dominated by relatively well-educated, younger participants with just over 85 percent of the participants holding a university degree or higher (half

of them held a post-graduate degree), and 77.5 percent falling within the 20 to 40 age group. The authors used stepwise regression analysis to predict the participants' intention to use e-government services for two purposes: to obtain information and to conduct business transactions. The results obtained revealed that the proposed model explained 21.8 percent of the variance in users' intention to adopt e-government to obtain information, and 41.9 percent of the variance in users' intention to adopt e-government for transaction purposes. The results revealed that of the 13 constructs proposed in the model, 5 were supported (awareness, perceived ease of use, service quality, information quality and transaction security); the remaining constructs were not supported.

However, another study conducted by Ahmad, Markkula and Ovio (2012) in Pakistan also proposed a set of factors different from those proposed by Rehman et al. (2012). Ahmad et al. developed an amended UTAUT model to investigate the factors influencing the uptake of e-government services in Pakistan, and concluded that ease of use, usefulness, social influence, technological issues, lack of awareness, data privacy, and trust were the main factors influencing e-government adoption in Pakistan. The findings of these two studies reflect the current state of research into factors influencing the adoption of e-government: despite the similar context and time frame in which the two studies were conducted, the results obtained were not consistent.

A number of other studies have investigated various aspects of e-government such as online services provided, supply-side factors, and critical success factors, or have proposed theoretical models that have not been empirically validated (see Kaohsiung Fu et al. (2006), Fahad Al Harby, et al. (2012), Alhujran et al., (2008)). However, none of these studies provided a complete, purpose-built demand-side model that possesses reasonable predictive power of the factors influencing e-government adoption in the Middle East context, creating a research gap that this study seeks to address.

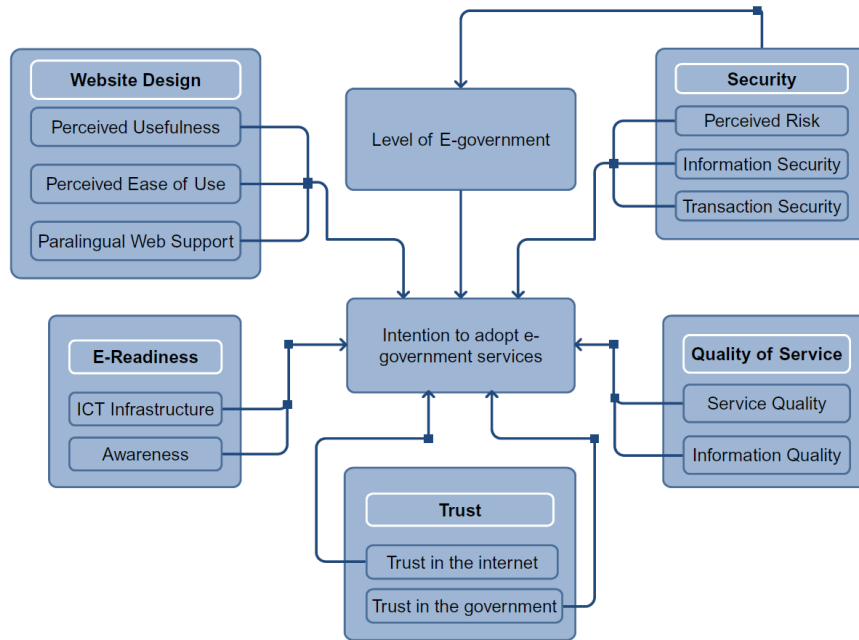


Figure 2-15: E-government adoption model in Pakistan (Rehman et al. 2012)

2.4 Conclusion

This chapter provided a review of the major theoretical frameworks (DOI, TRA, TBP, TAM, SCT, MM, MPCU and UTAUT) that seek to explain the adoption of new innovations. The reviewed models provide a foundation for understanding the factors that influence technology acceptance in general. However, the theoretical frameworks reviewed in section 2.2 are not specific to the domain of e-government acceptance. Further, as mentioned in Section 2.2.6, although the UTAUT model was more comprehensive and outperformed all the models that preceded it, mixed results have been obtained when applying the UTAUT in the e-government context.

Given that the UTAUT does not seem to perform particularly well in describing e-government adoption, this chapter also reviewed the limited number of models that have been proposed by e-government adoption researchers to better explain the factors that influence end-users' adoption of e-government specifically (Al-adawi et al., 2005; Kumar et al., 2007). These models theorized a number of constructs

influencing citizens' adoption of e-government such as perceived security, perceived privacy, and trust in the medium (Al-adawi et al., 2005); user attributes which consist of (perceived risks, perceived control and Internet experience); and website design and service quality (Kumar et al., 2007). However, none of the models reviewed has been empirically validated or tested.

Furthermore, the different theoretical frameworks reviewed in this chapter do not provide a clear consensus on the factors that influence the usage of e-government by potential adopters. From an empirical viewpoint, the limited e-government adoption literature available also does not provide broad agreement on these factors. Although some factors that may affect e-government adoption are addressed by the UTAUT there are other factors that the UTAUT does not address, such as website quality, trust in the e-government, advertising and the provider's role (Wallang, Henman, and Gillingham, 2016), and added value, which is similar to DOI's relative advantage (Kunstelj et al., 2007). In addition, there is some evidence that public awareness of e-services and trust are the key pivotal factors influencing e-services acceptance and use (Kunstelj et al. 2007; Lassnig and Markus, 2003). Kunstelj et al. also identified security and privacy concerns (which relate to trust, but are not the same thing) as additional important barriers to e-services use. In addition, Kunstelj et al. recognized that all the factors that influence e-government satisfaction and adoption are not fully understood and called for more research to fill this gap by determining all the important factors that influence e-government adoption by end-users.

The current research aims to address this gap by developing and testing an e-government adoption model to explain end-users' adoption of e-government in the context of developing countries. A number of scholars have questioned the applicability of western-developed technology acceptance models in a non-western context (for example see Loch et al., 2003; Mao and Palvia, 2006; Wetzels and Schepers, 2007; McCoy et al., 2007). Therefore, there is a need for further research in this area.

The output of this study will address this gap by developing and validating a theoretical “grassroots” e-government adoption model to ensure that any factors not previously identified in other studies are not omitted. This will be done using a mixed methods approach to collect qualitative and quantitative data.

The reasons for adopting this approach will be discussed in detail in the next chapter.

3. CHAPTER THREE: RESEARCH METHODS

3.1 Introduction

This chapter starts by stating the research aim and objectives, followed by a section that explains the significance of this study. Then, the chapter presents a discussion on the mixed-methods research approach used for this study, i.e. the qualitative and quantitative methods. The chapter also presents a detailed description of the various attributes of the qualitative methodological approach adopted during the qualitative phase. It includes a discussion of the qualitative sample used, data collection protocol adopted, and the analysis techniques applied during this phase. The qualitative phase discussion is followed by a detailed description of the quantitative approach adopted for this study. It includes the survey design, the survey instrument validation process followed, the sampling technique used, the data collection approach, and the data analysis procedures that this research followed. Finally, the chapter concludes with a discussion of the ethical considerations observed during the course of this study.

3.2 Research Aim and Objectives

As mentioned in Chapter One of this study, the aim of this research is to enhance knowledge in the area of e-government adoption and to propose a theoretical model that further explains the factors that influence end-users' acceptance of e-government. Specifically, this study investigates the use of e-government services by end-users in Abu Dhabi. In particular, the study objectives are to:

1. understand end-users' perceptions of electronic interaction with government agencies in Abu Dhabi;
2. examine the factors that influence end-users' use (or lack of use) of e-government services in Abu Dhabi;
3. develop an e-government adoption model; and
4. empirically test and validate the e-government adoption model developed in this study.

3.3 Research Significance

Large amounts of public money are spent on the provision of e-government services, yet little is known about what drives people to accept such services. Heeks (2003) studied the success and failure rates of e-government projects in a number of developing or non-western countries and he suggested that more than one-third of e-government projects are total failures; a further half are partial failures; and only about one-seventh are successes.

This research is significant because the findings of this study will contribute to the currently scant e-government adoption literature available by providing insights regarding the end-users' perceptions of e-services. Also, the study is significant because it will contribute to the limited e-government literature from the demand-side. A better understanding of end-users' demand for e-services will lead to higher adoption rates of these services. This project will address a gap in e-government adoption literature by providing a tested and validated theoretical model in order to study the factors that influence end-users' uptake of online government services. The resultant model will enable e-government practitioners to better plan, design, develop, deploy and manage e-services initiatives that best meet the needs of users.

Although a number of studies looked at the factors that influence users' uptake of technology in general, there have not been many empirical studies of the factors that influence end-users' uptake of e-services, particularly in Abu Dhabi. This study will address this shortcoming and provide new insights into the factors that influence the uptake of e-government services by end-users. The study also contributes to theory by building and validating an e-government adoption framework to add to the scant literature of e-government adoption by end-users.

3.4 Research Questions

This project is intended to answer the following primary research question: "What factors affect the uptake of e-government services by end-users in Abu Dhabi?". The

primary research question has been further divided into a number of secondary questions as follows:

- RQ1 - What are end-users' perceptions of electronic interaction with government agencies?
- RQ2 - What makes end-users decide whether or not to use e-government services?
- RQ3 - What are the relationships between the factors affecting e-government adoption?
- RQ4 - What are the similarities and/or differences between the factors influencing UAE nationals' and expats' adoption of e-government services?

3.5 Research Approach

3.5.1 Mixed Methods Research

Information systems researchers have identified a number of factors that should be considered when selecting a research approach. It has been reported that the nature of the study's topic, the research objectives and the study's context are among the factors that researchers need to consider when selecting an approach (Benbasat, Goldstein, & Mead, 1987; Galliers, 1992; Jenkins, 1985). After evaluating the different research approaches available, the researcher decided to use a two-phase, sequential mixed-methods research approach for this study.

A number of researchers point out that mixed-methods research is becoming increasingly recognized as a major research approach or research paradigm along with qualitative and quantitative approaches (Creswell, 2012; Denzin, 2010; Tashakkori & Teddlie, 2009; Polit & Beck, 2008; Johnson, Onwuegbuzie & Turner, 2007).

Johnson et al. (2007) collected and analyzed nineteen general definitions of mixed-methods research offered by leaders in this field to articulate a more comprehensive definition or summary of what is called 'mixed methods'. They suggest the following definition:

“Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g. use of qualitative and quantitative viewpoints, data collection, analysis, interference techniques) for the broad purposes of the breadth and depth of understanding and corroboration.” (p. 123)

Further, Johnson et al. (2007) state that the mixed-methods research approach not only recognizes the importance of the traditional research methods (quantitative and qualitative methods) but also offers a powerful third research method option that provides “the most informative, complete, balanced, and useful research results” (p. 129). This viewpoint supports Ghauri and Grønhaug’s (2005) argument that having both qualitative and quantitative data in a study would yield results that are more robust. Furthermore, Tashakkori and Teddlie (2010) point out that using different research methods enables the researcher to address different aims in the research project as well as triangulating data sources (using more than one data source method in a research project) which validates the results obtained.

Johnson et al. (2007) categorized the mixed-methods research approach into three broad types: qualitative, mixed method and quantitative. The “Pure” mixed approach is located between two extremes, Pure Qualitative and Pure Quantitative, with a number of different combination of the two extremes (Qualitative Mixed and Quantitative Mixed) depending on where they fall within the spectrum as shown in Figure 3-1.

The first type is called *Equal Status* which falls in the centre of the spectrum. This type suits “pure” mixed methods researchers who believe that qualitative and quantitative data and approaches add insights to most, if not all, their research questions.

The second type, *Qualitative Dominant*, suits mixed method researchers and qualitative researchers who adopt the constructivist-poststructuralist-critical views of the research process but at the same time they recognize the importance of incorporating quantitative data and approaches into their otherwise qualitative research project.

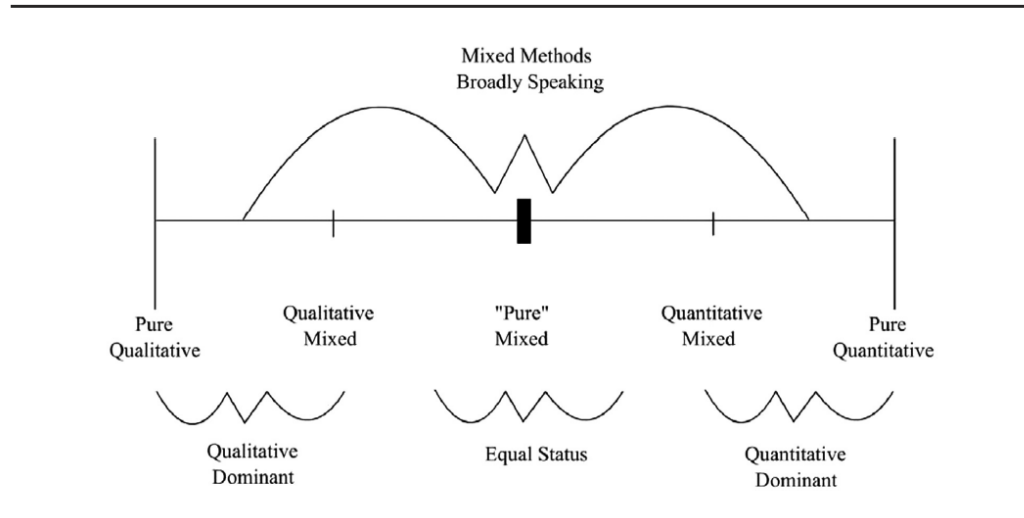


Figure 3-1: Mixed Methods. Johnson et al. (2007, p. 124)

On the other hand, the third type, *Quantitative Dominant*, suits mixed-methods researchers and quantitative researchers who adopt the post-positivist view of the research process. They concurrently recognize that the inclusion of qualitative data and approaches are advantageous for their researcher.

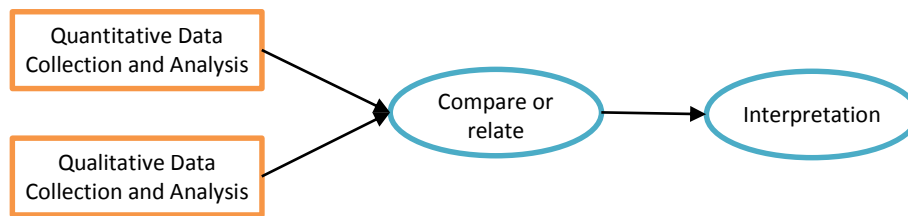
Creswell (2012) provides a more detailed classification of the various types of mixed-methods research designs. As shown in Figure 3-2, Creswell identified the following six major designs:

- a) Convergent mixed-methods design: comprises of simultaneously gathering both quantitative and qualitative data, merging the data, and using the results to best understand a research problem.
- b) *Explanatory sequential mixed methods design*: comprises of first gathering quantitative data, followed by the collection of qualitative data to help explain or elaborate on the quantitative findings.
- c) *Exploratory sequential mixed methods design*: consists of first, collecting qualitative data to investigate a problem and then gathering quantitative data to test relationships found in the qualitative data.
- d) *Embedded mixed design*: in this design researchers formulate a study made of two phases: phase one uses a primary data source of quantitative or

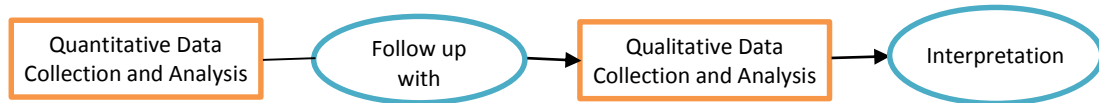
qualitative data, and phase two uses a secondary data source of qualitative or quantitative data that plays a supportive role in the study.

- e) *Transformative mixed methods design*: employs one of the above four designs (convergence, explanatory, exploratory, or embedded), but encloses the design within a transformative framework or lens.
- f) *Multi mixed methods designs*: occur when researchers conduct a research (either a single multiphase study or a series of separate studies) to investigate a phenomenon.

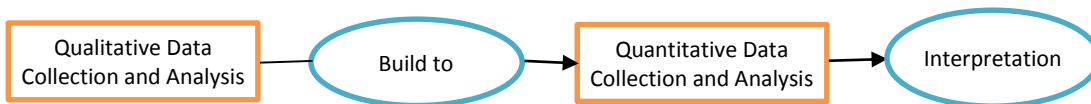
(a) The convergent parallel design



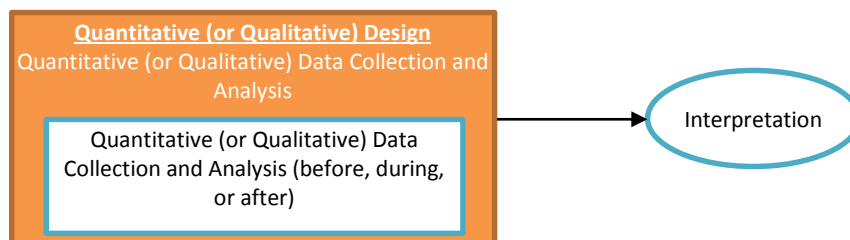
(b) The explanatory sequential design



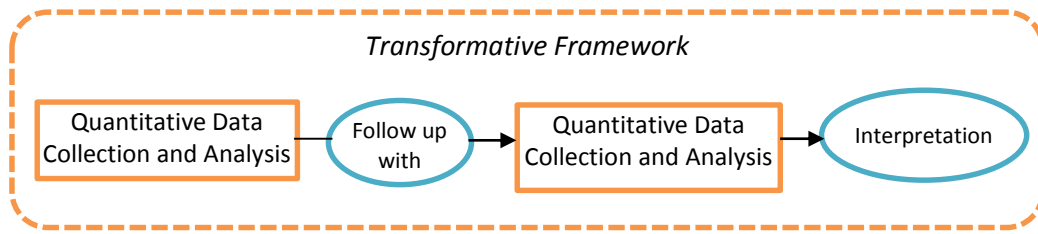
(c) The exploratory sequential design



(d) The embedded design



(e) The transformative design



(f) The multiphase design

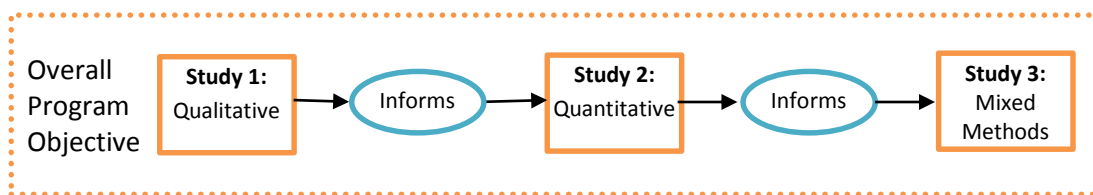


Figure 3-2: Classification of the different types of mixed-methods research designs.

Source: Creswell (2012, p 541)

After evaluating the six major mixed-methods research designs, the exploratory sequential mixed-method design was selected as the most suitable framework for this study for the following reasons: 1) the inherited traits of the sequential mixed-methods design (first collecting qualitative data to explore a phenomenon, and then gathering quantitative data to explain relationships found in the qualitative data) is consistent with the nature of the study and the research objectives discussed earlier in this chapter) such a design allows the researcher to identify measures actually grounded in the data obtained from participants of the study by listening to the participants' views rather than approaching the topic with a predetermined set of values.

Creswell (2012) states that the four major steps of the exploratory design start with the collection and analysis of qualitative data to understand a given phenomenon. This is followed by the second step in the process where researchers develop an instrument, state a hypothesis or identify variables based on the qualitative data obtained in the first step preparatory to testing in the next phase. The second step in the process

connects the initial qualitative phase to the subsequent quantitative part of the investigation.

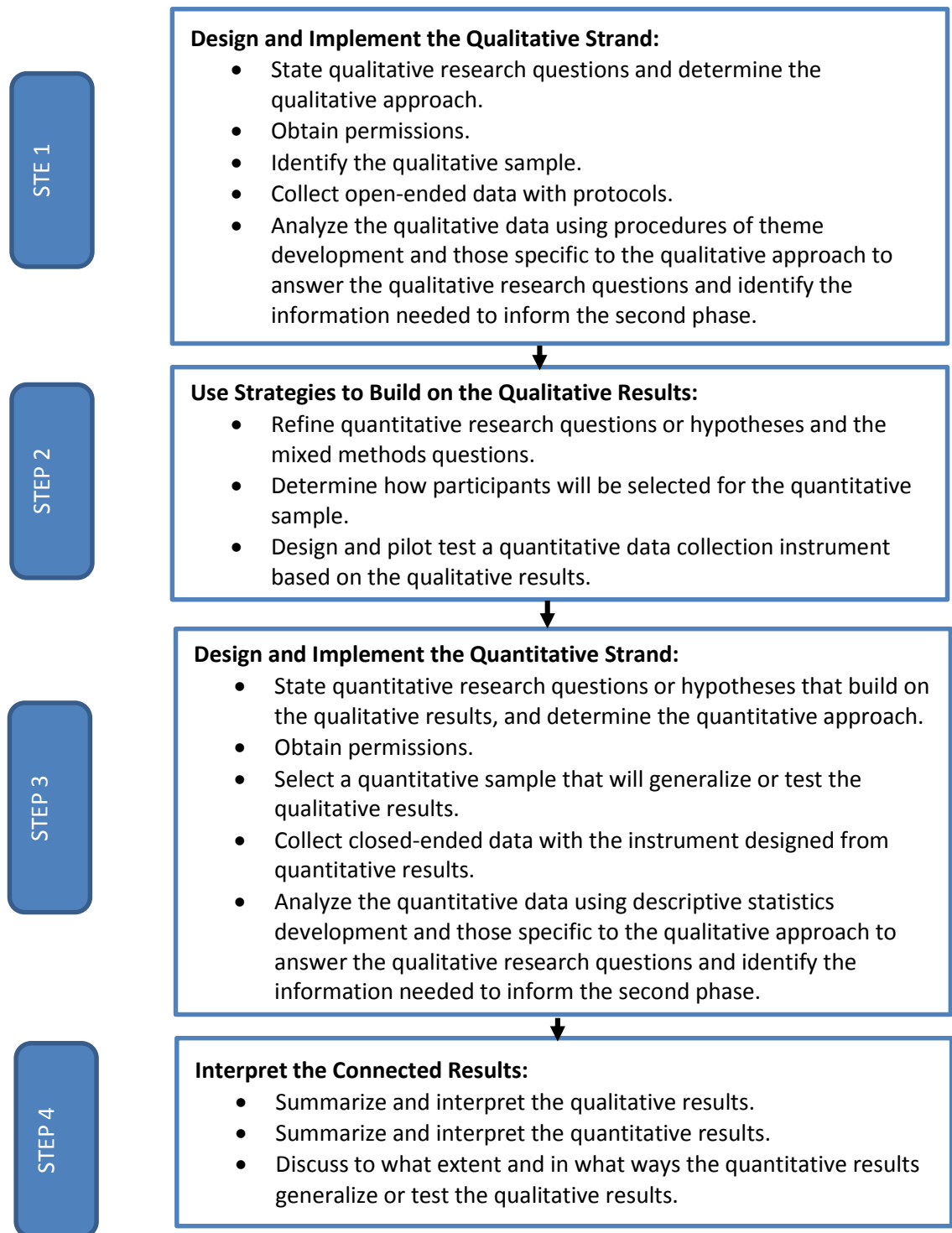


Figure 3-3: Flowchart of the basic Procedures in implementing an exploratory design. Creswell and Plano (2011, p. 88)

In the third step of the process, the researcher carries out the quantitative phase of the study in order to examine the identified constructs using the instrument built for this phase with a new sample of participants. In the last phase of the process, the researcher determines to what extent and in what ways the quantitative results generalize or test the qualitative results. Figure 3-3 summarises this process.

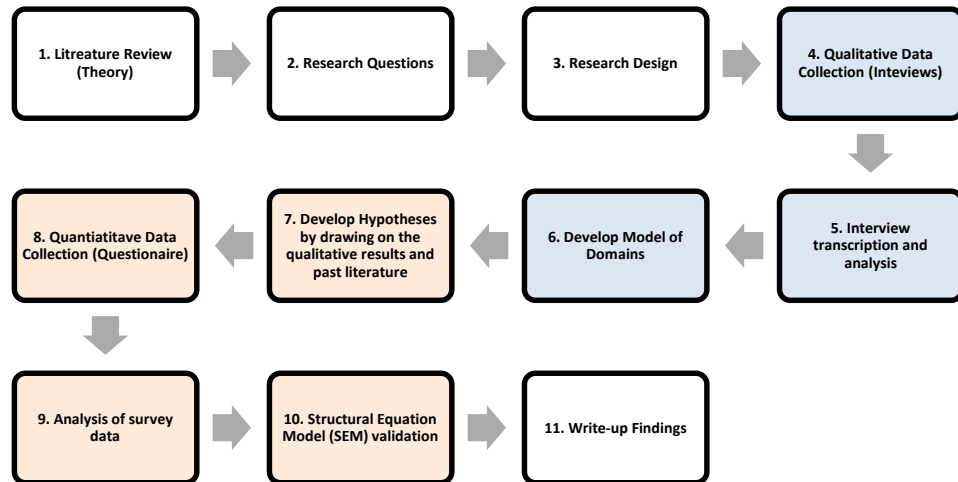


Figure 3-4: Summary of the Research Approach Adopted

Todd (2010) argues that one of the six recommended purposes of conducting qualitative interviews is to generate a hypothesis or theory to explain social processes and relationships that can be tested using quantitative research methods. Also, Cresswell (2012) states that researchers can use past studies in the literature to formulate hypotheses for their studies. In this study, the researcher combined both of these approaches and thus developed hypotheses for the quantitative stage based on both the findings from the qualitative phase and also on past literature. This is illustrated in step 7 in Figure 3-4, and the hypotheses are described in Section 5.3.2. Adopting this approach was consistent with the advice of Sekaran (2003) and ensured that the hypotheses were informed by the new ideas generated in the qualitative stage, and also by existing theoretical concepts from e-government adoption literature known to be valid in other cultural contexts. Thus, the hypotheses used in the

quantitative stage allowed the research to fill both of the research gaps identified in Chapter Two, Section 2.5.

A summary of the relationship between the research objectives, research questions and data collection methods used in each phase of the project is provided in Table 3-1.

The following section provides a detailed description of the research approach followed during the two phases starting with the qualitative phase.

3.5.2 Qualitative Phase

In this phase, a qualitative approach used to collect data from study participants to enable the research to develop a more in-depth understanding of the factors that influence end-users' use (or lack of use) of e-government services in Abu Dhabi. The data collected during this phase enabled the researcher to answer the secondary research questions 1, 2, 3 and 4 stated in section 3.4.

The qualitative data collected during this phase, along with the technology acceptance theories reviewed in the previous chapter, particularly the UTAUT, enabled the researcher to build an e-government adoption model. Shah and Corley (2006) argue that qualitative methods of data collection are powerful, particularly when used to "build new or refine existing theories" (p. 1821). The model developed during this phase has been used to formulate hypotheses that are tested during the quantitative phase of this project, which is described in section 3.5.3.

The decision to use the qualitative approach in this phase was informed by Creswell's (2009) evaluation of the assumptions inherent in the qualitative research approach. First, he states that the qualitative approach assumes that research is conducted in an informal, relaxed environment; in the present study, the cultural context and the topic being investigated are such that it is unlikely that participants will "open up" in a strict, formal environment. Second, the qualitative approach allows the participants to be heard; in the present study, a large part of which involves users' perceptions, this is

essential. Third, using this approach allows the researcher to interact with the research participants; again, a close interaction between researcher and participant will elicit participants' perceptions that are fundamental to the research.

Table 3-1: Research Objectives, Research Questions and Data Sources.

Objectives	RQ#	Research Questions in Each Phase	Data Source
Phase I			
To understand end-users' perceptions of electronic interaction with government agencies	RQ# 1	What are end-users' perceptions of electronic interaction with government agencies?	Interviews
To examine the factors that influence end-users' use (or lack of use) of e-government services	RQ# 2	What makes end-users' decide to use or not to use e-government services?	Interviews and technology adoption literature
To develop an e-government adoption model	RQ# 2	What make end-users' decide to use or not to use e-government services?	Interviews and technology adoption literature
	RQ# 3	What are the relationships between the factors affecting e-government adoption? (based on hypothesis)	
	RQ# 4	What are the similarities and/or differences between the factors influencing UAE nationals' and expats' adoption of e-government services?	
Phase II			
To empirically test and validate the e-government adoption model.	RQ# 1	What are end-users' perceptions of electronic interaction with government agencies?	Survey
	RQ# 2	What are the factors that affect e-government adoption in Abu Dhabi?	
	RQ# 3	What are the relationships between the factors affecting e-government adoption? (testing the hypothesis)	
	RQ# 4	What are the similarities and/or differences between the factors influencing UAE nationals' and expats' adoption of e-government services?	

The semi-structured interview questions were informed by the UTAUT model, technology adoption and e-government literature such as that mentioned in the theoretical review section above.

3.5.2.1 Trustworthiness of Qualitative Research

Lincoln and Guba (1985) suggest that the worth of a qualitative study is established by its trustworthiness. They devised four constructs suited to the naturalistic paradigm namely: *Credibility* (refers to confidence in the 'truth' of the study results), *Transferability* (refers to showing that the results can be applied in other contexts), *Dependability* (the results are consistent and could be repeated), and *Confirmability* (refers to the degree of neutrality or the extent to which the study results are formed by the study participants and not researcher own bias).

Among many other qualitative researchers, Shenton (2004) acknowledged Lincoln and Guba's trustworthiness constructs and states that these constructs have won considerable favour in ensuring the rigor of qualitative studies. Shenton suggested a number of useful strategies that researchers can follow to meet Lincoln and Guba's constructs. A summary of these strategies is shown in Table 3-2.

Table 3-2: Strategies for Qualitative Research Rigor

Quality Criterion	Possible provision made by researcher
Credibility	<ul style="list-style-type: none"> Adoption of appropriate, well recognised research methods Development of early familiarity with culture of participating organisations Random sampling of individuals serving as informants Triangulation via use of different methods, different types of informants and different sites Tactics to help ensure honesty in informants Iterative questioning in data collection dialogues Negative case analysis Debriefing sessions between researcher and superiors Peer scrutiny of project Use of "reflective commentary" Description of background, qualifications and experience of the researcher Member checks of data collected and interpretations/theories formed Thick description of phenomenon under scrutiny Examination of previous research to frame findings

Transferability	Provision of background data to establish context of study and detailed description of phenomenon in question to allow comparisons to be made
Dependability	Employment of “overlapping methods” In-depth methodological description to allow study to be repeated
Confirmability	Triangulation to reduce effect of investigator bias Admission of researcher’s beliefs and assumptions Recognition of shortcomings in study’s methods and their potential effects In-depth methodological description to allow integrity of research results to be scrutinised Use of diagrams to demonstrate “audit trail”

Source: Shenton (2004, p. 73)

3.5.2.2 Semi-structured Interviews

Kahan and Cannel (1957) describe interviews as “a conversation with a purpose” (p, 43) used in "attempts to understand the world from the subjects' point of view" (Kvale, 1996).

Similarly, Patton (1980) describes the purpose of qualitative research interviewing as the act of finding out what is on the interviewee’s mind, allowing the researcher to seek new insights and to examine a phenomenon in a particular context (Robson, 2002). In addition, DiCicco-Bloom and Crabtree (2006) noted that qualitative interviewing has become one of the most commonly used data collection methods in qualitative studies.

Patton categorizes qualitative research interviewing into four main types: informal conversational interviews, general guided interview (semi-structured), standardized open-ended interviews and closed, fixed response interviews.

Semi-structured, in-depth interviews were used to collect qualitative data for this study because, firstly, they allow the researcher to systematically collect a large amount of data from the interviewee while maintaining some sense of informality and keeping the interviews conversational. Second, the use of semi-structured interviews allowed the topics and issues to be specified in advance, in outline format, thus freeing the researcher to decide the sequence and wording of the questions in the course of the interview (Patton, 1980).

These semi-structured interview characteristics are important for this research because many of the participants come from different backgrounds. The researcher could follow the outlined questions and yet be responsive to the interviewees and change the sequence and wording of questions when necessary. The informal conversational nature of the interviews gave the interviewees a chance to freely share their computing experience without being constrained and limited to answering questions with standardized wording. However, the format still permitted the researcher to collect systematic and comprehensive data from all interviews. Finally, this approach allows the researcher to probe and guide interviewees, when needed, to make sure that all topics on the outline are covered without compromising the “friendly conversation” nature of the interview (Spradley, 1979) as well as eliciting information that is complete (Gordon 1975, Austin 1981, Bailey 1987).

Walsham (2006) argues that in a qualitative inquiry, researchers can use a theoretical framework at the initial stages of the inquiry to guide the study design and data collection; thus, the development of the interview questions for this study was guided by the literature related to technology adoption. This approach was followed to give structure to the interviews and to guide, rather than to influence the conversation with preconceived ideas. Indeed, the interviewees were allowed and encouraged to contribute their own topics during the interviews. Nevertheless, a general understanding of the technology adoption literature was essential to enable the researcher to approach the interviews with an “open mind” and “not an empty head” (Dey, 1993).

Two rounds of semi-structured interviews were used for this study for two reasons: first, two rounds enable the researcher to establish a relationship with the participants thereby allowing any feelings of unease and anxiety about the interview process (which would have been a foreign experience to many of the participants especially from Asia, the Middle East and Africa) to be mitigated. It also provided the opportunity for the

researcher to explain the purpose of the study to the participants and answer any questions they may have.

Similarly, Smith and Osborn (2008) argue that the use of semi-structured interviews in qualitative studies has many merits including rapport building, allowing for greater flexibility of coverage, and allowing the interview to go into novel areas; moreover, it tends to produce rich data. In addition, semi-structured interviews add the following values to the study: first, it has the potential to overcome the poor response rates found in quantitative surveys (Austin 1981) during the first phase of the project; second, it is well suited to studies that intend to explore the attitudes, values, beliefs and motives of individuals (Richardson et al. 1965, Smith 1975); third, it provides the opportunity to assess the validity of each respondent's answers by spotting non-verbal cues, which is particularly useful when discussing sensitive issues (Gordon 1975); fourth, it can enable comparability by ensuring that participants answers all questions asked (Bailey 1987); fifth, it ensures that the answers provided by the participants reflects their own ideas and that they did not receive help from others (Bailey 1987) which can affect the validity of the results obtained.

Before the start of the data collection, the interview questions were revised a number of times in order to maximize their clarity and to minimize potential interviewer bias as much as possible. A pilot interview was carried out with one of the potential participants to test the interview questions, interview protocols, and digital recording equipment. This led to minor changes in the wording of several interview questions and a few amendments to the protocol, particularly concerning the set-up of the digital recording tools. However, because the pilot interview was very successful in collecting rich data, this data was included in the research.

3.5.2.3 The Sample

Todd and Benbasat (1987) state that due to the large volume and high intensity of data generated using “verbal protocols”, which include semi-structured interviews, sample

sizes are commonly small (between 2 and 20) and appropriate for qualitative research studies. In addition, Marshall (1996) argues that samples for qualitative studies tend to be small in size. Further, he states that the number of required interviews usually becomes obvious as the study progress; however, data collection needs to continue until new categories, themes or explanations stop emerging from the data. To ensure that “enough” data has been collected to adequately answers the research questions, the interview process continued until the researcher was convinced that data saturation (Glaser and Strauss, 1967) or informational redundancy (Lincoln and Guba, 1985) had been achieved because no new themes were emerging from the interviews. A total of sixteen participants were interviewed.

Fade (2003) summarized the different sampling techniques used in qualitative studies (see Table 3-3). This summary provided a useful guide for selecting the sampling technique appropriate for this study. A mixed sampling strategy (Purposive Sample and Snowball Sample) was used to collect the required data to answer the research questions relevant to the qualitative phase (RQ1 to RQ4). The Purposive Sample was carefully selected to represent the different end-user’s group in the Abu Dhabi. Participants were identified and selected according to their age, gender, computer literacy, qualifications and nationality. The sample included participants who are adopters as well as those who are non-adopters of e-government services. In addition, adopters who used e-government services for personal and business purposes were interviewed (more details about the interviewing process and the interviewees are provided in the next chapter).

Table 3-3: Sampling techniques commonly used in qualitative research.

Sampling technique	Basic features
Purposive/systematic, nonprobabilistic (Bowling, 1997a; Mays & Pope, 2000)	Selects subjects with a particular characteristic

Sampling technique	Basic features
Theoretical (Glaser & Strauss, 1967)	Data from an initial purposive sample is analysed. Further participants are then selected to locate specific data that might help develop or challenge emerging ideas
Snowball (Bowling, 1997a)	An initial group of respondents are asked to recruit others who they know have the characteristics that are of interest to the researchers. If even more participants are still required, the second group are asked to do the same thing
Convenience (Bowling, 1997a)	Sample selected based on convenience, i.e. location, willingness to take part
Quota (Bowling, 1997a)	Known parameters of a population and their distribution are used to purposively select a sample that is representative of the population
Deviant case (Neuman, 1999)	A special type of purposive sampling. Selects cases that differ substantially from the dominant pattern.

Source: Fade (2003)

The details related to the practicalities of qualitative sample including participants' list (using pseudonyms), gender, educational background and the participants general computing background is presented in chapter Four (Section 4.2).

3.5.2.4 Data Analysis

The qualitative data was analyzed using the domain analysis method suggested by Atkinson and Abu El Haj (1996). Prior to commencing the data analysis, the researcher went through the interview transcripts several times to familiarize himself with the data. The domain analysis technique enabled the researcher to identify the main issues or 'domains' raised by interviewees, followed by constructing a taxonomy of sub-categories found in the data, followed by identifying the components within each sub-category, and finally the inter-relationships between the various domains was identified. A full description of the domain analysis method used in the qualitative phase of this study is provided in Chapter Four, Sections 4.3.

3.5.2.5 Summary of the Qualitative phase

This section described the research approach followed during the qualitative phase. In this phase, a number of semi-structured interviews were conducted with a selected group of Abu Dhabi residents in order to better understand their perceptions of e-government services. The section also described the sampling technique used to recruit the study participants as well as the data analysis techniques adopted.

The rigour of this stage has been ensured by: following Lincoln and Guba's (1985) advice in establishing the trustworthiness of qualitative studies described in section 3.5.2.1; developing and conducting the semi-structured interviews in a way that enabled the research to collect accurate data while reducing interviewer bias as described in section 3.5.2.2; ensuring that the sample selected represented the different end-user groups in Abu Dhabi as described in section 3.5.2.3; and following the domain analysis systematic methods to analyse the qualitative data as described in section 3.5.2.4.

The next section describes the methods used during the second phase of the study where the quantitative approach was taken.

3.5.3 Quantitative Phase

In this phase of the study, the researcher collected and analyzed data from a sample of Abu Dhabi residents using quantitative data collection and data analysis techniques to test the hypothesis developed during the qualitative phase of the study. In this section, the rationale for using the quantitative approach is given in addition to describing: the survey design; the instrument validation process; the procedure followed when translating the instrument into the Arabic language; and the sampling technique used. It also describes the data collection and data analysis procedures used during the quantitative phase.

3.5.3.1 Rationale for Using Quantitative Approach

The decision to adopt a quantitative approach for this phase was informed by the inherent characteristics of the quantitative research approach described by Creswell, 2012 (for the list of these characteristics see Appendix A - 8). Creswell defines the quantitative research approach as:

“an inquiry into a social or human problem, based on testing a theory composed of variables, measured with numbers, and analyzed with statistical procedures, in order to determine whether the predictive generalizations of the theory hold true” (p. 1)

The researcher decided to use this approach for a number of reasons. First, the quantitative approach enables the researcher to explain and empirically test the relationship between the factors identified in phase one of the study. Second, this approach enables the researcher to collect numeric data from a large number of people using an instrument with pre-set questions and responses. Third, the quantitative approach enables the researcher to perform statistical analysis on the data collected during the qualitative phase of the study. The data collected and the subsequent analysis enabled the researcher to answer the secondary research questions RQ 1, 2, 3, and 4.

3.5.3.2 Instrument Design

According to Evans (2005), online surveys have significant advantages over other data collection methods. Therefore, the researcher decided to conduct a self-administering, closed-ended online survey using Qualtrics software, version 2013, as the primary data collection tool for this phase of the study. Dillman, (2007) and Rasinski, (2005), among others, believe that surveys are one of the most powerful tools for collecting quantitative data. Hence, the survey approach was deemed the most appropriate for the purposes of this study.

As stated previously, this study used a mixed-methods approach. The development of the survey instrument items was largely informed by the taxonomic analysis of the primary domains that emerged from the qualitative phase of the study (see section 4.4.2.2 and 4.4.2.3) and was guided by the wider technology adoption literature reviewed in Chapter Two.

The researcher decided to use a self-administering, online survey as the primary data collection and management tool for this project. The online survey was chosen in preference to other formats for the following reasons: first, the use of online survey software enabled the researcher to create a well-designed online survey that has an appealing interface; there is a logical flow of questions; the questions in each screen are presented in manageable chunks, and visual clues (such as a progress bar) can show the completion rate of the survey. Dillman et al. (2008) argue that well-designed surveys encourage volunteers to participate and to complete a survey. Second, the use of an online survey made the distribution and administration of the survey relatively simple because a large number of participants can be reached easily. Third, the online survey enabled the study participants to undertake the survey in either Arabic, English, or to switch between the two languages in real time as they were doing the survey. Providing such an option for bilingual volunteers was useful because they had the opportunity to refer to any question in either language if they needed any clarification, which arguably improved the quality of data collected and the survey completion rate. Fourth, the use of Qualtrics enabled the researcher to screen the data easily and export it to SPSS version 22 for further analysis.

To ensure that the sample covered various groups of Abu Dhabi residents, a copy of the online survey was printed and distributed to participants who have limited computing background or those who would find it difficult to access the Internet (mainly participants from a lower socio-economic group).

The researcher decided to use an 11-point Likert scale because this would: minimize categorization effects, improve data analysis, and reduce measurement errors

(Scherpenzeel, 1999). In addition, the researcher believed that it would be easy for the participants to “mark” each item out of ten points, which would enhance the overall usability of the survey. The volunteers who piloted the survey confirmed that giving a rating out of ten to each statement saved them time and made the survey easy to complete.

A more challenging decision that the researcher needed to make concerned the items (questions) to include (ask) in the survey given the lack of a universally agreed upon, fully tested and approved scale that measures the factors affecting end-users’ acceptance of e-government services in Abu Dhabi.

Tharenou et al. (2007) states that in the event that there are no validated established or readily available instrument that measures the constructs, the researcher may need to develop a new scale. A list of the study constructs along with a definition of each of these construct as well as an explanation of the meanings associated with responses to each survey item using 11-point Likert scale is summarized in section (5.4).

Piloting the survey before sending it out was the important final step in the survey design process. The pilot survey was conducted to address the two main methodological considerations: validity and reliability when using a qualitative survey instrument (Everitt, 1996, Oppenheim, 1992, Parahoo, 2006, Polit & Beck, 2008). The validity and reliability of the survey instrument is discussed in the next section of this chapter (Section 3.5.3.3).

A third reason for conducting the pilot survey was for testing purposes. The researcher carefully selected fifteen pilot participants to represent those who are likely to take the actual survey. Participants were selected based on their age group, education level, and gender, current occupation and residence status (UAE national or Expat). Before they took the survey, the researcher asked each participant to note her/his comments while completing the online survey. Participants were asked to comment on the amount of time they took to answer the survey questions, the clarity and sequence of the

questions, the user interface, and any technical issues that emerged while using the online survey tool.

Conducting the pilot survey and the feedback collected from the participants, in addition to the discussion that followed with the research supervisors, led to minor adjustments to the instrument, thus adding to the instrument's content validation process. The next section describes the instrument validation process followed in order to minimize any possible "instrumentation" issues.

3.5.3.3 Validity of the Survey Instrument

The lack of a universally agreed upon instrument that measures users' intention to use online government services in Abu Dhabi made it necessary to design a new measurement instrument, as described in section 3.5.3.2, rather than using a previously established instrument. Having said that, the researcher strongly believed that paying attention to the possible instrumentation issues identified by Straub's (1989) seminal work on validating survey instruments in MIS research helps to substantiate the findings of a study.

During the construction of the survey items, the researcher was conscious that any of the survey items used needed to accurately measure the concepts that emerged from taxonomic analysis (the study constructs) and at the same time the items had to be valid, (i.e. the instrument items should be asking the right questions to measure accurately the constructs under investigation). For this reason, it was important to ensure that any instrument developed to measure the study construct was guided by the technology adoption literature so that previously validated items were used wherever possible. In other words, to minimize any possible instrument validity issues, the researcher always preferred to use previously tested and validated survey items that were deemed suitable for measuring the construct under investigation in this study.

Straub (1989) argues that a quantitative study is considered valid when it uses a validated measurement tool that addresses three validity concerns: *Instrument Validity*,

Internal Validity and *Statistical Conclusion Validity*. Straub states that a validated tool should measure what it is supposed to measure (Instrument Validity); it should examine all possible variance and alternative hypotheses (Internal Validity); and the study findings should be derived using correct statistical techniques and procedures (Statistical Conclusion Validity).

Straub asserts that for Information Systems (IS) researchers to be able to strengthen their confirmatory empirical findings, they first need to validate their research instrument. Further, he mentioned that the order of establishing the different validities is critical to the overall validity of the study i.e. Instrument Validity should be established first, followed by Internal Validity and finally establishing Statistical Conclusion Validity.

Straub listed various issues that can occur as a result of violating the order of precedence of these validities by listing the outcomes that occur when a study focuses on establishing Statistically Validity only, or establishing Internal Validity and Statistically Validity while omitting Instrument Validity. Figure 3-5 below lists the different outcomes that can be reached in a given study depending on which validity has been established.

The instrument validation in this study was informed by Straub (1989), who recommends that researchers follow a five-step instrument validation process (shown in Figure 3-6) to ensure that the research instrument measures what the researcher intended it to measure (Bryman and Hardy, 2004; Straub, 1989; Bryman, 2004). Further, he states that the instrument validation process serves as a “reality check” for the researcher because s/he is engaged in a constant comparison of theory and practice, which ultimately results in more “theoretically meaningful” constructs and constructs relationships (Bagozzi, 1980).

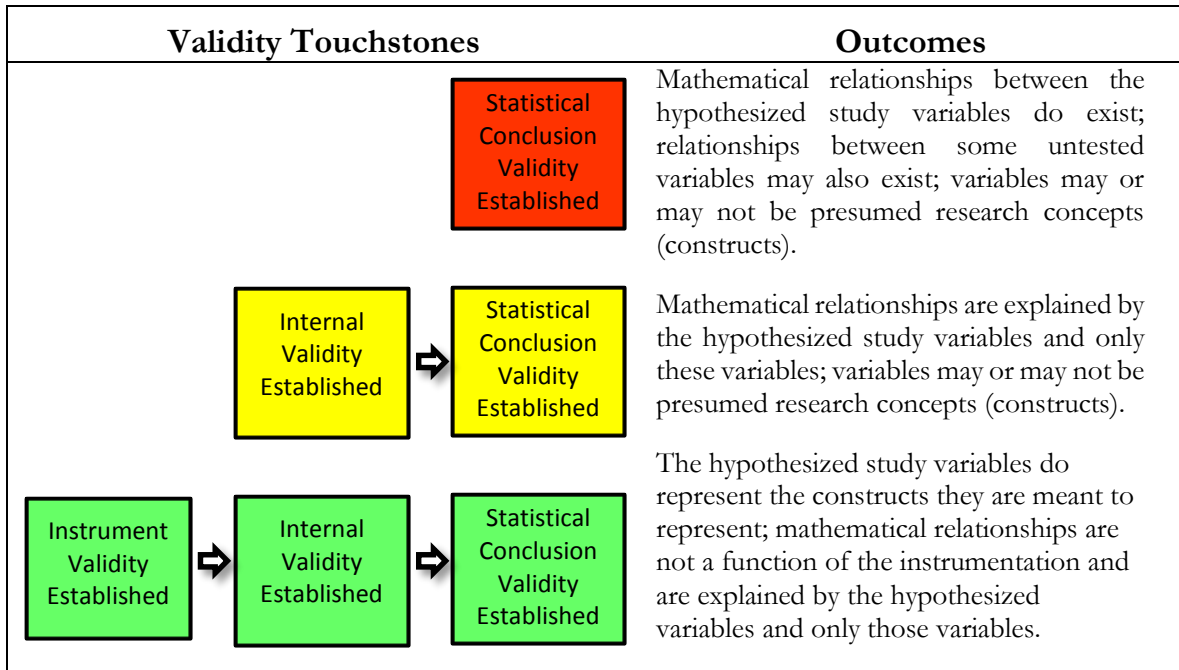


Figure 3-5: Outcomes from Omitted Validities (from Straub, 1989 p. 152).

The next section of this chapter describes the steps taken to establish the various instrument validation components listed in Figure 3-6.

Content Validity: Cronbach (1971) and Kerlinger (1964) indicate that an instrument is considered valid when it draws representative questions from a large pool. Because there is no single agreed upon measurement scale that measures users' intention to use e-government services the researcher examined a number of measurement items used in studies that examined constructs similar to the ones identified in the taxonomy. To ensure that the instrument items used in this study measured the constructs that they were intended to measure, a number of previously validated survey items used in the wider technology adoption studies measuring similar domains to the ones identified as a result of the qualitative phase of this study has been reviewed. A list of these items was compiled into a bank of potentially useful items. The total number of potentially relevant and previously validated items added to the bank of questions for further evaluation is 96 items. A list of the survey instrument items selected to measure the

study constructs, as well as the literature source that informed and helped in formulating the survey questions, is provided in Table 5-2 in section 5.4.

Hair et al. (2010) state that soliciting the judgment of individuals with expertise in the subject under investigation regarding the suitability of an instrument items is an appropriate means of establishing content validity. Guided by his supervisor, who is an expert in this area, the researcher selected 45 items from the bank to be included in the survey instrument. The selection of the final instrument items was informed by the domains identified during the qualitative phase of this study where the bank items that “capture the essence of the construct” (Straub et. al., 2004, p.10) were selected.

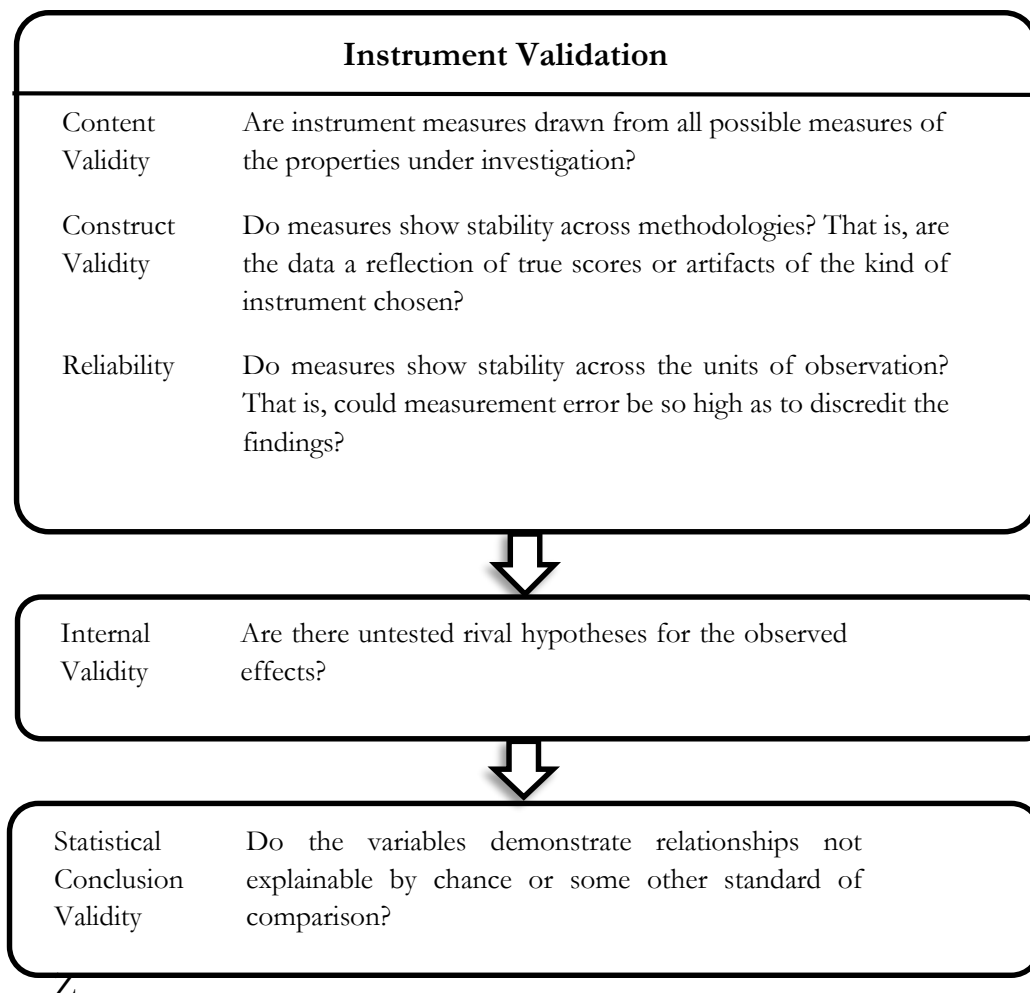


Figure 3-6: Questions Answered by the Validities (Straub 1989, p.150).

In addition, the selection of items was also informed by: the clarity of the question wording and the suitability of the question to the study context. In some cases, minor changes were made to the wording of the questions to suit the context of this study. The final instrument was submitted to the Ethics Committee at Curtin University for approval; the committee consists of a panel of experienced academics who examined the survey instrument for both content and potential risk to human participants. The survey instrument was approved and given approval number IS_14_06 (see Appendix A - 2).

Construct Validity: according to Straub (1989), construct validity is in primarily an operational issue. The concern raised by this validity component is whether the chosen measures are true descriptions of the constructs or just artefacts of the methodology itself (Campbell and Fiske, 1959; Cronbach, 1971).

According to Bagozzi (1980), there are two types of construct validity: convergent and discriminant. It is expected that an instrument that passes the construct validity test will have a high correlation between the items that measure the same construct (in other words, the items measuring the same construct are clustered together); in this case, the instrument is considered to achieve convergent validity. At the same time, the study constructs are expected to vary from one another (Bagozzi et al., 1991); in other words, the constructs (and the items comprising them) are expected to be distinct and uncorrelated, thereby establishing the discriminant validity of the instrument.

One of the reasons for conducting the pilot survey described in the previous section was to identify and address any construct validity issues before distributing the final survey. The preliminary analysis of the pilot data showed that the participants' responses were clustered together to form the expected constructs and at the same time the constructs were distinctly different from each other.

The subsequent analysis of the quantitative data using Structured Equation Modeling (SEM) techniques confirmed the construct validity of the instrument used in this research project. SEM is a multivariate technique that researchers can use to examine the correlations among a number of variables in order to estimate a series of interrelated dependence relationships between these variables simultaneously. According to Leedy and Ormrod (2013), SEM is typically used to test a previously hypothesized model using path analysis and confirmatory analysis techniques.

The instrument used in this study passed both convergent and discriminant validity tests; thereby confirming construct validity. Chapter Five of this study describes in detail the SEM procedures followed in establishing these validities.

Reliability: According to Gill and Johnson (2002), the reliability of questionnaires are related to the consistency of responses to the questions presented in a survey measurement tool and hence is an evaluation of the measurement accuracy (Straub, 1989). High Cronbach coefficient Alphas are usually considered as sign for reliable measures. The reliability of the measurement scales is established by measuring the Cronbach alphas for the various constructs under investigation. Again, Chapter Five presents a detailed discussion and the results that show how the instrument reliability has been established.

After establishing the instrument validity, it was important to consider the other two validity touchstones described by Straub (1989), the *internal validity* and the *statistical conclusion validity*, contributing to the overall validity of the research.

Threats to the internal validity of a study can be mitigated by ensuring that all alternative explanations of the strength of links between constructs have been evaluated, i.e. that there are no untested rival hypotheses for the observed effects (Straub, 1989). This concern is addressed by testing different competing SEM models using the five independent variables identifying all possible relationships between the

study's constructs that theoretically make sense rather than testing only the hypothesized model. The results obtained are presented in Chapter Five, Section 5.7.

On the other hand, threats to the *Statistical Conclusion Validity* depend on whether appropriate statistical techniques and statistical tools are employed in a study. This study addressed this concern by using the covariance-based SEM techniques, and SPSS version 22 and AMOS statistical tools to analyse the gathered data. According to Gefen et al. (2000), SEM techniques are widely accepted by top IS journals as a means of establishing the statistical conclusion validity of a study. The application of SEM techniques in this study as well as the results obtained from subsequent statistical analysis performed including Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) and path models is described in Chapter Five, Sections 5.7 and 5.8.

3.5.3.4 Instrument Translation into Arabic Language

Because a number of Abu Dhabi residents understand only the Arabic language or have limited English language abilities (mainly UAE nationals and some residents from other Arab countries) it was necessary to translate the survey instrument into Arabic using back translation, a procedure commonly used to test the accuracy of translation in cross-cultural surveys (Brislin 1970 and 1980). According to Harkness (2003), the term 'back translation' means the *translation of a translation* back into the source language.

To eliminate any possible translation issues and to ensure that both the Arabic and English versions of the instrument asked "the same questions" the back translation procedure was followed. First, two different authorized Arabic translators independently translated the items from English to Arabic. Then, the two Arabic versions of the survey were checked by a group of bilingual Arabic Language teachers working for the Abu Dhabi Women's College. The two versions were combined to produce the "best" translated document. The document was then back-translated into

English. The final translated copy was then compared with the original English instrument to check its validity. Minor variations were detected but these did not change the meanings of the questions. To improve the overall readability of the Arabic version of the survey, a few words (in a limited number of questions) in the Arabic version were modified. After the translation process was completed, the Arabic version of the survey was tested to ensure comprehension of all questions by participants.

3.5.3.5 Sampling Technique

According to Jankowicz (2005), sampling is defined as:

“the deliberate choice of a number of units (companies, department, people)- the sample- who are to provide you with data from which you will draw conclusions about some large group- the population- whom these units represent”. (p. 202)

Probability sampling (particularly simple random sampling) is an approach used in quantitative studies where every element in the population has a *known* equal chance of being selected as a subject in a study. This is the most rigorous sampling method which leads to high generalizability of the study findings (Sekaran and Bougie 2010). However, Leedy & Ormrod (2010) and Creswell (2012) argue that non-purposeful sampling approaches are appropriate for quantitative studies as long as a valid rationale is given. Further, Creswell states that “the research circumstances may dictate a form of nonprobability sampling” (p. 171). In this study, the researcher decided to use a purposive sampling approach that includes snowball sampling during the quantitative phase of the study for a number of reasons. First, the lack of a publicly available list of the entire Abu Dhabi population from which the researcher can draw a random sample made it impossible to use random sampling. Second, the researcher wanted to include individuals living in Abu Dhabi with different backgrounds including those with a lower socio-economic status. It was anticipated that such a group might be under-represented - or indeed not represented at all - had the researcher used simple random sampling from available lists comprising subsets of the total Abu Dhabi

population. The use of purposive sampling allowed the researcher to ensure that people from a low socio-economic background were represented. Third, as most individuals living in Abu Dhabi are new to the research culture and are not accustomed to responding to surveys, using a snowball sampling was deemed likely to increase the number of survey participants. In addition, snowball sampling encourages individuals who are naturally suspicious about filling out surveys to complete one if the survey comes from their trusted peers.

The qualitative phase of this study as described in Chapter Four revealed that trust is an important issue for many participants. To measure this domain, the researcher needed to obtain responses from different cross-sections of Abu Dhabi society.

Nevertheless, the researcher acknowledges that the cross-sectional nature of the data and the limitations of the purposeful sampling process may affect the generalization of the results. Future studies could overcome these limitations by adopting a more rigorous probability sampling process.

Sample Size

To determine the minimum sample size required, this research project used the formula presented by Tabachnick and Fidell (2007) for calculating the required sample size. Tabachnick and Fidell argue that the total number of independent variables studied determines the minimum number of cases needed: $N > 50 + 8m$ (where m = number of independent variables). Given that the proposed e-government adoption model in Abu Dhabi (see Chapter Five, Section 5.3.) to be tested has a total of ten independent variables (including four control variables), the minimum number of cases required, according to the above formula, is greater than 130.

In total, 231 questionnaires were collected, 34 of which were discarded and could not be used in the analysis because either the respondents were living outside Abu Dhabi region (21 questionnaires) or because large sections of the survey were incomplete (13 questionnaires) because volunteers did not provide an answer to all questions or they

left some sections blank. The final usable sample comprised 197 responses. Section 5.6.1 provides further details about the data screening process conducted prior to commencing the statistical analysis.

3.5.3.6 Data Collection

The quantitative data collection took place between February and May 2014. The survey invitation was sent to participants through email (see Appendix A - 10). The invitation email had a link to the information sheet (described in section 3.6.1 below) and a link to the online survey. The information sheet was attached to the printed survey for the participants who completed the paper-based survey.

Half way through the data collection period, a reminder was sent to those participants who had not yet completed the survey, requesting them to do so. In addition, all participants were asked to forward this reminder and a similar request to their contacts.

The researcher monitored the survey response rate regularly during the data collection period to identify any under-represented group. Six weeks after launching the survey, the researcher detected that individuals from low socio-economic backgrounds were under-represented. To ensure that responses from this group were obtained, the researcher targeted this group by distributing hard (paper-based) copies of the same survey questions. A number of survey papers were distributed by volunteers who live in an area of Abu Dhabi known to have a large lower socio-economic population (group accommodation provided by different companies for members of this group). The returned responses were entered into Qualtrics by the researcher.

Before the researcher decided to close the survey, the responses obtained were checked to ensure that the different sectors of the Abu Dhabi population were represented. Given that the number of usable responses obtained exceeded the minimum number of responses required, and that the sample was a good representation of the Abu Dhabi population with respect to employment status,

gender, age group, the researcher concluded the data collection process and began to analyse the results.

The details related to the practicalities of quantitative sample including participants demographics compared to the wider Abu Dhabi population is presented in Chapter Five, Section 5.5.

3.5.3.7 Data Analysis Procedure

In order to test the relationship between the factors influencing end-users' adoption of e-government as independent variables (the outcome of phase I) and the use of User Behavior as dependent variables, the researcher used Structural Equation Modeling (SEM) as the preferred statistical technique. Stragier et al. (2010) state that this statistical technique allows researchers to test assumptions regarding the strength of the relationships between indicators (questionnaire items) and the latent variables (the concepts), with a simultaneous estimation of the correlations between the concepts.

The Statistical Package for Social Sciences (SPSS) version 22 was used to complete the screening and analysis of the questionnaire, performing descriptive statistics tests, exploratory factor analysis tests and initial results validity and reliability tests. In addition, AMOS (Analysis of Moment Structures) software was used to perform a number of additional statistical analysis tests including confirmatory factor analysis and structural equations modelling, the details of which are presented in Chapter Five, Sections 5.7 and 5.8.

3.5.3.8 Summary of the Quantitative Phase

This section described the research approach followed during the quantitative phase. The section began with the researcher's reasons for choosing the quantitative approach as an appropriate research method for this phase. Then followed a description of the research instrument design and its validity, the approach taken in translating the survey questions to the Arabic language, the sampling technique used

to recruit study participants, and the data collection and data analysis procedures adopted.

The rigour of the quantitative phase was established by: first, following Straub's (1989) recommendation to ensure that the survey instrument designed and used to collect the quantitative data is both valid and reliable as described in section 3.5.3.3; second, translating the study questionnaire using a rigours process as described in section 3.5.3.4; third, using a representative sample that draws participants from different Abu Dhabi residents population as described in sections 3.5.3.5 and 3.5.3.6; and finally, using the SEM procedures described in section 3.5.3.7, to perform the different statistical analysis tests used to arrive at the study's conclusions, including EFA and CFA. All these procedures contributed to the rigour of the quantitative phase and indeed to the overall rigour of the study.

3.6 Ethical Considerations

To ensure that this research complied with the ethical standards set by the National Health and Medical Research Council (NHMRC) in Australia, the researcher reviewed the National Statement on Ethical Conduct in Human Research produced by the NHMRC prior to applying to the Human Research Ethics Committee (HREC) at Curtin University for ethical approval for phases one and two of this project. The HREC examined the applications submitted by the researcher for both phases and the study was classified as low risk. Approval to commence the project was obtained (approval number is IS_10_15 and IS_14_06 see appendix A - 1 and A - 2).

3.6.1 Informed Consent

Before the researcher collected any data from the study participants, each participant was given an Information Sheet explaining the aim and objectives of the research project as well as the rights of the participants. The information sheet was given to each participant again prior to the start of each qualitative interview. Similarly, the information sheet was given to each individual invited to take the survey by attaching

the sheet to the survey invitation email or by physically attaching the sheet to the printed questionnaire.

The Information Sheet clearly stated that all participants have the right to the following: first, they could decline to take a part in the study; second, decline to answer any specific question; third, withdraw from the study at any point of time after their initial agreement to participate; fourth, ask the researcher any questions about the study at any time during their participation; fifth, be acknowledged for their cooperation and contribution in a way that retains confidentiality unless otherwise requested.

3.6.2 Confidentiality and Anonymity

The researcher is aware of the potential harm to participants, discussed by Marrett et al. (2003), that can occur in social research due to a breach of confidentiality. Having this in mind, protecting participants' confidentiality was a major issue in this study and assurances were given that published results would not identify the study participants. The researcher made it clear to all participants that any published results would not identify them. Also, the participants were made aware that if they wished, they would be informed of the study results.

As described in the qualitative Data Collection section presented in this chapter, all interviews were digitally recorded. The digital recordings were transcribed by the researcher only to ensure that confidentiality regarding the participants' identity as well as the information they gave was protected. In addition, the identity of all participants was masked by assigning a pseudo-name to each participant's set of responses. Also, the identities of all individuals who completed the survey were protected. The researcher did not collect any personal data (such as name, date of birth or physical address) that could lead to the identification of a participant. Every possible effort was made by the researcher to maintain objectivity when analyzing and reporting on findings.

All raw data (in electronic format) collected during the course of this study was kept in a safe and securely locked cabinet in the researcher's university at Abu Dhabi Women's College (ADWC) in Abu Dhabi, UAE. After the completion of the study, all raw data collected would be stored safely and securely at Curtin University for a period of five years after the date of the thesis publication. Only the researcher and members of the thesis committee had access to the data during the course of the project.

4. CHAPTER FOUR: QUALITATIVE PHASE

4.1 Introduction

In this chapter, a full description of the qualitative approach used in this study is provided. The chapter starts by describing the environment in which the interviews took place, followed by the analytical method used. Then, a detailed description of the domain analysis technique used to analyse the qualitative data is provided. This is followed by presenting the findings of this phase of the study and highlighting the main domains that emerged from the data. The chapter concludes with a proposed conceptual model that explains the factors that influence the uptake of e-government services in Abu Dhabi.

4.2 The Interview Process

Section 3.5.2 in Chapter Three discussed the interviewing technique used in this study, the details of which are provided in this section.

The concept of ethnographic interviewing as a major data collection method for qualitative studies was introduced by Spradley (1979). There are two “distinct but complementary” (p. 78) processes involved in ethnographic interviewing: rapport building and eliciting information.

According to Spradley, rapport refers to a harmonious relationship between researchers and informants which implies establishing a sense of trust between the two parties to enable the free flow of information during qualitative interviews. Throughout the interviews conducted in this study, the researcher was conscious of the four stages of rapport development suggested by Spradley: apprehension, exploration, cooperation and participation.

In order to allay any feelings of uncertainty on the part of both interviewer and interviewee, (apprehension), and in order to commence the rapport-building process with participants as early as possible, the researcher took time to explain the research

objectives in detail during his first contact with potential participants. A copy of the Information Sheet was given to each participant to keep.

Before the start of the first interview, each interviewee was asked to read and sign the project's Consent Form where they agreed to participate in the study under the conditions set out in the Information Sheet and agreed to the interviews being digitally recorded. All participants agreed to do the interviews under both conditions; therefore, all interviews were transcribed in full by the researcher. This provided the researcher with an opportunity to: start an initial analysis of findings; record non-verbal clues; and prepare follow-up questions or clarification issues to present to the participants during the second interview.

Because a harmonious relationship of trust and acceptance between a researcher and the research participants allows for the free flow of information during an interview, the researcher followed the three principles suggested by Spradley (1979) that facilitate the rapport-building process. First, the study's aim and objectives, along with the interview duration, types of questions involved, the researcher's contact details and background as outlined in the Information Sheet (see Appendix A - 4) were explained again at the beginning of the first interview. Second, the researcher restated the key phrases and terms used by an informer (obviously without irritating them) to demonstrate an interest in what s/he contributes, conveying that his/her contribution is valuable, and presenting a non-judgmental attitude on the part of the researcher. Third, the researcher avoided asking questions that could be interpreted by the participants as judgmental, such as "why would you do that?" or "what do you mean by that?" at this stage of the interview.

In addition, to further facilitate the rapport-building process, the researcher conducted the interviewees at a place where the participants felt more comfortable (e.g. their homes, workplaces, any public places of their choice). Furthermore, it was brought to the attention of the researcher that some of the Emirati female participants might not feel comfortable participating in one-on-one, face-to-face interview with a male

interviewer as this is culturally unacceptable to them. Hence, all female Emirati participants were offered the option of participating in the interview in a small group rather than individually so they would not feel apprehensive about the interview. Two female participants expressed their wish to do so and therefore the interview was conducted accordingly.

At the start of each interview, the researcher asked what Spradley (1979) describes as *grand tour* questions such as “Can you tell me about your computing background” and “what do you generally use computers for?”, to enable the participants to move from the exploration to the cooperation phase of the process. Some of the probing techniques suggested by Russell (2000) such as (silent, verbal agreement, ‘tell me more’ ...etc.) were used to elicit further information from interviewees.

It was notable that the speed at which rapport was developed varied from one informant to another. While with some informants’ rapport was established quickly right from the beginning of the first interview, this took longer with other participants where the cooperation/participation stage of the process was reached towards the end of the first interview or, in rare cases, at the start of the second interview. At the end of each interview, the researcher asked each participant about his/her feelings regarding the interview to determine the stage of the rapport-building process that had been reached.

Once the researcher had sensed that an interviewee had reached the cooperation/participation stage, a more free discussion began to take place and informants started to assume “the role of teaching the ethnographer” (Spradley 1979, p. 83), at which stage valuable information about the interviewees’ experiences with e-government was elicited.

Before rapport was established, the researcher was cautious not to ask what interviewees might consider as sensitive questions such as their concerns when dealing

with government, and any issues they had experienced in previous encounters with government.

As each interview progressed, and in most cases after fifteen to twenty minutes into the interview, most participants began to take a more assertive role and introduced new information. In some cases, they even offered analytical views, reasoning and sometimes judgments about topics raised during the interview such as the success or failure of e-government services.

A few participants suggested that some of their friends, family or colleagues might be interested in doing an interview. In a couple of cases, participants who met the study criteria were recruited through another participant who had been interviewed.

According to Cooper (2001), a well-designed qualitative research study is reliable and valid because a number of different strategies have been used. These involve collecting data at various times, in different spaces and from a number of different sources. The potential participants of this study included Abu Dhabi residents from different countries with different backgrounds and the participants were interviewed at different times. This provided triangulation of different sources involving data, time and space, thus contributing to a reliable research design.

To mitigate interviewer bias, identified by Robson (2002) as potentially affecting data reliability and validity, all interviews were recorded (after obtaining participants' permission) to help validate the accuracy and the completeness of the information collected as well as to avoid interviewer data coding errors (Barriball & While, 1994). The recordings of the interviews were then transcribed, and returned to the participants. During the second round of interviews, participants were invited, and encouraged, to read the transcripts and discuss with the researcher any changes they wished to make.

Giving participants the opportunity to check and make changes to the transcripts served two purposes. First, it verified and authenticated the information provided

during the interviews as reliable, accurate and representing what the interviewees intended. Second, it empowered the interviewees to become more than just passive responders to questions. This opportunity enabled the interviewees to expand on, correct, verify and/or discuss the information and opinions given during the interview.

4.3 Analytical Method Used

Hatch (2002) state that data analysis is a systematic search of meaning. To ensure that the data was analyzed systematically, the transcribed data was analyzed using domain analysis technique suggested by Atkinson and Abu El Haj (1996). This technique is well suited for this study as it is based on the Spradley's (1979) widely adopted qualitative research approach which also informed the interview process. Leach and Onwuegbuzie (2007) state that domain analysis technique is one of the seven most commonly used data analysis techniques because the technique helps researcher in better understanding the qualitative data as well as the relationships among domains.

Although the domain analysis technique originated in the field of psychology, the technique has been adopted in different disciplines including Information Systems (IS). A number of IS researchers used this technique to analyze qualitative data in their studies for examples see the work of Dell and Marinova (2007); Williams and Nicholas (2009); Tow, Dell and Venable (2010) and Tow et al. (2011).

Indeed, Atkinson and Abu El Haj (1996) contributed a detailed guidelines that explains how qualitative data can be effectively analyzed using domain analysis nevertheless, the authors do not offer similar guidelines to deal with the validity and reliability issues of qualitative studies. Seale (2002) argue that an exposure to, or awareness of any well thought out methodological discussion, including the validity and reliability of qualitative research, is likely to enhance qualitative studies quality. In addition he stated that "if there is one thing that produce poor studies, it is a researcher who is blind to the methodological consequences of research decisions" (Seale 2002, p. 108). Hence, this study has been informed by Lincoln and Guba's (1985) qualitative

studies trustworthiness constructs as well as constructs' implementation strategies suggested by Shenton's (2004) (both discussed in Chapter Three Section 3.5.2.1).

Following Lincoln and Guba's recommendations and Shenton's suggestions, credibility in this study is established by: 1) selecting a well-established research method (in the form of the procedures employed in the data collection and analysis) that has been used in similar projects; 2) prolonged engagement with the study participants; 3) using Shenton's recommendations on recruiting informants to meet the purposive sample criteria of this study; 4) data sources triangulation by collecting data from wide range of informants in different time and space dimensions (Denzin, 1989 & Cooper 2001); 5) conducting "frequent debriefing sessions" (Shenton, 2004; p. 67) between the researcher and his supervisor. Also, as per Lincoln and Guba's recommendations, transferability is established by providing thick descriptive data.

Dependability and confirmability constructs are established by leaving behind the recommended 'audit trail' described Lincoln and Guba (1985) which shows the structured, systematic and rigorous approach followed during data collection, analysis and reporting outcome of the qualitative phase (see Figure 4-1) . The 'audit trail' in this study, and hence the study's dependability and confirmability of the study, is established by: providing detailed description of the project's qualitative phase (discussed in Chapter Three, Section 3.5); providing detailed description of the methods and procedures used in conducting the semi-structured interviews (Section 4.2); describing the analytical method used in details as well as describing how the analytical method was carried out to culminate the findings of the project (Section 4.3 and 4.4).

The approach of coding adopted in this study was based on identifying the 'units of meaning' found in an interview text rather than following a line by line coding approach. This approach was adopted following Howell-Richardson and Mellar (1996) recommendation that the researcher should bear in mind the purpose of the participants' remarks therefore whenever the purpose of the remark changes a new

unit of meaning is created. In addition to the recommendation of Dey (1993) that the underlying consideration when coding should be given to the relevant ‘unit of meaning’ which is conveyed by content rather than form syntactical structure such as words, sentences or paragraph (Henri, 1991).

This researcher is aware that applying the ‘units of meanings’ coding has the potential for coding subjectivity (Rourke et al., 2001) and is thus could be problematic in some research, especially that follows positivist paradigm. This part of the project follows an interpretivist paradigm and acknowledges that the potential for the researcher to be subjective when coding cannot be avoided. Nevertheless, it is also acknowledged that impacts of the researcher’s interpretation should be minimized by carefully analyzing the coded records to ensure that the domains derived accurately reflect the participants’ perspectives and not the researcher’s own bias.

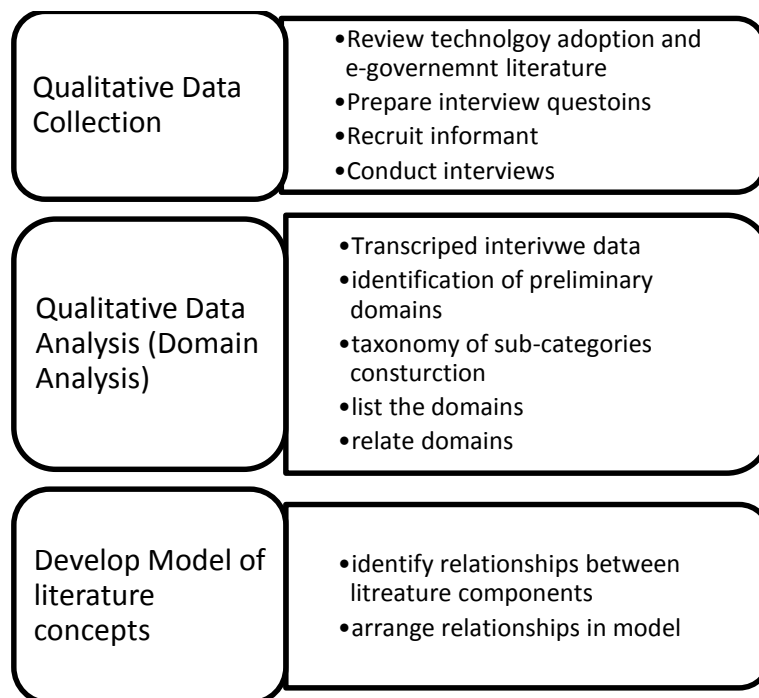


Figure 4-1: Qualitative data analysis approach.

To familiarize the reader with the domain analysis technique, the next section provides details about the four-step analysis that this technique involves as described by Atkinson and Abu El Haj (1996).

The first step requires the researcher to identify the primary domains which reappear in the discourse of each interview. Atkinson and Abu El Haj (1996) recommend that the researcher familiarize her/himself with the data and then code the interview text to identify a list of topics that emerged from the interview. The lists of topics produced by all interviews can then be collated to produce a preliminary list of the broad primary domains.

Once the primary domains are established, the second step is to identify sub-categories within each of the domains. This is achieved by arranging the actual interview texts into the primary domains, thereby allowing the sub-categories to be identified directly from the interviewees' own words. The participants' own words will indicate the issues that are most important to them rather than to the interviewer, thus giving the interviewees a "voice" (Denzin, 1989). The results of this step are presented as a taxonomy of sub-categories. To double-check that the categories under which the researcher has placed the qualitative data do reflect the topics of importance to interviewees, the taxonomy was given to informants to verify.

The third step in the process, as noted by Atkinson and Abu El Haj (1996), involves summarizing the interview content according to the key issues identified in the previous two stages. The results of this step are presented as direct quotations from the interviewees that highlight the issues they raised. Inevitably, there were some cases where classification was difficult because the quotation could possibly apply to more than one category; these were noted for future reference.

The fourth and final step in the domain analysis method is to identify the relationship between the primary domains and the categories identified in steps one and two of the

process. The difficult-to-classify quotations identified in step three were particularly significant in this step as these indicated a relationship between given domains.

After the completion of the domain analysis of the interviews, a model of the literature concepts was constructed. The constructed model gives an overall picture of the relationships between the different literature concepts in terms of influence. The model was then verified in follow-up interviews with informants who confirmed that the model reflected their experiences. None of those who did the follow-up interviews disagreed with the domain categories or the relationships between the domains.

Leech and Onwuegbuzie (2007) recommended that qualitative researchers use at least two of the seven commonly used qualitative data analysis tools: (1) methods of constant comparison, (2) keywords-in-context, (3) word count, (4) classical content analysis, (5) domain analysis, (6) taxonomic analysis, and (7) componential analysis, in order to triangulate qualitative study results and thus improve the rigour and trustworthiness of the results. While the analytical method used in this study satisfies this recommendation (by using the domain analysis and the taxonomic analysis) the researcher decided to use the classical content analysis as an additional analytical tool in one of the domain analysis steps to add more rigour to the process. The motivations for performing classic content analysis are: 1) to validate the preliminary list of primary domains obtained from step one of the domain analysis process by crosschecking each primary domain listed with the dataset to ensure that the concept is rooted in the data; 2) to reveal the preliminary primary domains that are the most important to the interviewees.

4.4 Findings and Discussion

4.4.1 The Interviewees

A total of sixteen Abu Dhabi residents participated in the interviews. The participants were selected to represent different nationalities, backgrounds and computing

backgrounds. Table 4-1 provides a brief description of the interviewees. Note that pseudonyms were used to preserve interviewees' anonymity.

A total of sixteen interviews were conducted between October 2010 and September 2011. The total time taken for all interviews was approximately 40 hours. Another 750 hours were devoted to transcribing them. All the interview transcripts put together resulted in just over 67,000 words.

Table 4-1: Participants' pseudonyms and descriptions

Pseudonym	Description
Jamal	Jamal is a key informant (Spradley, 1979) male from Africa in his late forties. He has lived in the UAE for the last five years. Jamal holds a post-tertiary degree and uses computers on a daily basis for work-related tasks as well as for emails, reading online news and communicating with friends and family.
Raja	Raja is a key informant male from India in his early fifties. He has been living in the UAE for the past 20 years or so; his highest educational achievement is high school. Raja uses computers for work-related tasks and to communicate with friends and family back in India. Raja started using computers in 1988 as the nature of his work required this.
Mai	Mai is a key informant female from the UAE. She has a higher diploma qualification. Mai started using computers when she was in high school and she uses computers to chat with friends and family and sometimes to shop online.
Brendon	Brendon is a key informant male from South Africa in his late forties. He has lived in the UAE for the last 10 years and he holds a post-tertiary degree. He is an experienced computer user who uses computers for a variety of tasks including shopping online and accessing online government services. He started using computers when he was in grade 9 or 10.
John	John is a key informant from the UK. He has lived in the UAE for the last 9 years. He holds a tertiary degree and he has an extensive computing background; he first started using computers when he was at university.
Amena	Amena is a UAE national in her early twenties. She is studying towards a higher diploma qualification. Amena started using computers when she was in high school, at the start her usage was limited and she found computers difficult, but now she uses computers frequently. She uses computers to communicate with friends and family online, as well as for work and entertainment purposes.
Sara	Sara is a UAE national in her early twenties. She is studying towards her higher diploma qualification. She started using computers when she was at high school, like Amena, at the beginning she was not doing much with

	computers and her computing skills were limited but now she uses computers frequently. She uses computers to communicate with friends and family online and for study. She would like to try online services in the future.
Ali	Ali is a male participant from Pakistan in his late twenties. He was born in the UAE and he recently returned to work. He holds a tertiary degree. Ali is an experienced computer user.
Nisha	Nisha is a female participant from India in her late thirties. She has lived in the UAE for the past 5 years. She is an experienced computer user who uses computers for a variety of work-related tasks as well as for communicating with friends and family, entertainment, and shopping online.
Jasim	Jasim is a male UAE national. He is in his early sixties with no formal qualifications. Retired few years back and he now runs his own private business. Jasim has never used computers but he would like to learn how to use computers in the future.
Diana	Diana is a key informant female from the USA and Egypt who has lived in the UAE for the last 10 years or so. She holds a tertiary degree and has an extensive computing background.
Hala	Hala is a key informant female from the UAE. She holds a tertiary degree. Hala started using computers when she was in grade 6 and now she uses computers on a daily basis.
Arwa	Arwa is a female from the UAE, in her mid-twenties and she hold a higher diploma qualification. Arwa started using computers in high school; she uses computers for variety of tasks including searching for information and online Arabic/English translation services. She used to do some shopping online but no longer does so.
Naomi	Naomi is a key informant female from Canada. She has lived in the UAE for the past 18 years. She holds a tertiary degree. Naomi started using computers in 1988; she uses computers on a daily basis for work-related activities, to communicate with friends and family and to shop online.
Kat	Kat is a key informant female from Ireland; she is in her mid-fifties and holds a tertiary qualification. She has lived in the UAE for the past 20 years. Kat uses computers extensively for various purposes including work-related activities, communication, and occasionally shopping online.
Khalied	Khalied is a UAE male in his mid-twenties. He hold a higher diploma certificate. Khalied uses computers for work-related activities, for entertainment and occasionally to book hotels and airlines online.

4.4.2 Identification of e-government Adoption-related Topics

This section documents the domain analysis, as described by Atkinson and Abu El Haj (1996), of participants' responses to e-government-related topics. The process commenced with identifying the primary domains, followed by documenting the sub-

categories that describe each domain, construction of taxonomic analysis of domain and sub-categories, and concluded with an analysis of the relationships between domains.

The next section describes each stage of this process.

4.4.2.1 Preliminary Topics and Primary Domains

In this first stage of the process, the researcher identified and listed the preliminary topics raised by participants during interviews. The researcher spent a considerable time going over the 67,000 + transcribed words, reading and understanding the interviewees’ comments. The interviewees’ comments were then coded, analyzed, and categorized into fifteen topics. Under each topic, the sub-categories related to the topic were identified and listed as shown in Table 4-2 below. After the preliminary list of topics was compiled, the researcher used the concepts listed to perform classic content analysis by counting “the number of times each code is utilized” (Leech and Onwuegbuzie 2007, p. 569).

Using the entire dataset, the annotations representing each preliminary domain concept were counted. Dey (1993) argues that content analysis could be expanded beyond the simple work count of a specific word to include attributes of keywords and surrounding words or phrases that explain a concept; hence, annotations were used. The result of the analysis is shown in Table 4-2

Table 4-2: Preliminary topics discussed during the interviews

Trust in e-services / Trust in Government:
Concerns about online payments, trust in government, trust in government systems, prefer to talk to a human, trust in government lead to trust in their services, location of the e-services influence my confidence, trust reputable organizations/websites, online experience affect trust level, prefer to deal with gov. directly (not through third party), I just trust it.
Security:
Security of personal information concerns, concerns about credit card usage online, worried when online, online transactions not safe, email been hacked or subjected to spam, security of government websites, offline transaction is safer, big businesses /gov. websites are secure.

Privacy:
Personal information privacy concerns, leak of personal information, prefer to give personal information in person, check website's privacy policy, I trust government with my private information.
Social Influence:
Rely on friends and family recommendations, word of mouth, support /supported by friends online, others online experiences affect me, family members deal with the government on my behalf.
Computing Background / Experiences:
Using computers for different tasks (work, email, news, entertainment, communication, search), accessing online government services, shopping online, use computers daily, limited usage, online banking, lacking of computing skills, enjoy working with computers, had negative experiences previously, the role of computers in the future.
User Intention:
You get more benefits during face to face meetings, more comfortable giving personal information offline, prefer to do it online, older generation prefer face to face, no difference, occasional use of online services, people here like face to face communication, I had no choice, will do it online only if I have to.
Advantages:
Save time/money, disadvantaged when persuasion/clarification is required, need, being informed, online is not complete.
Cheap:
Motivated by saving money and time, it is cheaper online, confidence in a website is more important than cheaper prices.
Convenience:
Don't like to go to government offices and wait, it is faster online, online saves time/effort.
Easy / Difficult:
Online is easier than going in and queuing, it was easy to use, it difficult to use, difficult to find what you want online, shopping online was easy, they should make it easier for you.
Control:
Allowing me to check the progress of my application, the service gives me control, I am informed all the time, I like to be in control of it.
Accountability:
Who will take the responsibility if a mistake happens online? When I submit the application face to face I've given it to this person, Asian governments are corrupt, more accountability in the UAE, government officials are not corrupt in the UAE.
E-service Location:
Don't trust websites outside the country, the UAE is new to e-commerce, using e-services depends on the country in which the service is offered, some services are not available here.
Confidence / Lack of Confidence:
Competence of government employees, confidence in e-services is affected by previous online experiences, lacking confidence in online government systems, having more confidence in papers, happy to use online gov. services, will not risk it.

Online / E-government Services Usage:
Lack of awareness about the services, only use e-services when it is compulsory, government websites lack adequate information, information overload, technical difficulties with the website, waste of time, limited services available in the UAE, afraid to make a mistake, prefer offline, prefer online.

Table 4-3: Preliminary domain analysis results

Category	Number of comments
Computing Background and Usage	111
f2f / Online Preference	107
Trust	95
Security	71
Confidence / Lack of confidence	69
Online/ e-gov Services	58
Friends/Family Influence	55
Convenience	50
Relative Advantage	46
Location Matters	33
Privacy	27
Accountability	13
Cheap	11
Easy/Difficult	10
Control	5

As noted previously (in section 4.3), while the domain analysis technique does not require such crosschecking, the researcher felt that this was a necessary additional step to ensure that the preliminary list of primary domains arrived at are valid before progressing to the next step in the domain analysis process.

The categories *Trust in e-services/Government* and *Convenience* attracted the most comments from the interviewees. Comments related to these categories were made by all participants (i.e. these categories were mentioned in each interview by each participant). Other categories that were mentioned by almost all participants are: *Computing Background and Usage*, *User Intention*, *Confidence/Lack of Confidence on e-government Services*, *Security*, *Friends/Family Influence*, *Advantages*, *Location Matters* and *Online/e-government Services*. *Computing Background and Usage* category attracted the most number of annotations (i.e. in all but 1 or 2 interviews). That was not surprising because all

interviewees were invited to share their computing background and experiences at the beginning of each interview.

The remaining categories, *Privacy*, *Cheap*, *Accountability*, *Easy/Difficult*, and *Control* were referred to less frequently. These categories were further analyzed to identify broad themes or “domains” under which the preliminary topics listed above can be grouped. As a result, the various preliminary categories were grouped according to several primary domains as illustrated in Table 4-4.

Table 4-4: Primary domains in relation to e-government adoption

Perceived Online Safety
Online Experiences
Individual’s Significant Others
Motivations
Trust in e-government
User Intention

4.4.2.2 Primary Domains and Related Sub-categories

4.4.2.2.1 *Perceived Online Safety*

The first domain that emerged from the data was *Perceived Online Safety* which groups together comments related to the participants’ worries and concerns about the possibility of what they perceive as “sensitive” information being compromised online. Many participants related their online experiences when conducting an e-government, e-commerce or both transactions. Comments focusing on issues related to credit card and personal information, and the security and privacy of personal information, were common. What was considered “sensitive” information and the sentiments towards revealing such information online varied from one participant to another. Comments relating to the risks of conducting online transactions were among the most discussed topics during the interviews. Typical participants’ comments, concerns, and worries about revealing credit card details online are shown below:

“If we are going to use credit card then we have to be concerned, is this good website or what if something happened! We worry about the credit card but other information like what is your name, passport number, phone number these kinds of things are okay, I don’t worry about it.” (Raja)

“my father is scared to use online services if it needed credit card information he doesn’t feel comfortable” (Mai)

“Even when I find anything [product] that is interesting and has good quality I follow the process until they ask me for my credit card number then I say no... on... no... I don’t want it, I don’t trust them.” (Sara)

Some participants consider online transactions to be unsafe and they were reluctant to provide credit card information details online as illustrated by the following participant’s comment:

“I don’t know may be the website is not secure! They might use my credit card number for anything else, how can I trust them? If I can order and pay on delivery then that is okay but to pay online No.” (Sara)

A group of the participants, who were relatively computer savvy and had more online experiences, were less concerned about the security of their credit card details online. The comments made by Brendon, who has a strong computing background, extensive online shopping experiences, and uses e-government services often, represents the opinion of this group.

“I don’t have an issue with security, because before I go to the website I check that it has encryption and it’s a secure website that uses certificates. So I’m not too concerned about revealing my credit card details online because I trust these companies.” (Brendon)

Many participants had doubts and concerns not only about their credit card information security but also about the security of their personal information online. The following comments illustrate such concerns:

“It is an issue really because you fill a form online for example you never know where it is going. That form is there you never know how many copies people are going to make. But if I had my hard copy in my hand I know that is the copy I have and that is the copy I am taking to somebody. It is not the same as I am

filling it online, online you never know somebody can hack into the website of that organization and get information about you.” (Jamal)

“I have heard about lots of crimes online people can take your photos they can take your personal information” (Mai)

Further, some participants commented that the risk of personal information security breach is not only limited to online transactions, but also occurs offline as noted by the following participant:

“Anywhere where you passing over personal information, personal details it’s at risk, whether you put it online or you giving it to individual it’s at risk” (John)

On the other hand, a group of participants appeared less worried about the security of their personal information when accessing online services in the UAE because they are living in the same country where the service is being offered. The reasons given for such confidence in online services are summarized in the following comments:

“if it is within our country and it’s a known government company yes I will trust okay. I don’t worry if it’s within our country.” (Hala)

“if I was dealing with a company here online, because I am on the ground maybe I may just consider doing something like that because we are all here in the same country. If there is a need to go to the court for anything we are all here, so compared to if we are somewhere else in another country and suppose there is a problem and you start going to courts how do you deal with that if you cannot reach them” (Jamal)

In addition, a group of participants do feel “safer” when dealing with large reputable online companies. The following comments represent typical sentiments of this group:

“some of the shops are really big and they have authentication stamp so I feel it is safe and I will buy from them, if I am not sure I will not buy.” (Arwa)

“if it is a shop that has a name and it is gullible, it is very gullible, I just trust them” (Kat)

Concerns about the privacy of personal information online have been raised by the majority of participants. Some participants commented that in the past they submitted

personal information in confidence to government and non-government organizations, yet this information had been leaked and ended up in the hands of a third party organization. The following are comments that typically illustrate the concerns of this group:

“I do worry about the privacy of my personal information because there are times when they might ask what is your office phone number, what is your mobile number and there maybe sometimes later somebody calls me unsolicited and knows me by name! Many things like this happen so you think how did they get my information? Does the company itself pass on the information? Did they sell it as possible leads for selling their goods and services? Or is it the employees themselves? They have got access to database they can easily print out an email list, a telephone list and they could sell it to another company?” (John)

“...if I am signing up for a website here my information will be spread around like a flash and that is not because the consent from is not presented online, it is, you sign to NOT but it never does! It always end up somewhere else, this is personal experience I am talking about here.” (Ali)

Another group of participants, most of them women from the UAE, were more concerned about revealing personal information such as photos, email addresses, contact details online, as they consider such information to be “sensitive” information. The following comments express the participants’ feelings about revealing personal information online:

“Like something that requires sending my picture I would consider this sensitive information. And even my mobile number, as a lady I never put my mobile number in any document I put my brother’s or my guardian’s phone numbers just to be on the safe side.” (Mai)

“The problem when they ask for my credit card I will stop and think maybe my credit card details will be revealed to other people, my personal information such as my name, address ...etc. will not be confidential you never know”. (Amna)

“it depends on the website, I remember I was putting false mobile numbers and false email in some websites” (Hala)

However, it was noticeable that most of the participants were more comfortable providing their personal information to an online government service rather than to

an online business. The feeling that government is likely to protect their privacy more than would a commercial organization was common among the participants as illustrated by the following comments:

“I think it is going to be in safe hands, I am not worried if it is a government agency and we all know it is a government agency I don’t think they are going to misuse your information, I don’t worry too much.” (Diana)

“It is impossible that they [government] will put a website unless they are sure the website is okay, they will make sure it is secure, cannot be hacked, no one can steal anything for the website and all information are confidential, but for other websites there is no guarantee.” (Sara)

4.4.2.2.2 Online Experiences

Individual’s Online Experiences is the second domain which groups together comments related to the participants’ computing experiences, attitude towards computing, and awareness of online government services offered. Participants’ computing experiences varied from skilled, computer literate participants who use computers on a regular basis to perform a variety of tasks (e.g. email, work-related, communication with friends, online banking, searching for information, entertainment ...etc.), to participants who do not use computers at all due to lack of skill, desire or age. Some participants fall in between; these people indicated that they use computers occasionally when needed and they have moderate computing skills.

The fear of making a mistake online was noted by one of the participants as one of the reasons why her father was concerned about conducting transactions online.

“he said may be I will do a mistake online or something.” (Hala)

Prior technology adoption research presented in Chapter Two of this study showed that one of the factors that influence the uptake of technology is the adopter’s attitude towards technology. The majority of participants were excited about technology and

they showed a positive attitude towards online services, as indicated by the following comment

“I think everything is going towards electronic services, this is the Internet time, everything is in the internet even newspaper are online, the important news comes directly to your mobile.” (Khalied)

This positive attitude to technology usage was also shared by participants who are currently not using computers or online services. This group of participants was also enthusiastic about the future use of technology in daily life, as illustrated by the following comment:

“I didn’t use computers but from what I’ve seen in the future we might not need papers and stationaries, computers will enable us to do a lot of things, all transactions will be done through computers.” (Jasim)

However, one of the participants was not as enthusiastic about the prospects of using technology to access online government services. He stated:

“I can see with how things are going that in the future every government is going to go online, it is a time bomb in my own opinion they will all go online and something is going to happen and everybody will be nowhere and we will go back to square one you know. So for me I think the old fashion way it has to be changed I am not against technology we can have as much technology as we like but I will want technology to go hand in hand with the traditional way you know” (Jamal)

The majority of participants who indicated that they do use online services stated that they use them to buy products or services. Only very few participants extend their online experiences to interacting with government using online services. Comments describing the lack of awareness of the range of online government services offered in Abu Dhabi were common. Many participants mentioned that they either did not know that the services existed or they did not have enough information about them. The following is typical of participants’ comments:

“There is not enough information about online services here not in the media, not through other people’s experiences. Since I moved here I did not often heard people saying hey today I went to this website.” (Ali)

The majority of interviewees said that they were hearing about the Abu Dhabi government gateway (www.AbuDhabi.ae) for the first time during the interview. This lack of awareness is highlighted by the following comment:

“It is not only us, by the way many people in the UAE society in general don’t know about this [Abu Dhabi government portal].” (Amna)

Another participant added:

“The problem is that no-one told us about how government services work, what happens if something goes wrong with the transaction, what should I do then? Some people don’t know even that the services are available online.” (Sara)

4.4.2.2.3 *Individual’s Significant Others*

Individual’s Significant Others is the third domain which groups participants’ comments according to the influence of their social surroundings (significant or important others) on their behavior online. The majority of participants commented that friends and family members are the main sources they rely on to obtain information about the services that can be accessed online and how to access these services, as shown by the following participant’s comment:

“My first experience with buying things online was when I saw a package arriving to my friend. She told me how she purchased her stuff online. She said if you go to Aramax they will give you like a master card and a PO Box to use both in the States and in the UK and she showed me the things she bought and it was half the price of what we get here!” (Mai)

The *Individual’s Significant Others* role is not only crucial for sharing information and personal experiences online about what to do and where to go online, but is also important for establishing trust in a certain online service. The majority of participants stated that their friends and family give them confidence in certain online services and ultimately influence their decision about whether or not to use the service. Very few

participants stated that they would be the first to try a new online service; the majority stated that they always seek others' recommendations before trying a new online service. Many stated that they would not conduct an online transaction unless it had been endorsed by people they know and trust. This is illustrated by the following comments:

“I always get my information from acquaintance like one-on-one, I never use a website or buy from a website that has never been used by someone before. I rely on other people, word of mouth.” (Diana)

“For the first time, I am not going to do an online transaction on my own. I need information from someone who knows the website and says it is okay you can use it” (Raja)

“I always go with recommended websites by my friends.” (Mai)

In addition, some participants do not rely only on word of mouth to establish the trustworthiness of an e-service; they seek others' written opinions and reviews, and heed others' previous experiences with the online service as illustrated by the following comment:

“I look at the reviews first and then if I am not sure I ask friends, and if I've got friends who would say yah no problem I would go by their word ... it works ... it works, but if they say no stay clear or if I look at feedback and there are lots of complaints I will stay clear.” (John)

Some participants stated that they support their social surroundings online by either giving others access to an online payment credit facility:

“Sometimes I will be shopping for my friends not only for me because they did not have the internet card [pre-paid credit card]” (Arwa)

or, by accessing online services on behalf of their friends and family due to the latter's lack of computing skills or language barriers as illustrated in the following comment:

“When my mum lost her ID she told me go online and check if she can apply for an alternative ID online. My mum doesn't speak English and she is not

comfortable in using computers so she was the one who told me to log on and check about the ID cards, she does a lot of shopping online through me.” (Mai)

It was noticeable during the interviews that Emirati female participants rely on a male family member (father, brother, husband or uncle) to interact with the government on their behalf. They attributed this to convenience and/or cultural restrictions as illustrated in the following comment:

“Most of the things like the ID cards, passports renewal my dad does all those.”(Mai)

One of the participants asserts that while some families have no issues with allowing their female members to go to government offices, others have reservations:

“There are restrictions, most of these places are mixed and there are a lot of local people there but for us [Emiratis] your father, your husband or your brother will go and do these things for you. I don’t need to go there and do it. But I know few of my friends they go and do it themselves even when they want to renew their passports they go there to do it but for me my father will do it or one of my brothers. For other families they don’t want their daughters to go to mixed places they don’t even allow their daughters to work in some places.” (Hala)

4.4.2.2.4 *Motivations*

The fourth domain describes participants’ *Motivations* to use online services. Participants who used online services cited different reasons for going online. The majority of the participants stated *convenience*, *need* and *control* as the main incentives for online interactions. For example, the relatively faster tax returns processing time online motivated the following participant to opt to do his tax return online as illustrated in the following comment:

“They have started a new service of submitting tax returns online in South Africa. I’ve used that, and there again a very fast turnaround time was noticed. Normally a tax return would be processed in 2-3 months, but this online tax submission was processed within 2-3 weeks.” (Brendon)

Others are motivated by the time-saving aspect of online transactions. They do not have to wait in “crowded” government offices as illustrated by the following comments:

“because these places are crowded, so many people waiting and queuing, you need to take a ticket and wait may be for more than half an hour, also no parking there.” (Sara)

“e-government saves everybody’s time, I don’t need to go to or speak to anybody to get my stuff done” (Ali)

The theme “online services are convenient” was shared by a limited number of participants who had used online government services at least once in the past. An example of comments that highlight this theme is expressed by one of the participants who applied for an entry visa to the UAE for one of his relatives through an online service. He was convinced that despite the large number of documents required to be prepared and uploaded online, the online application process is still more convenient than going to the local immigration office as noted in the following comment:

“It is still very convenient and I would do it again.” (Brendon)

Also, the convenience of online services encouraged a number of participants to use e-commerce online services as noted in the following comments:

“I don’t want to go around and go to the places, find parking and stay on the line, I prefer online.” (Naomi)

“So its convenience, cost factors, there is a wider range, it saves me time going around to the computer shops to see if they have it or not.” (Brendon)

However, some participants stated that they would rather be inconvenienced by going to see government officials face-to-face than take risks online, particularly when dealing with a government agency in which they have little confidence as expressed in the following comment:

“I will not risk it I will go in person regardless of the fact that it might be busy. I don’t have enough trust yet on the online system there.” (Diana)

On the other hand, others are willing to take the risks online rather than being inconvenienced:

“Well I just like the convenience [of the service] so I take the risk.” (Naomi)

The positive attitude towards e-government services extended to non-users of online services. The majority of participants who mentioned that they did not try online services nevertheless showed positive attitudes toward the services and stated that they would like to try them in the future. They believe online government services are convenient and quicker and would save them time as illustrated in the following comments:

“Yes I would like to use computers. They make things easier, they are accurate, it is good to use computers... they make things easier.” (Jasim)

“Online services make things easier and you save time, now a days everything must be done quickly.” (Sara)

4.4.2.2.5 *Trust*

The fifth domain of grouped comments related to participants' *trust* in e-government services. Participants' comments were mainly focused on three aspects of trust: trust in government employees, trust in online government systems and trust in the implementation of government rules and regulations.

Participants' attitudes and feelings towards government employees' customer services abilities and competence attracted a number of comments. The comments varied: some perceived government employees as unhelpful and that the customer services in some government departments were inadequate and needed to be improved in terms of employees' ability to provide information, explain application processes, explain what needs to be done, and answer customer questions. The following comments indicate these concerns:

“they did tell me what I needed to do but I find that it takes sometimes more than one person to let you know what is happening. A lot of time they ask each other,

it seems everyone does not have enough knowledge, but collectively they can answer your question well.” (Diana)

“Here they treat you like you are annoying them! So that customer services aspect is missing whether when you phone up or go face to face still it is like they want to get rid of you rather than serving you! whether is it a language thing or cultural thing I don’t know, yah the customer services still need to be enhanced here I think in a lot of areas.” (Kat)

However, another group stated that they have observed a noticeable improvement in employees’ attitudes towards customers as suggested by the following comment:

“I really think they have improved in their customer service and in their politeness they really improved. I did notice a big improvement at the beginning I wasn’t impressed at all you know.” (Naomi)

Some of the participants voiced their concerns about the lack of adherence to government processes and procedures by several employees in various government departments in Abu Dhabi as illustrated by the following participant’s comment regarding his application for entry visa.

“it depends on the mode of the officer who is sitting there, that I observed a lot here. . If they are in a bad mood, that is it. It might not be true all the time but especially jobs related to the government whether you go to (government department) or you go to (government department)” (Nisha)

One of the participants expressed his lack of trust in government officials in an Asian country as illustrated by the following comment:

“If you want to do small thing in (country name) you need to pay someone money. If you don’t pay there will be no response, nothing would happen they [employees] will move you from one person to another it is very difficult.” (Raja)

Many participants expressed their lack of trust in third party agencies that act on behalf of a number of government departments for the collection of data and payments from Abu Dhabi residents. Their concerns focused on the privacy and security of their

personal information as illustrated by the comments of the following participants who had recently used the services of one of the typing centers³ in Abu Dhabi.

“I felt a bit uncertain about it you know; this is a third party getting personal information about me! I went to this office and there was two people there one guy was doing all the details and the other one was doing the actual typing and translating. He said it’s going to be a little while and he said OK leave your passport and come back in half an hour. I said no I’m not leaving my passport and said if you like you can have some photocopies I left some photocopies. Even the photocopies I wasn’t that happy about because there were lots of people coming in and out you know anyone could’ve took copy of this I don’t know what they could do with a photocopy but there is a problem with identity theft you know... when I come back they wanted to scan the original passport while they were doing this I was watching what was going on” (John)

“The typing offices have employees from different nationalities. You don’t know who really works for them, or who is volunteering or working part time he can take your information, you passport copy!” (Sara)

A number of participants also commented on government’s online systems/services focusing on the information quality, accountability online and the technology used. The quality of information in terms of language used, clarity of instructions, completeness of information ...etc., in government online services attracted a number of comments. For example, one of the participants had the following opinion about the online content of Emirates ID:

“The instructions about what I had to do were very clear.” (Mai)

While another participant had a different view, stating:

“I remember when we filled the information for the ID card; the information was in English and Arabic it was confusing if they separate them it will be better. Some of the information was not clear for the users.” (Hala)

³ Third party organization that government departments use to complete data entry and fee collection for services they offer.

Many of the participants were concerned about who would be answerable if an online transaction went wrong. These concerns highlight the issue of a perceived lack of accountability regarding online transactions. The following participant's comment summarizes the participants' concerns in general:

“I think the main thing for me, I don't know about it for other people, is that single person you can hold responsible if things go wrong. If I meet in the office face to face with somebody and I spoke with them when I was putting my application or whatever it is, I know that person I know their name so should something go wrong I can clearly say on so and so day I met this person I did this and I did that, online who do you see? There is nobody there? There is no single person there you can say this is the person I submitted my application to, you did it online to who?” (Jamal)

The use of latest technologies by governments in delivering government services has been acknowledged by the majority of the participants. However, several participants had some doubts about the efficiency and reliability of the technology as highlighted by the following comments:

“Completing application forms by hand just gives me a peace of mind because with this technology you can never tell. You may be fill[ing] the form, in the middle of the process the computer crashes or something happen to the computer after spending hours and hours filling these forms. While if I am filling it by hand I know what ever is there will remain there, you know nothing is going to happen to it,” (Jamal)

“I think they are more high tech here they are more aware of more systems here maybe because they have the money whether they use them efficiently or not I don't know.” (Kat)

The perceived reliability or otherwise of online systems attracted a number of participants' comments. For example, one of the participants was reluctant to settle her traffic fines online because she was doubtful about the accuracy of government online systems. She said:

“Maybe they will not update their system, I might pay and they might say you did not pay. There is no evidence of the payment.” (Amna)

In addition, another participant had her doubts about the accuracy of one of the government department's online system, stating:

“The technology when I was at their offices was not working well because it showed my fine in one system differently than what was recorded in another system! They were working on it in their offices to actually make it happen so I am a little bit doubtful if it is going to work online if it is not worst.” (Diana)

Zabeda (2007) states that would enhance the perception of a government being trustworthy by providing quality services to citizens, addressing citizens queries in a timely fashion and giving them appropriate feedback, putting in place effective policies and procedures as well as maintenance transparency and low levels of corruption in the government. In this study, the participants' comments suggest that trust in government and trust in government online services are linked. One of the participants said she has no issues paying online using a government e-service because she trusts her government.

“It depends on the website, if it is a government website is okay I will pay online. Once I paid for my traffic fines online.” (Sara)

Another participant mentioned that because of his mistrust in the government system in his country of origin, any e-service initiated by that government is likely to be mistrusted too:

“I don't want to make generalizations, in my country the government is not that popular. People don't really trust the government. When the government tries to introduce these new schemes like e-government schemes, people are a bit resistant and a bit skeptical about the intentions of the government.” (Brendon)

The following comments indicate that participants' confidence in e-government services was strongly linked to confidence in the government's reputation, accountability and transparency:

“Because the online service belongs to the government and the government has to maintain its reputation and we trust them. It is impossible that they [the

government] will put a website unless they are sure the website is okay, they will make sure it is secure, cannot be hacked, no one can steal anything for the website and all information are confidential, but for other websites there is no guarantee.” (Sara)

“If the online service is here in the UAE, if it is immigration for the visa purposes I will pay online, I’ve no problem I trust they will not cheat... In (country name) people definitely will not pay online even if it is a very small amount, even if you pay it might not go to the government!” (Raja)

“I do have more faith in the USA government because I think if somebody makes a mistake somebody is going to be hold completely and totally accountable for it and that makes you more responsible and more accountable and that is more reliable in the long run.” (Diana)

4.4.2.2.6 *User Intentions*

Finally, the sixth domain is *User Intentions*, which groups together comments regarding participants’ intention to adopt e-government services. The participants expressed their intention to use online services by sharing with the researcher which approach they would prefer to use when they communicate with government. The participants’ comments indicated either face-to-face or online preferences. It was noticeable that the majority of participants preferred to interact with government face-to-face, showing their intention to communicate with government using the conventional approach. The reasons given for such preference varied. Some participants cited the lack of trust in online systems was their reason for wanting to communicate with officials face to face as indicated by the following comment:

“I prefer to go to the office and see the person in charge and talk to them about it, yah. Because it is not the same you know, if you do it online and you are there looking at somebody talking to them.” (Jamal)

“I think they don’t want to look at technology they want to have a real person, a real face” (John)

Another reason given for preferring to interact with government using the conventional approach is that participants feel that they would be disadvantaged when dealing with government online, as illustrated by the following comments:

“when I go in person I will be more connected with the person I am dealing with but online I feel that they just collect papers, I don’t know if they will look at it or not” (Amena)

“I will prefer face to face okay. I think when I see someone face to face and let us say I have a missing paper or something maybe I can talk to that person and he will say okay. ” (Hala)

“When you go face to face there a lot of things you can read, impression, body language, you can read those when you go there rather than just go online.” (Jamal)

Many participants expressed their intentions to contact government using face to face approach because they thought such approach would be better if they need to make a case, ask questions or seek clarifications as noted in the following comments.

“If you have a problem or you want a question answered then I think you have to go face to face here.” (Naomi)

“If it something major involving a large transactions in terms of money I would like to see somebody’s face.” (John)

Others, preferred face-to-face communication because they perceived after meeting with officials that they can have a “proof” or confirmation that their transaction has been completed as illustrated by the following comments:

“When you meet someone you are sure you can say I give my application to this person, if you put the application online everyone can say no I did not receive the application it is with another person.” (Amena)

“Although my mother knows how to use the machine to pay Etisalat bill, we explained to her how to use the machine many times, she prefers to go to Etisalat in person, find a parking, and wait in line to pay a bill. Although we can pay the bill using the telephone, or the machine or over the Internet she insists on going there to get her bill stamped. She can wait for an hour to get the stamp.” (Sara)

One of the participants who prefers to use the conventional approach to communicate with government stated that he will use online services only as a last resort and if there is no other option:

“If I am desperate and I have no other options you know of course I will have to do it [use online services]” (Jamal)

On the other hand, the participants who expressed willingness to use and accept online government services and preferred to conduct their transactions online rather than face-to-face cited convenience as a major reason for their choice as illustrated by the following comments:

“I prefer online so that I can fill the details, I can bring the document they want and I can see how much it will cost.” (Raja)

“I don’t want to go around and go to the places, find parking and stay on the line, I prefer online. Convenience! ” (Naomi)

“You can do online transactions in your own time in your own space you don’t have to drive somewhere to go there, you don’t have to find parking there, it is easier to do it online, that would be my choice.” (Kat)

The relationships between these six domains are discussed in the following section, in which domain taxonomy of e-government adoption is presented and discussed.

4.4.2.3 Taxonomy of e-government-related Sub-categories

The grouping and sorting of the actual text from the interviews into the relevant primary domains resulted in the development of a taxonomic analysis of e-government adoption. The recommendation of Atkinson and Abu El Haj (1996) for this phase is to group actual phrases together and allow “the identification of the sub-categories to emerge directly from the interviewees’ own words” (p. 439) thereby representing the topics that are most important to the interviewees. The taxonomic analysis of topics related to e-government is presented diagrammatically in Figure 4-2.

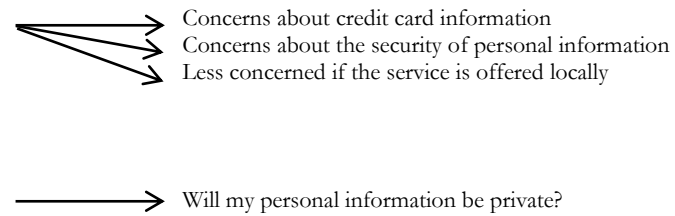
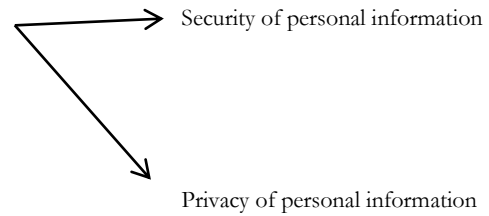
4.4.2.4 Relationships between e-government Adoption-Related Domains

The last stage in the domain analysis approach employed in this study involved identifying the relationships between the primary domains by seeking statements within the collection of interviews data that relate one domain to another in terms of either influence or priority as recommended by Atkinson and Abu El Haj (1996).

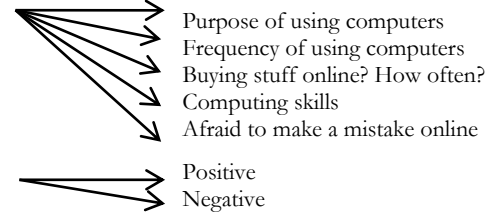
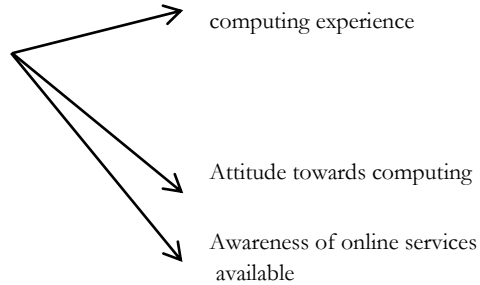
DOMAIN

SUB-CATEGORIES

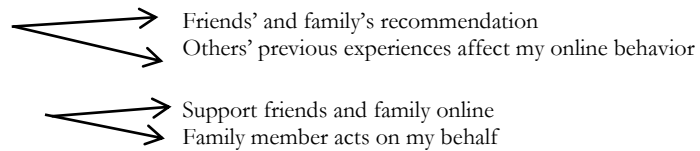
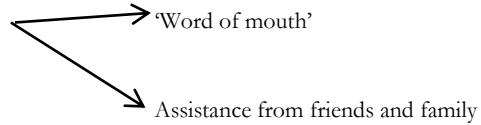
Perceived Online Safety



Individual's Online Experiences

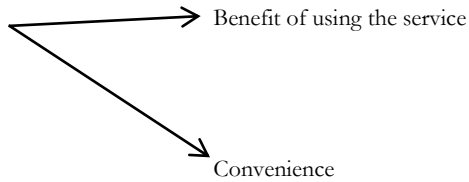


Individual's Significant Others



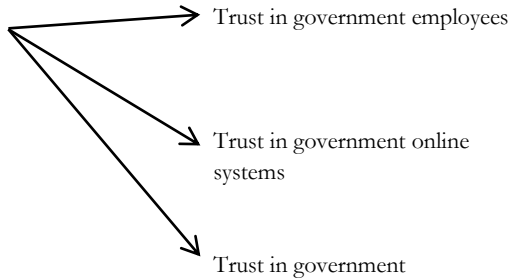
INFLUENCE:

Motivations



- I need the service
- I will be informed all the time about the progress of my application
- It is cheaper online
- Online saves time and money
- I don't have to travel and look for parking
- It is faster online
- It is easier online

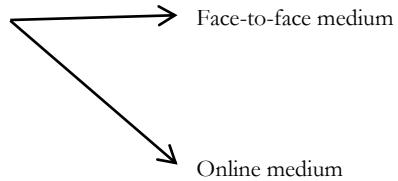
Trust in e-government



- Attitude towards government employees
- Competence of government employees
- Third party agencies working on behalf of government
- Online services' information quality
- Who to hold responsible if something goes wrong
- Technology used
- Processes and procedures
- Perception of government transparency and integrity

LEAD TO:

Government Communication Preference



- Like to talk to a human not a machine
- If I need to make a case
- If I need to ask questions or seek clarification
- I need a proof /confirmation
- Have no choice but to do it online
- Online is convenient

Figure 4-2: Taxonomic Analysis of e-government Adoption

A number of relationships between the six different domains discussed in section 4.4.2.2 and section 4.4.2.3 were identified, and are illustrated diagrammatically in Figure 4-2. The following section provides statements extracted from the interview transcripts that represent the relationships between the six domains.

Interviewees' concerns about Perceived Online Safety affects their Motivations to communicate with government online. Many interviewees, because of the concerns they have about the security and privacy of their personal information, are less motivated to use online services and are more inclined to communicate with government face-to-face regardless of the benefits of using online services. Such sentiment among interviewees is summarized by the following participants' comments:

“You know wherever you go in (country name) it will be very busy so if you do it online you will save yourself a lot of trouble but again I don't think they have been using a lot of online government services for a long time, I don't know how efficient they are I would be very worried about the safety of whatever information I am giving so probably I will not risk it. I will go in person regardless of the fact that it might be busy” (Diana)

“Well with what is going on around the world right now I would rather do it face-to-face ... you never know who is there on the other end you see what happened with WikiLeaks. That's exactly the fear I am talking about; people tell you that all these things are safe but they are not really as safe as they claim! When something goes wrong people become surprise! How WikiLeaks got all the information they have published? this is exactly the thing for me if I have my way I will do my things offline to be honest” (Jamal)

Individuals who are motivated by the convenience of online services or by the benefits they could obtain by using the services naturally stated that they would like to communicate with government using online services.

“I don't want to go around and go to the places, find parking and stay on the line, I prefer online.” (Naomi)

“If it is face to face you need to wait, you need to take an appointment may be that the papers they want you did not bring! Then I have to go back and try again so I prefer online because I can fill [in] the details, I can bring the document they want and I can see how much it will cost. (Raja)

However, those who lacked such Motivation, because of the Perceived Online Safety concerns discussed earlier, or they have Trust issues in online systems because of concerns about the confidentiality and security of their personal information online, expressed the view that they prefer to communicate with government face-to-face rather than online. The relationship between the Perceived Online Safety and Trust domains, and how this relationship shapes end-users’ perceptions of e-government systems, is illustrated by the following participants’ comments:

“If they were asking for too much personal information, too many details not just the basic things I would feel very suspicious about it, I would prefer to talk to someone about and ask them why would you need to know this information!”
(Brendon)

“Personally I think if you meet them face to face it is better. I feel that their electronic services are not good, the information is not up to date.” (Arwa)

“If something involves giving them a large amount of money I would prefer to do it face to face. The higher the risk the more I want to do it one on one.”
(Diana)

“I don’t trust them [online systems] because when there is a problem you’ve nowhere to go” (Jamal)

“I would prefer to go face to face and do it there. [Because] I have heard about lots of crimes online people can take your photos they can take your personal information I’ve heard that.” (Mai)

It was noticeable that participants’ Online Experiences (previous online experiences, attitude towards computing and online services awareness) influences Motivations. Individuals who have more experience using online systems for different tasks (work related, e-commerce, social website ...etc.) as well have some experience in electronic commerce are generally more motivated to communicate with government using online services. The relationship between Online Experiences and Motivation

domains is illustrated by the following participants who were all frequent users of computers.

“He prefers to do everything online if possible, he doesn’t have the fear things might happen or things might go wrong. Most of my friends they use online services to do things they tend to do online shopping often.” (Diana)

“I think the online services here still in its early days it will be better and better in the future.” ... “It makes thing easier, you save time now a days everything must be done quickly.” (Amena)

In addition, the individuals Online Experiences influences Trust as illustrated by the following comments:

“I don’t have worries when using online services because I didn’t have a bad experience yet.”(Kat)

“I don’t have an issue with security [website security], because before I go to the website I check that it has encryption and it’s a secure website that uses certificates. So I’m not too concerned about revealing my credit card details online because I trust these companies.” (Brendon)

“Let us say I want to do a bank transaction, back in the US I would feel secure in doing so why? Because I know they have standardized way in getting things done there.” (Ali)

Finally, participants’ Socials Context played an important role in motivating them to use online services by raising their awareness as well as persuading them to use the services, thus influencing their intentions to use online government services. The relationship between these domains is illustrated by the following participants’ comments:

“I am looking for a job nowadays, I asked my friends and they told me go to Abu Dhabi government portal” (Mai)

“Because of someone I know that deal with them I thought to try them” ... “because I know the girl who introduced me to them I feel confident to try.”(Arwa)

In addition, participants’ significant others play an important role in establishing their Trust in online services. The relationship between the two domains is highlighted by

Raja's comments who mentioned that his social surroundings play an important role in building his trust in online services and ultimately affecting his decision to use the services.

“Well, before I use a credit card online I will ask people for information and if they say it's okay then I can use the credit card. Without information [from friends and family] I am not going to use the website. This is my personal opinion... yah I don't want to risk it” (Raja)

The following are descriptions of the domain-relationship model presented in Figure 4-3:

- R1: *Individuals who perceive online government services to be safe are more likely to be motivated to use the services.*
- R2: *Individuals who perceive online government services to be safe are more likely to trust these services.*
- R3: *The social surroundings of an individual (friends and family) play a major role in motivating individuals to use online services by sharing information about those services, their usefulness and convenience.*
- R4: *Individuals' trust in government systems is largely affected by their social surroundings (friends and family).*
- R5: *Individuals who find online government services easily accessible are more likely to be motivated to use those services.*
- R6: *Individuals who have good computing experiences and awareness of online services, and have positive attitudes towards computing in general, are more likely to trust online government services. On the other hand, individuals who have had bad computing experiences and awareness of online services, and have negative attitudes towards computing in general, are less likely to trust online government services.*
- R7: *Individuals who are motivated by the practical advantages of online government services (e.g. convenience and cost effectiveness), are more likely to intend to interact with government using online government services.*
- R8: *Individuals who trust online government services are more likely to intend to interact with government using online government services.*

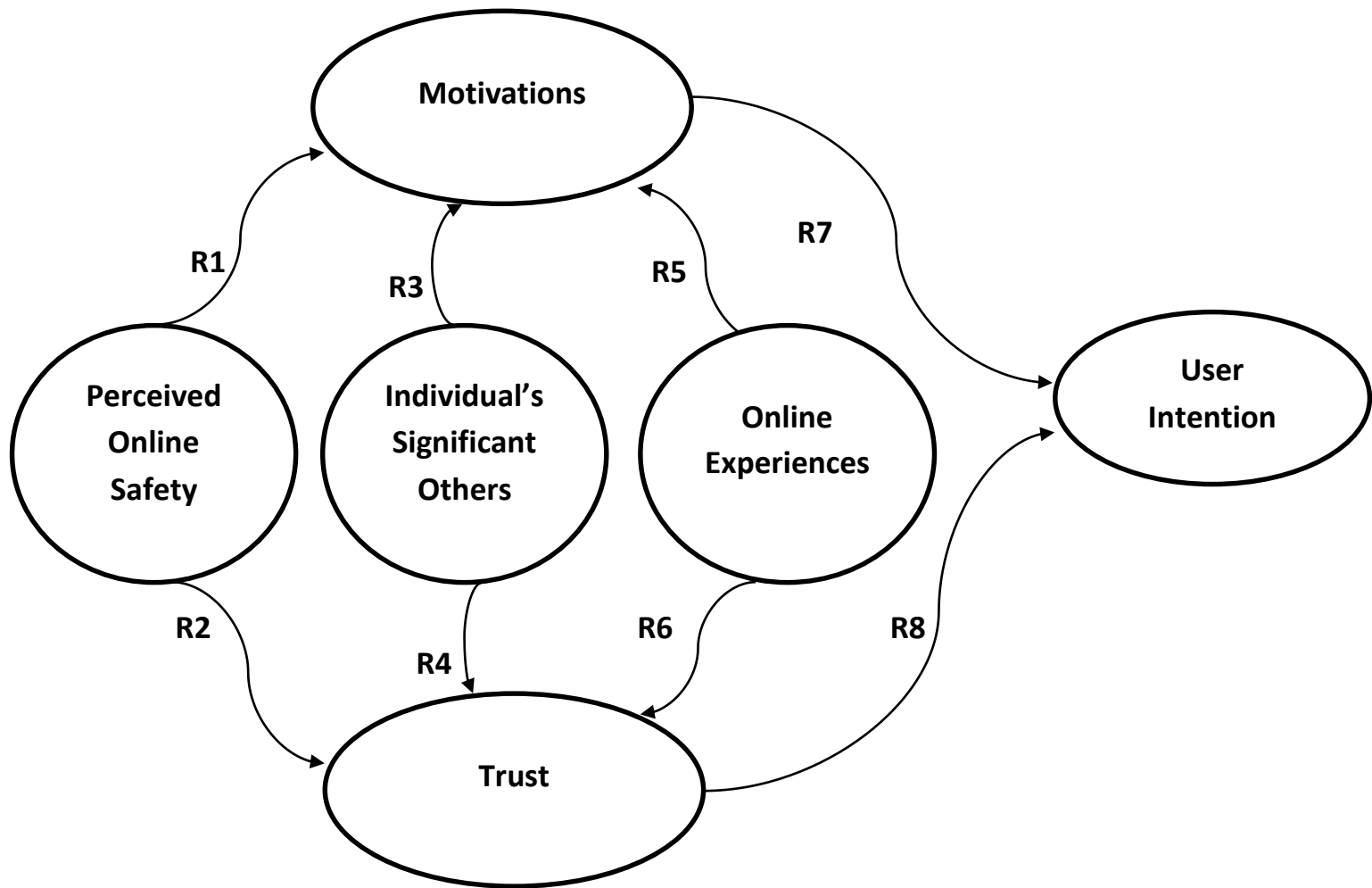


Figure 4-3: Domain-Relationships Model

As mentioned in section 3.5.1, this study adopted the exploratory sequential mixed-methods research design suggested by Creswell (2012), and following the exploratory design implementation procedures described Figure 3-4 in Section 3.5.1, the relationship model presented in this section provides a basis for formulating the study hypotheses which are stated in Section 5.3.2 of the next chapter.

4.5 Summary

This chapter provided a description of the interviewees, the interviewing process and the data analysis technique used in the study. It also reports the findings from the qualitative phase of the study.

To ensure that the qualitative phase followed a rigorous approach, the researcher applied the four quality assurance criteria: credibility, transferability, dependability and confirmability suggested by Lincoln and Guba (1984). Additionally, Shenton's (2004) suggested strategies also informed the current study.

The transcribed interview data were analyzed using domain analysis techniques. The analysis process began with an identification of the primary domains which recurred in the interviewees' discourse. Subsequently, the actual phrases from the interviewees were arranged into the primary domain which allowed the identification of the sub-categories to emerge directly from the interviewees' own words and thus represented the topics that were most important to the participants. The third step in the analysis process involved representing what interviewees actually said about the different sub-categories identified during the previous stage of the process by using quotations from the interview transcripts. The final step in the process was to identify relationships between the different domains by establishing associations and influences among the domains.

This chapter presented six domains that summarize the factors influencing the participants' adoption of e-government. The diverse views and attitudes expressed by the study participants, regarding each domain, indicated that the testing of these

domains using quantitative data analysis techniques using Structural Equation Modelling (SEM) would be feasible. The chapter concluded by proposing a domain-relationship model that summarizes the various domains that emerged as a result of using the qualitative research approach described in this chapter, as well as the relationships between the domains.

The domains obtained from this phase of the research together with their relationships are used in the next chapter, in conjunction with theoretical concepts identified in the literature review, to construct a theoretical model that describes the factors influencing the adoption of online government services in Abu Dhabi. The theoretical model is then validated using survey data and quantitative data analysis techniques (SEM). Details of this process are given in the following chapter.

5 CHAPTER FIVE: QUANTITATIVE PHASE

5.1 Introduction

As mentioned in section 3.5, this study employs the mixed-methods research approach described by Creswell (2012). Using this method, the researcher conducted a qualitative study to better understand the factors that influence end-users' acceptance of e-government in Abu Dhabi using semi-structured interviews and the domain analysis techniques. This was followed by the second component of the mixed-methods approach (the quantitative study) which was conducted to develop the theoretical framework for this study and formulate the study hypotheses using the qualitative phase results, and empirically test and validate the theoretical framework proposed in this study.

This chapter starts by explaining the quantitative process followed in this phase of the project, which is hypothetico-deductive in nature. Then, the theoretical research model is presented where the details of the various proposed study constructs, the study's hypotheses, and the controls used are presented. This is followed by a description of the way in which the instrument used for data collection was developed and validated. Also, the sample used for the data collection is described.

The chapter then provides details about the various statistical tests and procedures applied in order to screen the dataset to ensure that valid and reliable data is used in the subsequent SEM analysis. After screening the dataset, the data analysis procedures conducted to test the hypotheses proposed in this chapter using survey data and quantitative data analysis techniques are presented.

The chapter concludes by presenting the SEM model used to examine the relationships between the study constructs as well as presenting the outcome of the hypotheses testing results revealing whether or not the hypotheses proposed in this study were supported.

5.2 The Hypothetico-Deductive Process

Chapter Two of this study presented a number of models that have been frequently used to explain individuals' attitudes and behaviour regarding the adoption of new technologies. The previous chapter concluded by presenting the six domains that emerged from the qualitative phase of this study (see Section 4.4.2.4). These domains provided insights into the factors that influence e-government adoption in Abu Dhabi and provide a base for developing theoretical framework used in this stage of the project. Sekaran and Bougie (2010) state that after researchers have conducted qualitative interviews, completed literature reviews and defined the research problem, they are ready to develop a theoretical framework for their studies. They also state that a theoretical framework is the foundation of hypothetico-deductive process as it is the basis for building testable hypotheses to determine whether or not the proposed theory is valid.

The hypothetico-deductive process has a number of steps, beginning with the generation of theories and hypotheses. These theories and assumptions could be based on a number of elements such as personal experiences, interviews, observations, or on theories and hypotheses that stem from a literature review. In addition, a desire to solve an existing problem could motivate researchers to establish new theories and assumptions. The second step in this process is the operationalisation of the theory concepts or hypotheses in such a way that they can be tested or measured using quantitative methods. The third step in the process seeks to identify and decide on which quantitative research approaches to use to measure the operationalized concepts. This task is achieved by using a validated, reliable and suitable quantitative data collection instrument, sampling plan, data collection methods, and methods of analysis and interpretation of empirical results. The fourth and final step in the hypothetico-deductive process is the falsification and discarding step. In this step, researchers decide whether to accept or reject each of the tested hypotheses using deductive reasoning techniques (Lancaster, 2005).

The hypothetico-deductive processes is employed in this phase of the study to formulate and empirically test a theoretical model that presents the factors that influence the adoption of e-government by end-users in Abu Dhabi. The six domains (concepts) identified at the end of the chapter describing the qualitative phase, along with established technology adoption established (such as TAM, DOI and UTAUT) and the wider technology adoption literature discussed in Chapter Two, informed the proposed model which comprises a number of testable hypotheses. This model is described in the following section.

5.3 The Theoretical Research Model

Glanz, Rimer and Viswanath (2008) state that the major components of theories and conceptual models are referred to as ‘concepts’. When concepts have been developed, created or adopted for use in a particular theoretical context, they are referred to as ‘constructs’ (Kerlinger, 1986). According to Gay and Weaver (2011), theories are “systematic sets of interrelated statements and constructs intended to explain some aspect of social life” (p. 26). This view is shared by Rychlak (1968) and Kerlinger (1986). The latter states that theories are: “set of interrelated constructs, definitions, and propositions that presents a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting phenomenon” (p.9).

Hypotheses are one of the keystones of any theoretical framework. Sekaran et al. (2012) define a hypothesis as “a tentative, yet testable, statement, which predicts what you expect to find in your empirical data” (p. 87). They further state that these testable statements should be defined as logically conjectured relationships between two or more variables.

The third component of a theoretical framework is the controls. Creswell (2012) states that controls are a “type of independent variables that researchers measure for the purposes of eliminating it as a possibility, but it is not a central variable of concern in explaining the dependent variables or outcomes.” (p. 117). In addition, Tuckman

(1999) states that researchers need to account for control variables and “neutralize” (p. 100) their potential effects on the dependent variables in any given theoretical framework. Typically, these variables are personal demographic attributes such as gender, socioeconomic status or race (Tuckman, 1999).

The next section describes the Demand-based e-government Adoption Model (DeAM), the theoretical framework presented in Figure 5.1. The following three subsections describe the research constructs, hypotheses and controls presented in DeAM.

5.3.1 The Study Constructs

Hair et al. (2010) define a construct as a concept that the researcher is interested in and that can be defined in conceptual terms. In addition, Kaplan (1964) explains that a construct has at least two meanings: systematic and observational meaning. The systematic meaning ensures that there is a theoretical context that explains the construct; while the observational meaning ensures the constructs can be operationalized and can be either directly or indirectly measured. The omission of either of these dimensions makes a construct either a metaphysical term or just an observational term (Peter, 1981).

For a construct to be valid, both the systematic and observational meanings must be established. This section establishes the systematic meanings of the study constructs by explaining the theoretical base for each construct. Section 5.7 explains how the observational meanings of the study constructs were established.

According to Glanz et al. (2008) and Mackenzie McKenzie, Neiger, & Thackeray (2012) the empirical counterpart or operational (practical use) form of constructs are referred to as variables. Glanz et al. (2008) states that variables “specify how a construct is to be measured in a specific situation” (p. 28). This section applies the second step in the hypothetico-deductive process by defining each of the constructs

presented in Figure 5-1 and explaining the measurement scale used to empirically test each construct.

5.3.1.1 Perceived Online Safety

In the previous chapter, Section 4.4.2.2.1 described the Perceived Online Safety domain as one of the six concepts that emerged from the qualitative interviews. The *Perceived Online Safety* construct refers to the degree to which an individual perceives that his/her personal data is looked after or “protected” when s/he uses an online government system. This concept has been adopted for use within the theoretical framework of the quantitative stage of this study for two main reasons. First, the comments relating to the security and privacy of an individual’s personal information when using online systems were among the most discussed topics during the interviews.

Second, the e-government adoption literature reviewed in Chapter Two of this study also supported the decision to include this construct in the theoretical model. In the literature reviewed, a number of e-government adoption studies have identified the principle components of this construct (perceived privacy and perceived security) as one of the factors affecting the uptake of online government services. For examples, Al-Adawi et al., (2005) applied TAM to develop a conceptual model of citizen adoption of e-government. One of the constructs identified in their model is perceived risk. Kumar et al. (2007) identified perceived security, perceived privacy and perceived uncertainty as principle components of a perceived risk construct in their model. Finally, Kunstelj et al. (2007) identified security and privacy concerns as additional important barriers to e-services use.

As both the qualitative stage and prior literature supported the perceived online safety construct, the researcher decided to include this construct in the model for empirical testing

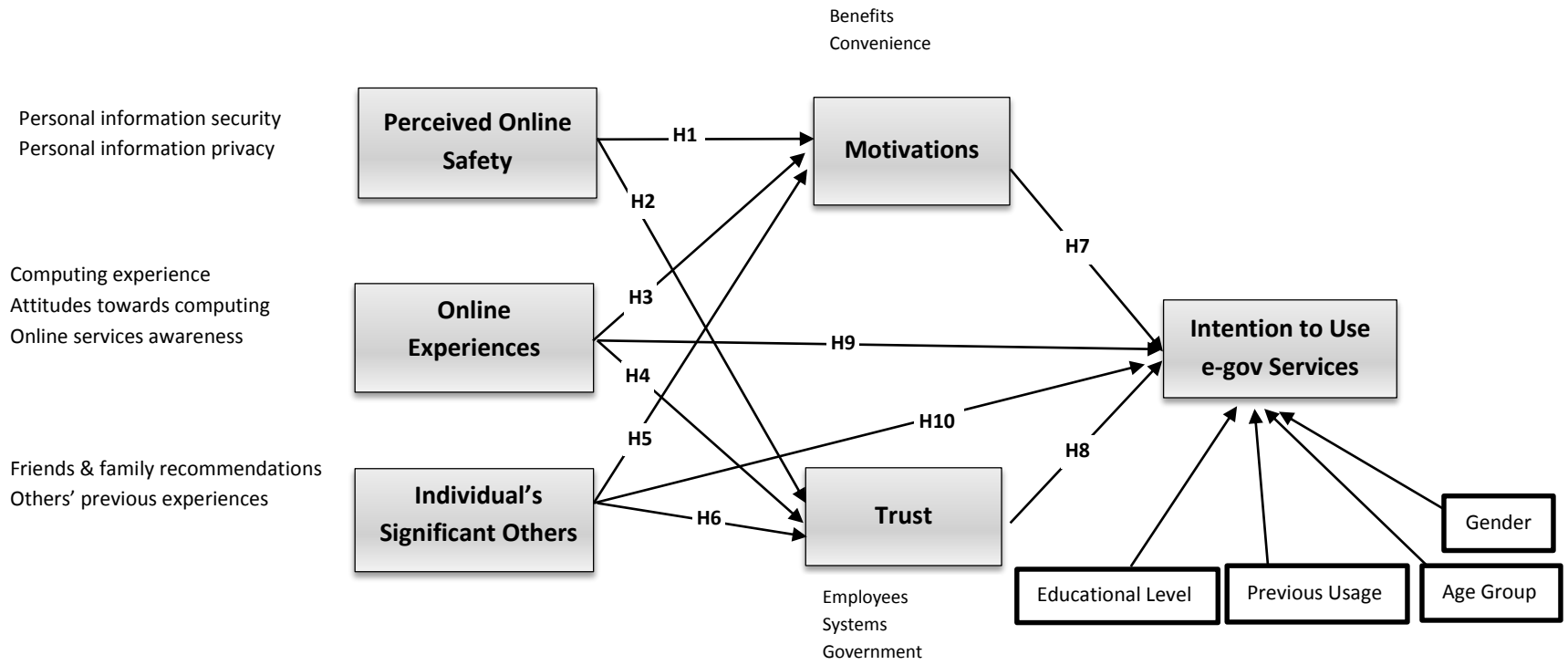


Figure 5-1: Research Theoretical Framework

5.3.1.2 Online Experiences

The second construct is *Online Experiences*. Similar to the first construct, the Online Experiences domain identified in the qualitative phase of this project provided the seed concept used in developing this construct. As described in the previous chapter (Section 4.4.2.2.2), the analysis of the qualitative data collected indicates that the Online Experiences domain has three sub-domains. The first sub-domain refers to individuals' computing experience (accessibility, skill level, confidence, the frequency of using computers to perform routine task such as communication, banking, shopping ...etc.). The second sub-domain refers to individuals' attitudes towards computing in general (for example the fear of making mistakes when using computers, their about the usefulness of technology in general). The third sub-domains refers to individuals' awareness of the existence of online government services (i.e. do they know about the existence of an online services, have they seen information promoting these services). The *Online Experiences* construct is intended to measures individuals' perceived awareness of government online systems; his/her computer-self efficacy and the availability of resources that s/he needs to be able to access online services.

The inclusion of this construct is also informed by the existing technology adoption literature. In addition to the evidences collected from the qualitative phase of the project, the researcher reviewed a number of studies that investigated the principle components of this construct looking for further evidences from the literature that support the inclusion of this construct in the study's theoretical framework. Charbaji and Mikdashi (2003) found that public awareness of e-government services leads to increased participation. In addition, a number of studies identified public awareness of e-government as a critical online services adoption factor (Kunstelj et al. (2007), Lassnig & Markus (2003), and Ahmad, Jouni, & Markku (2012)). However, some scholars suggest that public awareness is not a significant factor; for example, see Mofleh and Wanous (2008). A number of studies investigated the individuals' attitudes/perception towards computing and prior experiences also supported the

qualitative phase findings (for examples of these studies see Davis et al. (1989), Fisher and Howell (2004) and Kumar et al., (2007).

Given that a significant number of the reviewed technology adoption studies seem to be consistent with the qualitative phase conclusion of this project where both suggest that *Online Experiences* is an e-government adoption factor, the researcher decided to include this construct in the framework for further testing and validation.

5.3.1.3 Individual's Significant Others

The fourth construct is Individual's Significant Others (ISO). This construct is intended to measure the degree to which an individual's significant others (such as friends, family acquaintance ...etc.) reassure an individual that the position he/she has taken on the value of using online government systems is not risky. As described in Chapter Four, Section 4.4.2.2.3, in a large number of interviews participants mentioned that they rely on their significant others for advice and reassurance about their online behaviour. The ISO domain reflected the role that this construct plays in persuading an individual to use e-government systems or otherwise. It was quite clear from the results obtained during the qualitative phase of this study that friends, family and acquaintances ...etc. play a role in the interview participants' decisions to use on online government systems, and therefore the researcher included this construct in the framework.

This is reminiscent of, but not the same as, the Social Influence construct in UTAUT. While ISO is about seeking reassurance that using the system is not risky, Social Influence is more about compliance. The UTAUT suggests that Social Influence is "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al. 2003, p. 5410, emphasis added). This definition emphasises compliance with the expectations of others in the decision-maker's social context; i.e. the construct suggests that the individual is expected to comply with what others want him/her to do. This notion is highlighted in the three

root constructs proposed in the UTAUT (Subjective Norms, Social Factors and Image) and the scale items used to measure the Social Influence construct. The definitions of the root constructs and the scale items used to measure the constructs imply that the individuals are “expected” to: first, comply with the social norms of an organization, which is reflected in using scale items such as “People who are important to me think that I should use the system”. Second, individuals are expected to comply with the subjective culture of their organization. This is reflected in the definition of the Social Factors root construct and in the scale items used to measure this construct (for example “My supervisor is very supportive of the use of the system for my job” or “The senior management of this business has been helpful in the use of the system.”). Third, individuals are expected to maintain a desirable image within their place of work by using the system; this is reflected in scale items such as “People in my organization who use the system have a high profile.” or “Having the system is a status symbol in my organization”.

5.3.1.4 Motivation

The third construct is *Motivation*. This construct is defined as the degree to which individuals perceive that the use of online government systems will be beneficial to them. The decision to include this construct in the project’s theoretical framework was informed by first, the qualitative phase of the project, and second by the technology adoption theoretical model and existing e-government and technology adoption literature. As described in detail in Chapter Four, Section 4.4.2.2.4, this concept attracted a large number of interviewee comments about the importance of this concept to them. These comments related to both tangible and intangible benefits expected by individuals when evaluating the use of online line services.

The technology adoption theoretical models and previous technology/e-government adoption literature have also informed the decision to include this construct in the theoretical framework of this study. For example, the UTAUT presented Performance Expectancy and Efforts Expectancy as factors motivating users to adoption a new

technology. TAM cited Perceived Ease of Use as a key adoption factor and DOI presented Relative Advantage as a technology adoption factor as well. In addition, a number of scholars used these theoretical models to guide their own studies in which they included motivation as a factor. Perceived benefits such as saving time and money have been cited by a number of authors as a technology adoption factor; examples are given in Carter and Bélanger (2005), Collier and Bienstock (2006), Shareef et al. (2007) and Al Awadhi (2008). Convenience has also been cited as a motivating factor by a number of scholars; for examples, see Sahu & Gupta (2007), and Hu et al. (2009) and Ratten (2015).

Given that a number of the study interviewees mentioned that one of the factors that motivates them to use online government services is related to its convenience and to saving time and money, and a number of studies included motivation as a technology adoption factor, this has been included in the framework.

5.3.1.5 Trust

Trust is the fifth construct in the theoretical framework. This construct refers to the degree to which an individual perceives that online systems are trustworthy. Similar to the previous constructs, the researcher found evidence that supports the inclusion of this construct in the study framework in both the qualitative phase of the study (see section 4.4.2.2.5) and in the wider technology adoption literature. The trust concept, including its three components (trust in government employees, government systems and in government itself), has featured in almost all the interviews conducted during the qualitative phase.

While this construct has not been listed as a construct in any of the major technology adoption theoretical frameworks reviewed (including UTAUT and DOI), a number of e-government-related studies suggested trust as an e-government adoption factor. For example, Gilbert, Balestrini and Littleboy (2004), Rehman et al. (2012) and Shareef et al. (2011) included trust as one of the factors influencing e-government adoption.

Hence, based on the qualitative phase results and the e-government adoption literature reviews, this construct has been added to the study framework.

5.3.1.6 Intention to Use e-government Services

While all of the constructs listed above represent the independent variables in the proposed theoretical model, the last construct, *Intention to Use*, measures an individual's intention to use online government services in the near future, and is a dependent variable. As described in section 4.4.2.2.6, the qualitative phase participants indicated their intention to use online government services (or not) by expressing their preference to deal with government using either computer-mediated communication or the conventional face-to-face approach.

5.3.2 Research Hypotheses

The research framework presented in *Figure 5-1* includes ten hypotheses that predict the relationships between the five dependent variables (*Perceived Online Safety*, *Online Experiences*, *Individual's Significant Others*, *Motivation*, and *Trust* and the independent variable (*Intention to Use e-government Services*). This section provides the rationale for each hypothesis. As discussed in Section 3.5.1, these hypotheses were informed by the results from the qualitative phase and also by relevant literature.

5.3.2.1 H1: Perceived Online Safety has a positive effect on Motivation.

The qualitative interviews revealed that participants who are anxious about disclosing sensitive personal details online (such as credit card numbers, passport numbers ...etc.) are less motivated to use online systems despite the obvious advantages (such as convenience, saving time and money ...etc.) offered by these systems. A number of participants stated that they prefer the inconvenience of visiting a government office in person than take the risk of compromising the security and privacy of their information by using online government systems.

The concerns raised by the participants are consistent with those of a number of e-commerce studies that suggest that privacy and security concerns have a negative impact on motivation. Miyazaki and Fernandez (2001) state that consumers perceive buying in online stores as more risky than buying in person from conventional stores. Furthermore, Topaloğlu (2012) argue that perceived security has a significant impact on users' motivation to shop online in Turkey. In addition, Suki, Ahmad, and Thyagarajan (2001) found that privacy is the most significant concern that users have when they shop online.

Thus, we propose that Perceived Online Safety has a positive and direct effect on Motivation.

5.3.2.2 H2: Perceived Online Safety has a positive effect on Trust.

During the qualitative phase of this study, a number of interview participants indicated that their concerns about the privacy and security of their personal data are influencing their level of trust in online systems. The comments made by the interviewees along with the literature reviewed formed the basis for this assumption.

The author argues that trustworthy people are not necessarily technically competent – hence, a high trust in government employees would not necessarily translate to a high perception of the safety of data held in government systems. For example, although the author has a high level of trust in the New Zealand government, this has no effect one way or another on the author's perception of the online safety of online government systems in New Zealand. Actually, an individual's Perceived Online Safety has a direct impact on his/her level of trust in government online systems. Shareef et al. (2011) assert that perceived privacy and perceived security are positively related to trust in e-government.

This hypothesis is also inspired by the literature on “website-trust” in the e-commerce context. Previous research in this area has shown that people who are naturally concerned about the privacy and security of their personal data generally tend to

distrust online systems (Yousafzai, Pallister and Foxall; 2009, Kerkhof et al., 2010). Further, Rifon et al. (2005) found that adding privacy policies and privacy seals enhanced users' trust in the website they were visiting. In addition, Jensen, Potts, and Jensen (2005) found that displaying content-free symbols (such as credit card company logos and website security vendors logo) in a website have increased participants' willingness to trust certain sites.

Furthermore, people do not necessarily know government employees first-hand and have relatively little day-to-day experience of government. Hence, government is relatively unobservable for most people. However, people do form impressions of government through those interactions they do have, including online government services. If people's perceptions of online government systems are negative, they will, consequently, tend to form a negative view of government. Thus, low perceived online safety is hypothesised to contribute to low trust in government generally, and high-perceived online safety is hypothesised to contribute to high trust in government.

Thus, we propose that Perceived Online Safety has a direct positive effect on Trust.

5.3.2.3 H3: ISO has direct effect on Motivation.

The results of the qualitative phase highlighted the relationship between the Individual's Significant Others and the Motivation constructs. Many participants stated that their friends and family play an important role in raising their motivation level. Friends and family talk about the benefits they gain by using online services, which in turn increases the individual's level of interest in online services.

Mikelaf et al. (2013) have recognized the impact of an individual's social connections in the form of word-of-mouth recommendation from friends, family and peers. They assert that product marketers are increasingly paying attention to word of mouth, since positive feedback from a peer about a product is a strong motivator for future purchasing.

Thus, we propose that Individual's Significant Others have a direct effect on Motivation.

5.3.2.4 H4: ISO has a direct effect on Trust.

In addition, a number of studies strongly associated social influence with individuals' willingness to provide personal information online (Bhattacharjee, 2000; Hwang, 2005; Limayem et al., 2000). This suggests that individuals' level of trust in online services is a function of their social network.

During the qualitative phase of this study, a number of the interview participants indicated that their social surroundings (friends and family) influence their trust in online services, ultimately affecting their decision to use these services. As mentioned in section 4.4.2.2.3, friends and family members are one of the main sources of information about the services that are available online, thereby contributing to individual awareness of online services. Several participants stated that their significant others have helped them establish trust in online services. The fact that most of the interviewees always looked for their 'significant' others' endorsement before trying new online services indicates the effect that Individual's Significant Others has on Trust.

Thus, we propose that Individual's Significant Others has a direct positive effect on Trust.

5.3.2.5 H5: Online Experiences has a positive effect on Motivations.

During the qualitative phase of this study, the researcher noticed that most of the interview participants who expressed positive attitudes towards computing were more motivated to use online government systems. However, those who were less enthusiastic about technology in general lacked the computing skills required to access online services, or were not aware of the existence of these services and were less excited about online government systems.

Bandura (1977), Stumpf, Brief and Hartman (1987) found that individuals experience anxiety when attempting to perform tasks they do not feel competent to perform. In addition, Bandura (1986) suggests that perceived self-efficacy (strongly affected by an individual's computing experience) plays an important role in affecting individuals' motivation to use a system. He suggests that individuals who consider computers too complex, or feel anxious about using computers because of the fear of making mistakes, will prefer to avoid them and are less likely to use them. Further, it has also been suggested that self-efficacy influences individuals' motivation to use online services (Gist, 1989; Kim and Kim, 2005).

After evaluating the results of the qualitative phase of this project and the user acceptance of technology literature, we propose that Online Experiences has a positive and direct effect on Motivation.

5.3.2.6 H6: Online Experiences has a direct positive effect on Trust.

The proposition of this hypothesis was informed by the qualitative phase results, which indicated that Online Experiences has a positive direct relationship on Trust. It was noticed that individuals with high computing self-efficacy, positive attitude towards computing, and aware of the various online government services on offer are likely to have a high level of Trust. However, the level of trust diminishes when individuals encounter negative experiences online as illustrated by one of the interview participants in section 4.4.2.4. It was also noticed that individuals who hold negative views about computing/online systems or are uncertain about what e-government services offer, tend to trust these services less.

In addition to the insights obtained from the interview data, the e-commerce literature provided several guidelines for the formulation of this hypothesis. For instance, Kim and Kim (2005) assert that self-efficacy has an impact on trust building and uncertainty reduction between customers and online merchants when they investigated the factors that influence trust during online transactions. In addition, a number of authors

suggested that end-users' prior experiences with e-commerce affect their level of trust in online transactions (Gefen, 2002; Corbitt, Thanasankit and Yi, 2003).

Hence, we propose that Online Experiences have a direct and positive effect on Trust.

5.3.2.7 H7: Motivation has a direct and positive effect on Intention to Use e-government Services.

The qualitative phase of this study revealed that participants who are motivated to use online government services are driven by the potential benefits that online services have to offer. The participants cited convenience, their need for a particular online service, saving time, and being in control as possible reasons that explain their positive attitudes towards online services (see section 4.4.2.2.4).

Along with the qualitative phase results, the formulation of this hypothesis was also informed by the DOI theoretical framework and e-government literature. DOI has perceived that the relative advantages of an innovation are one of the factors that determine a potential adopter's perception of an innovation (Rogers, 1995). In addition, Griffin et al. (2011) found that potential time saving, cost savings and avoidance of interaction as relative benefits that determine citizens' attitudes towards the use of the Web as a platform for the delivery of public services in the UK context.

Thus, we propose that Motivation has a direct and positive effect on Intention to Use e-government Services.

5.3.2.8 H8: Trust has a direct and positive effect on User Intention to Use e-government services.

The Trust domain described in Section 4.4.2.2.5 summarized the views of the qualitative phase participants. It was noticed that participants who trust government, its systems and employees, showed willingness to use online government systems. However, those who were somewhat suspicious were not as enthusiastic, and in some cases, reluctant to try e-government systems.

Similar sentiments were found in e-commerce literature that investigated the effect of trust on users' intention to engage in e-commerce. Gefen et al. (2003) found that trust is as important as TAM's use-antecedents, perceived usefulness and perceived ease of use, which are factors used to predict online shoppers' intention to use e-vendors. They assert that the presence of trust increases the consumer's belief in the integrity of online merchants, thereby influencing their purchase intentions. Reichheld and Schefter (2000) also disclosed that consumers who lack trust in a specific online merchant are not likely to take part in e-commerce. Further, Corbitt et al. (2003) suggest that people are more likely to make online purchases if their perception of trust in e-commerce is high and they are experienced Internet users.

Thus, we propose that Trust has a direct effect on Intention to Use e-government Services.

5.3.2.9 H9: OEX has a direct and positive effect on Intention to Use e-gov Services.

Literature suggested that an additional two hypotheses that had not emerged during the domain analysis were plausible and deserved to be tested. These hypotheses are presented in this and the following section.

A number of technology acceptance theories such as TRA (Fishbein and Ajzen, 1975) and TAM (Davis, 1989) showed that an individual's attitude towards performing a behaviour affects his/her intention to perform the behaviour under consideration. While some authors discounted the role of attitudes in explaining an individual's acceptance of technology (Davis, Bagozzi, and Warshaw, 1989), many argue that attitude towards technology plays a significant role in explaining the use behaviour of individuals (Krosnick and Petty, 1995; Petty, Haugtvedt, and Smith, 1995).

Therefore, we propose that Online Experiences have a direct and positive effect on Intention to Use e-government Services.

5.3.2.10H10: ISO has direct effect on Intention to Use e-gov Services.

Behavioural sciences researchers suggest that people look at the behaviour of others in order to determine their own. Robert Cialdini states, “When people are uncertain about a course of action, they tend to look to those around them to guide their decisions and actions. They especially want to know what everyone else is doing – especially their peers”.

An individual’s social context has been proposed as a construct affecting users’ intention to accept an innovation by a number of technology adoption theories such as DOI (Rogers, 1995); TAM2 (Venkatesh and Davis, 2000) and the UTAUT (Venkatesh et al., 2003). Venkatesh et al. argue that the degree to which an individual perceives that important others believe he or she should use the new system significantly affects his or her intention to use the new system. In addition, Igbaria et al. (1996) found that social pressure affects an individual’s decision to use a microcomputer.

When applying the same concept to the e-government context, it is reasonable to expect that an individual’s social context influences his/her intention to use e-government. Tung and Rieck (2005) found that perceived benefits, external pressure and social influence positively affect the firm’s decision to adopt e-government services in Singapore. Furthermore, Al Awadhi and Morris (2008) investigated the factors influencing e-government adoption from individuals’ perspectives. They found that social influence determines individuals’ intention to use e-government systems in Kuwait. Hence, this study investigates the factors that influence e-government adoption in the Middle East context. Therefore, we propose that an Individual’s Significant Others have a direct positive effect on Intention to Use e-government Services.

5.3.3 Controls

The framework presented in section 5.3 includes four control variables (extraneous variables): Age Group, Gender, Education Level and Previous Experience.

While the gender gap when it comes to attitudes towards computing is almost diminishing, some authors argue that such a gap is still there. Farman Afzal et al. (2013) contrasted male and female attitudes towards computing. They stated that males tend to display a more positive attitude towards computers, regardless of their level of expertise, while female attitudes become more positive as the level of expertise increases. A number of female participants during the interviews indicated that they rely on their male family members to engage with government on their behalf. Given that this study takes place in the Middle East context, we argue that there is a need to control this variable.

It is expected that attitude towards computing in general, and the acceptance of e-government services in particular will be influenced by an individual's age. In addition, the technology adoption literature suggests that older adults are less likely to accept e-government services compared with their younger counterparts; hence the need to control this variable.

Further, Rogers (2003) states that Innovators are usually younger and educated, and have the resources and means to access innovations. In addition, Agarwal and Prasad (1999) indicate that educational levels are positively associated with PEOU. In order to neutralize the effect of education level on the DV, the researcher decided to control for this construct as the empirical data is collected from a range of participants with different levels of education and different previous experiences with e-government usage.

5.4 Instrument Development

Chapter Three, Section 3.5.3.3 provides a detailed discussion about the various instrument validity measures adopted for this study. This chapter continues this

discussion by providing more details about how the researcher developed the survey instrument to measure the constructs identified during the quantitative phase of this project. In addition, Section 5.7 in this chapter provides more details about the statistical tests performed to establish the instrument validity and reliability. As mentioned in Section 3.5.3.2, this study uses a 11-point Likert scale to empirically measure each of the constructs defined in this section. Table 5-1 describes the scale range for each variable.

Table 5-1: Study constructs, variables and scale ranges

Construct	Variable	Measurement Scale
Perceived Online Safety	POS	A score of 10 indicates that an individual feels his/her personal information is safe when using online systems while 0 indicates that an individual feels that his/her personal information is unsafe when using online systems.
Online Experiences	OEX	A score of 10 indicates that an individual has no issues accessing online services, while 0 indicates that an individual finds accessing online services very challenging.
Individual's Significant Others	ISO	A score of 10 indicates that an individual is highly affected by his/her significant others, while 0 indicates an individual is not affected by his/her significant others.
Motivation	MOV	A score of 10 indicates that an individual is highly motivated to use online systems, while 0 indicates an individual is highly demotivated to use online systems.
Trust	TRU	A score of 10 indicates that an individual perceives that online government systems can be totally trusted, while 0 indicates an individual perceives that online government systems cannot be trusted.
Intention to Use Government Services	ITU	A score of 10 indicates that an individual has strong intention to use the services in the near future, while a score of 0 indicates that s/he has no intention of using the services in the near future.

It is imperative to ensure that the items used in the survey are asking the right questions to accurately measure the constructs under investigation, thereby contributing to the overall instrument validity. The researcher made a conscious decision to survey the wider technology adoption literature seeking previously-validated survey items used in studies that measured constructs similar to this study's constructs for the reasons given in Chapter Three, Sections 3.5.3.2 and 3.5.3.3. A list

of the survey instrument items used to measure the study variables, as well as the literature source that informed and helped in formulating the items, is provided in Table 5-2.

Translating the survey into the Arabic language using the back translation procedure described in section 3.5.3.5, as well as piloting the survey using Qualtrics before distributing the survey to the study participants, were important final steps in the survey design process. The pilot was conducted to address ensure the validity and reliability of the survey instrument (see sections 3.5.3.2 and 3.5.3.3 for details).

5.5 The Sample

A sample of 197 Abu Dhabi residents participated in the quantitative phase of this study. The descriptive analysis for the first part of the research instrument revealed the characteristics of the sample with regard to gender, educational background, occupation, and citizenship (refer to Appendix A - 14 to see tables of frequency).

The sample distribution according to participants' gender was fairly balanced, with 93 male (47.2 percent) and 104 female (52.8 percent). Individuals representing both UAE Nationals and Expatriates were included in the sample. The percentage of UAE nationals in the sample was 38.1 percent, 16 percent of whom were male and 22.1 percent female. On the other hand, the percentage of non-UAE Nationals was 61.9 percent, 66.4 percent of whom were male and 33.6 were female participants.

When comparing the gender and citizenship distribution pattern of the sample with the wider Abu Dhabi region population gender and citizenship distribution pattern, it is clear the Citizens Male and Non-Citizens Female categories are appropriately represented as shown in Figure 5-2.

However, female citizens are over-represented and male citizens are slightly under-represented; the researcher controlled for gender (see Section 5.3.3) to eliminate any possible gender bias.

Table 5-2: Measurement items and their reference to the literature.

Variables	Label	Measurement Items	Literature references
POS	POS1 POS2 POS3 POS4 POS5 POS6 POS7	I believe online systems are safe to interact with for financial purposes. I am confident that online systems have adequate security features. I am confident that online systems will protect my personal information. I am confident that online systems will keep my personal information confidential. I believe that online systems will not share my personal information with others. I worry about who might be able to see information that I enter in online systems. I hesitate when I provide confidential personal information online.	Yoo and Donthu (2001), Devaraj et al. (2002), Janda et al. (2002), AGIMO (2003), Murru (2003), Wolfenbarger and Gilly (2003), Chen and Thurmaier (2005), Parasuraman et al. (2005), Wangpipatwong et al. (2005), Collier and Bienstock (2006), Anthopoulos et al. (2007), Kumar et al. (2007), Shareef et al. (2007) Yenisey et al. (2005). Author self-developed.
OEX	OEX1 OEX2 OEX3 OEX4 OEX5 OEX6 OEX7 OEX8 OEX9 OEX10	I am confident using computers. I am afraid of making mistakes when I use a computer. I am aware of e-Government services in Abu Dhabi. I have seen information promoting online government services in Abu Dhabi. I have heard about online government services in Abu Dhabi through word-of-mouth. I have the skills required to use online government services. It is easy to learn how to use online government services. I have adequate computer technology at home to access online government services. I have adequate computer technology away from home to access online government services. The internet connection I use is costly.	AGIMO (2003), Murru (2003), Anthopoulos et al. (2007), Shareef et al. (2009) Wang (2002), AGIMO (2003), Tung and Rieck (2005), Anthopoulos et al. (2007), Kumar et al. (2007) Murru (2003), Author self-developed.
ISO	ISO1 ISO2 ISO3 ISO4 ISO5 ISO6 ISO7	People who influence me are comfortable using the internet. People who influence me are comfortable using online government services. People who influence me tell me about their negative Internet experiences. People who influence me tell me about their negative experiences with online government systems. People who influence me tell me about their positive Internet experiences. People who influence me tell me about their positive experiences with online government systems. People who influence me think that I should use online government services.	Venkatesh et al (2003). Al Awadhi and Morris (2008). Author self-developed.

MOT	MOT1 MOT2 MOT3 MOT4 MOT5	I think using online services is cheaper than interacting with government in other ways. I think using online services is easier than interacting with government in other ways. I think using online services is faster than interacting with government in other ways. I think using online services is more convenient than interacting with government in other ways. I think that the use of government services online is more flexible than interaction with government in other ways.	Yoo and Donthu (2001), Devaraj et al. (2002), Janda et al. (2002), Wang (2002), Wolfinbarger and Gilly (2003), Carter and Bélanger (2005), Chen and Thurmaier (2005), Parasuraman et al. (2005), Tung and Rieck, 2005; Wangpipatwong et al. (2005), Collier and Bienstock (2006), Fassnacht and Koese (2006), Kumar et al. (2007), Shareef et al. (2007). Venkatesh et al. (2003). Al Awadhi (2008). Author self-developed.
TRU	TRU1 TRU2 TRU3 TRU4 TRU5 TRU6 TRU7 TRU8 TRU9 TRU10	I think government employees know what they are doing. I trust online government systems in Abu Dhabi. I trust online government systems in other countries which I have lived in. I trust government employees in Abu Dhabi. I trust government employees in other countries which I have lived in. I think information provided by online government services can be trusted. I trust that somebody can be held accountable for any problems that occur in my use of online government systems. I think people who manage online government systems are good at their job. I think people who manage online government systems are helpful. I think people who manage online government systems are honest.	Loiacono et al. (2002), Accenture (2003), AGIMO (2003), Murru (2003), Chen and Thurmaier (2005), Parasuraman et al. (2005), Tung and Rieck (2005), Wangpipatwong et al. (2005), Collier and Bienstock (2006), Fassnacht and Koese (2006). AGIMO (2003), Kumar et al. (2007), Shareef et al. (2007), Shareef et al. (2009). Balasubramanian et al. (2003), Collier and Bienstock (2006), Fassnacht and Koese (2006), author self-developed.
ITU	ITU1 ITU2 ITU3 ITU4 ITU5	I will use online government systems in the next 3 months. I will use online government systems in the next 12 months. I prefer interacting with government online instead of face-to-face. I will only use online government systems if I have no other choice. I will only interact with government face-to-face if I have no choice.	Venketash et al. (2003); Al Awadhi (2008), author self-developed.

Additionally, further testing was conducted to determine if the model was affected by gender or citizenship bias. This analysis is presented in Section 5.7.4.4.

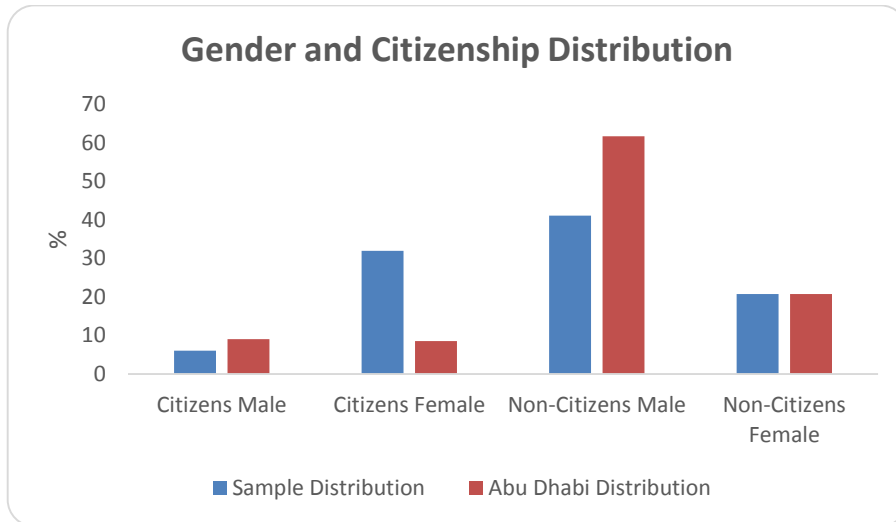


Figure 5-2: Sample Gender and Citizenship Distribution

The sample also included participants from different age groups. The majority of the study participants (35.4 percent) were between the ages of 25 to 34 followed by 35 to 44 (27.4 percent); 45 to 55 (15.2 percent); 15 to 24 (14.7 percent), 55 to 64 (6.1 percent) and age group 65 accounted for 1 percent of the sample as shown in Figure 5-3.

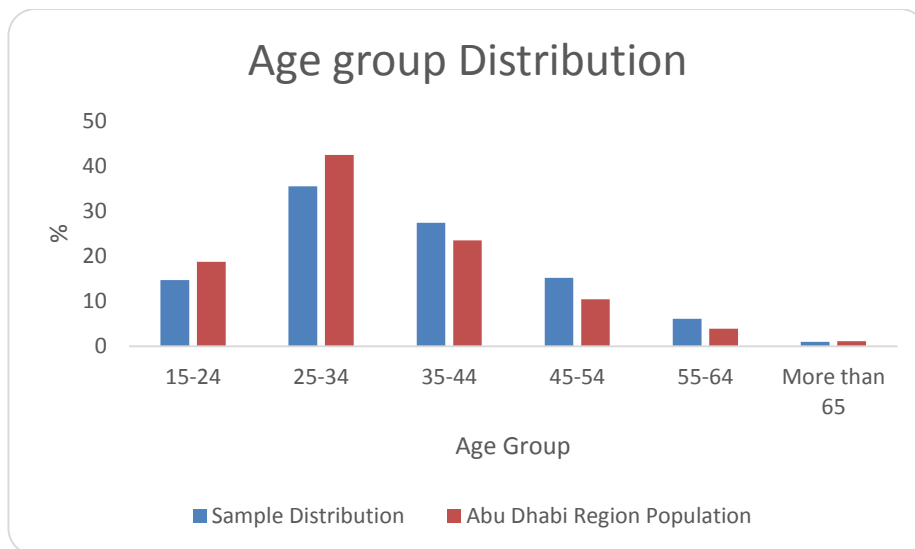


Figure 5-3: Sample Age group distribution

The demographic analysis based on educational attainment classification showed that university degree holders comprise 42.6 percent of the sample size while those who hold postgraduate degrees comprise 37.6 percent. The sample also included two other educational levels: high school, which comprise 17.8 percent of the sample size and the remaining 2 percent, have less than a high school certificate as shown in Figure 5-4.

The researcher examined the available educational attainment statistics in an attempt to compare the sample distribution with the wider population of the Abu Dhabi region. It was not possible to directly compare the level of educational attainment in the sample with that of the general population due to different categories used in the data available to the researcher about the general population. Nevertheless, comparison with available data suggests that tertiary educated people are over-represented in the sample; therefore, the analysis controlled for educational attainment as mentioned in Section 5.3.3.

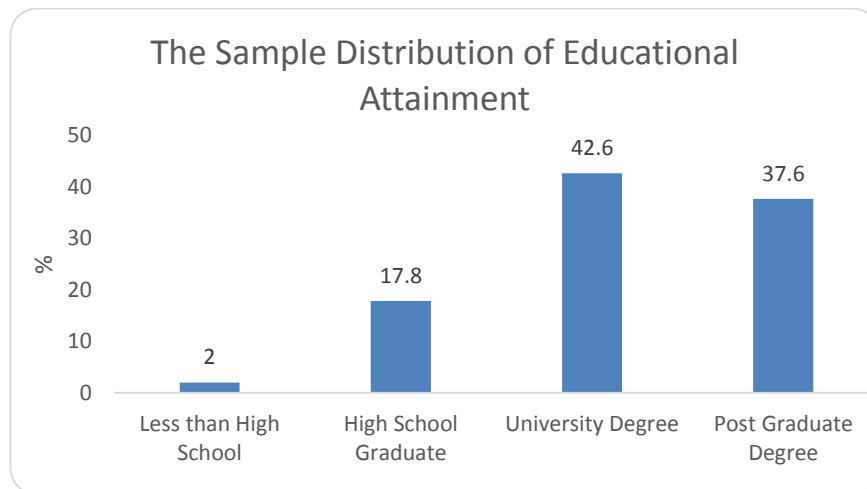


Figure 5-4: Sample Educational Attainment Distribution.

5.6 Screening the Dataset

Before commencing the Analysis of Survey Data (step 9 in Figure 3-4), a number of data screening tests were conducted to screen for missing data, outliers, normality, linearity, homoscedasticity and multicollinearity. The next section describes various

tests that were performed to ensure that the dataset met the recommended univariate, bivariate and multivariate assumptions.

5.6.1 Missing Data

As mentioned in section 3.5.3.5, the total number of returned questionnaires is 231, of which of 21 responses were from individuals living outside the Abu Dhabi region. These responses were immediately excluded. While some of these responses were complete, the researcher was interested in the opinions of only those individuals living in Abu Dhabi.

Prior to performing the data analysis, the data set was initially screened to identify missing data and unengaged responses. Of the remaining 220 questionnaires, the researcher identified that 13 were (6.1 percent) were from participants who started the survey but answered only the demographic part of the survey or dropped out before completing at least sixty percent of the survey. These questionnaires were removed from the dataset because they did not provide any useful data that could be used to test the study hypotheses proposed in section (5.3.2). As a result, 197 responses were considered valid for further analysis.

5.6.2 Outliers

An outlier is defined as an observation that is substantially different from the other observations. Because outliers have a large impact on the research results, they could have a disproportionate influence on the results obtained from most statistical techniques (Tharenou et al., 2007). Further, Sekeran and Bougie (2012) recommend that researchers carefully investigate outliers and ensure that they are correct observations representing the population. In the current research, since all scale items that measure the study constructs (described in section 5.3.1) are based on 11-point Likert-type scales, extreme value outliers do not exist, as responses at the extreme end of the scale (1 or 11) do not really suggest an outlier behaviour (Gaskin, 2015). Further, the researcher subscribes to Hair et al.'s (2010) views on the retention of extreme

observations in a dataset unless these observations are aberrant and not representative of the population because the retention of these observations ensures generalizability to the entire population; thus, no observations were eliminated.

5.6.3 Normality of Data

Normality refers to the shape of the data distribution for a particular metric variable and its correspondence to the normal distribution (Hair et al., 2010). The dataset was assessed for normality using a P-P plot. Both the normal P-P of the dependent variables (as shown in appendix A - 15) and the multivariate P-P plot of the regression standardized residual distribution (an example is shown in Figure 5-5) appeared to be normal.

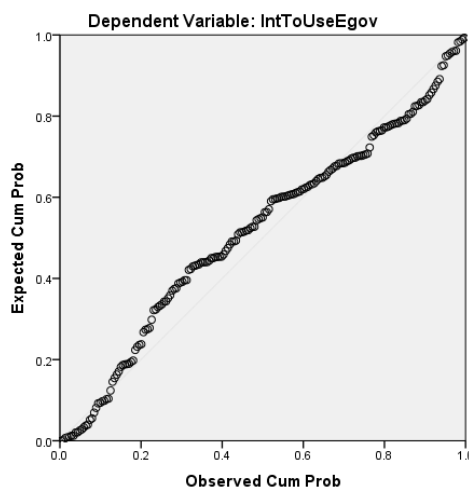


Figure 5-5: Normal P-P Plot of Regression Standardized Residual

Regarding the skewness of the dataset assessment, once again, since all the study variables are based on Likert-type scales, the researcher had no reason to exclude variables based on skewness unless they exhibited no variable as recommended by Gaskin (2015). Thus, rather than testing for skewness, the researcher focused on examining the dataset for kurtosis.

Hair et al. (2010) refer to kurtosis as the measure of the peakedness (or flatness) of a distribution when compared with a normal distribution. Kurtosis issues in the current study dataset were assessed by examining the descriptive statistics and by calculating

the z-score for each of the study variables as shown in Appendix A - 13. According to Kim (2013), the acceptable range within which a dataset can be considered normal, for a study that has medium-sized samples (sample size between 50 and 300), any absolute z-value must be less than 3.29, which corresponds to an alpha level of 0.05. When z-score values fall outside this cut-off limit, this indicates potential kurtosis issues. Applying this criterion to the dataset revealed that none of the study variables had kurtosis issues because their absolute z-value falls well below the cut-off limit (z-score values for all items fall between -2.385 and 1.092 as shown in Appendix A - 13). The researcher also evaluated the normality of the dataset using two other suggested criteria. Kurtosis can also be assessed using kurtosis values. For example, Sposito et al. (1983) report that a kurtosis value of ± 2.2 can be considered acceptable, arguing that problems may arise if the kurtosis values are outside this limit. Applying this criterion to the dataset revealed that almost all of the study variables fall well below this limit except one item OEX1 with a kurtosis value of 2.675; thus, this item was excluded from the dataset as it exhibited marginal kurtosis issues. Other scholars, such as Hair et al. (2010), recommend a stricter rule where ± 1 of the kurtosis value is considered as the cut-off limit. Most of the study items meet even this stringent requirement with others only marginally outside it. Hence, kurtosis was not considered to be an issue.

Based on the above discussion, all of the remaining variables fell within the acceptable data normality measures and were therefore deemed suitable for use in further analysis.

5.7 Data Analysis and Results

The data analysis process adopted in this study consists of two steps: step one focused on assessing the measurement model where Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) model fit, validity and reliability is tested; based on satisfactory results, step two (structural model) proceeded with hypotheses testing. Hair et al., (2010) asserts that the two-step approach has an advantage over the one-

step approach because it ensures that constructs have been validated prior to using them in the structural model, thus contributing to model-testing rigor. In addition, Schumacker & Lomax (2004) also argue for the two-step approach for similar reasons.

5.7.1 Structural Equation Modelling (SEM)

According to Ullman (2007), the Structural Equation Modelling (SEM) technique is considered adequate for investigations that involve multiple regression analysis comprising measured independent variables and a measured dependent variable. Further, Hair et al. (2010) state that SEM is a six-stage decision process technique (see Figure 5-6). SEM has become a popular multivariate approach that researchers frequently use to test theoretical models, which makes it suitable for testing the study hypotheses and achieving the objectives of this study. A typical SEM normally consists of two types of models:

- The measurement model (CFA) that represents the theory and which specifies how observed (measured) variables group together to represent latent variables, and
- The structural model that represents the theory specifying how constructs are related to each other in the model, which enables the researcher to test the hypothesised relationships between the constructs presented in this study.

In addition, Byrne (2013) regards SEM as a more robust technique compared to other older generation multivariate analysis techniques because: *first*, SEM has a confirmatory rather than an exploratory approach to the data analysis. While the first analytical step in this study (after confirming that the dataset meets the data normality requirements) is EFA, the aim of the analysis is to arrive at a valid measurement model (CFA) and the EFA is used as an interim step to achieve this goal as described in the next section. By contrast, most other multivariate procedures lack the confirmatory nature that SEM possesses and are essentially explanatory by nature. Using other multivariate procedures makes hypothesis testing a difficult task (if not impossible). *Second*, SEM provides explicit estimates of measurement errors variance parameters and has the ability of correcting for measurement errors while alternative methods are

incapable of this. *Third*, SEM procedures enable researchers to include both unobserved and observed variables (in the form of latent variables and measured variables) while older techniques are based on observed variables only. *Finally*, there are no widely and easily applied alternative methods for modeling multivariate relations (Bentler, 1980).

5.7.2 Results of Exploratory Factor Analysis (EFA)

Hair et al. (2010) state that EFA provides insight into the structure of items (indicators), and may be helpful in proposing the measurement model. In the current study, an EFA was conducted using Maximum Likelihood Estimate (MLE)⁴ and Varimax⁵ with Kaiser Normalization rotation to determine how, and to what extent, the questionnaire items (observed variables) measure their underlying intended constructs (latent variables). The results of the EFA are presented in Table 5-3 and are discussed in sections 5.7.2.1, 5.7.2.2 and 5.7.2.3.

Gaskin (2015) recommends that researchers perform a number of EFAs by iterating the factors until they reach a clean pattern matrix. Following this recommendation, a number of EFA iterations were attempted until the researcher arrived at the clean pattern matrix shown in Table 5-3. After eliminating indicators with poorly loaded values, the obtained pattern matrix revealed that the construct indicators grouped under their expected latent construct. The EFA also revealed that OEX indicators loaded under two factors (OEXa and OEXb) instead of one. A possible explanation for this is that the OEX construct actually consists of two sub-constructs. This possibility is further investigated during the CFA (section 5.7.4).

⁴ Maximum Likelihood Estimation was chosen in order to determine unique variance among items and the correlation between factors, and also to remain consistent with our subsequent CFA.

⁵ Varimax with Kaiser Normalization rotation is used for two reasons: (1) Varimax produces the maximum number of factors and (2) the researcher is seeking an orthogonal rather than oblique solution at this stage of the analysis due to the assumption that the factors are uncorrelated.

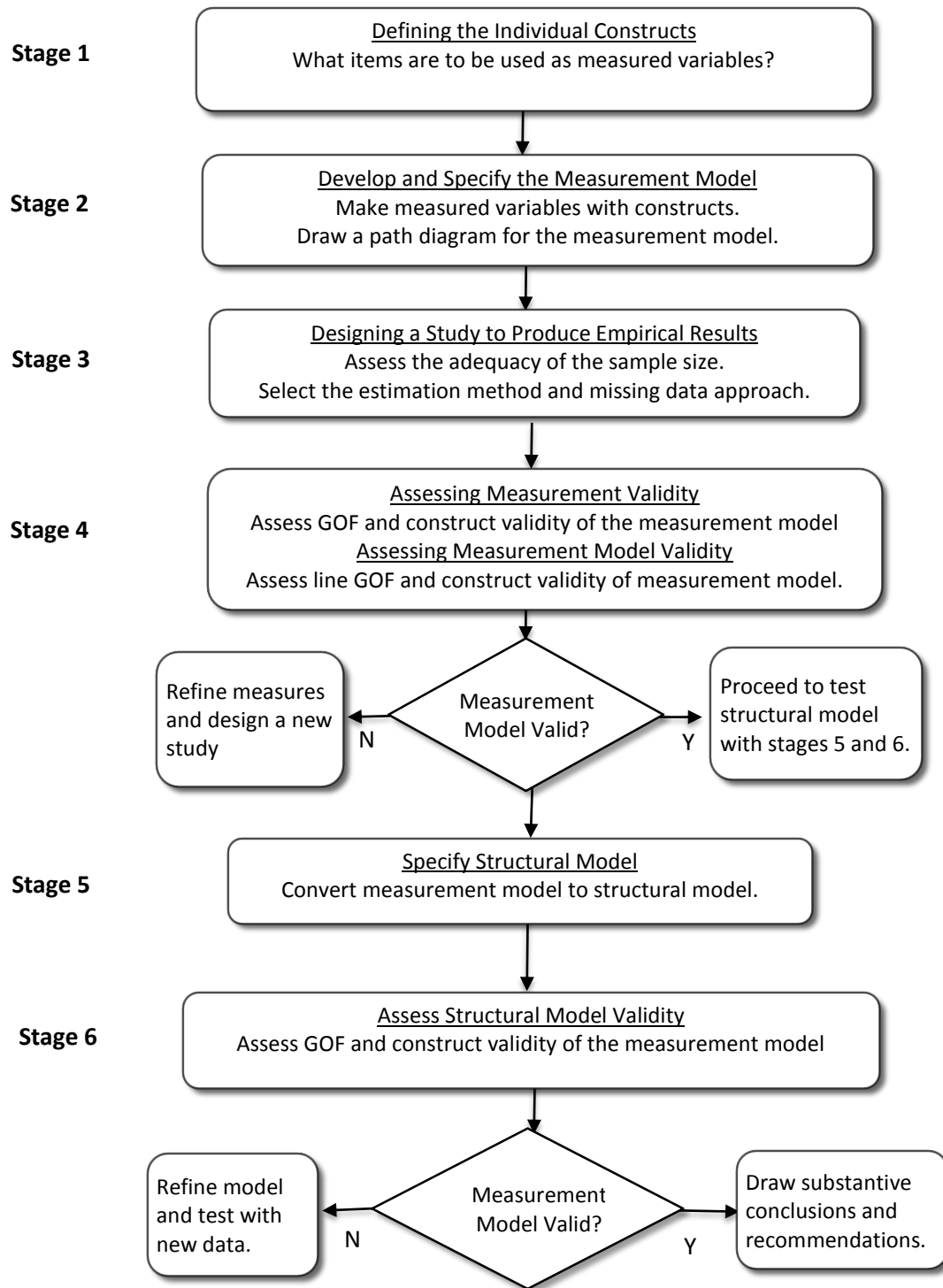


Figure 5-6: Six-Stage Process for Structural Equation Modeling.

(Source: Hair et al. 2010, p. 654)

Table 5-3: EFA Pattern Matrix

Items	Factor						
	1 (POS)	2 (TEG)	3 (ISO)	4 (MOT)	5 (OEXa)	6 (OEXb)	7 (ITU)
POS2	.925	.145	.144	.144	.067	.107	.072
POS4	.902	.219	.125	.062	.096	.056	.056
POS3	.885	.190	.120	.153	.106	.073	.060
POS1	.763	.085	.206	.149	.032	.183	.042
POS5	.762	.324	.158	.008	.069	-.015	.050
TEG9	.154	.878	.181	.079	.026	.012	.068
TEG8	.111	.874	.174	.130	-.037	-.018	.064
TEG10	.167	.712	.113	.066	.141	.212	.055
TEG2	.157	.677	.136	.175	.066	.065	.020
TEG5	.085	.612	.030	.194	.076	.056	.089
TEG7	.297	.600	.061	.046	.142	.125	.055
ISO6	.216	.221	.825	-.001	.094	.211	.117
ISO7	.167	.225	.723	.155	.191	.125	.072
ISO2	.101	.073	.649	.230	.154	.056	.221
ISO5	.193	.122	.637	.115	-.021	.127	.116
MOT3	.185	.169	.170	.922	.150	.079	.084
MOT2	.100	.209	.120	.745	.146	.119	.159
MOT5	.136	.228	.153	.641	.168	.091	.073
OEX6	.037	.088	-.002	.202	.768	.432	.097
OEX7	.173	.206	.191	.211	.723	.269	.078
OEX8	.123	.076	.219	.159	.665	.170	.256
OEX3	.023	.082	.115	.189	.186	.698	.120
OEX4	.212	.035	.114	.074	.262	.676	.145
OEX5	.080	.161	.200	-.002	.146	.629	.039
ITU2	.056	.196	.267	.166	.181	.140	.884
ITU1	.189	.107	.303	.191	.226	.248	.711

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

As noted in section (3.5.3.2), the lack of a universally agreed upon instrument that measures users' intention to use e-government services made it necessary to design a new measurement instrument rather than use an existing one.

The EFA was conducted in order to: *first*, test whether the survey items designed to measure the study constructs actually load together as expected; *second*, detect any possible cross loading; and *third*, determine whether the factors extracted met the criteria of reliability and validity, thus contributing to the instrument validation process described in Chapter Three, Section 3.5.3.3.

The next Sections (5.7.2.1, 5.7.2.2 and 5.7.2.3) establish the appropriateness, validity and reliability of the EFA results.

5.7.2.1 Appropriateness of the Data (Adequacy)

The KMO and Bartlett’s test for sampling adequacy was used to determine the suitability of the dataset for factor analysis. The KMO test results were significant with a KMO measurement score of 0.884 (as shown below) which is more than the recommend level of 0.7 and the communalities for each variable were sufficiently high (all above 0.4 and most above 0.6), thus indicating that the selected variables were adequately correlated for a factor analysis. Additionally, the reproduced matrix had only 4 percent non-redundant residuals value, which is lower than the recommended 0.05.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.884
Bartlett's Test of Sphericity	Approx. Chi-Square
	3940.380
	Df
	325
	Sig.
	.000

As mentioned in Chapter Three, Section 3.5.3.3, the second and third components of the instrument validation process proposed by Straub (1989) focus on Construct Validity and Reliability which are discussed in the next two sections (5.7.2.3 and 5.7.2.2).

5.7.2.2 Construct Validity

Hair et al. (2010) define construct validity as the extent to which a latent variable (proposed by the theory) is actually represented by the set of measurement variables designed to measure it. According to Bagozzi, (1980), researchers can claim *Construct validity* by establishing two forms of validity: *convergent* and *discriminant* validity. Therefore, in order to establish construct validity, the researcher assessed both the convergence and discrimination of measurement items.

Convergent Validity: is defined as the degree to which a set of measurement items (indicators), within a single construct, converge or share a high proportion of the variance in common (Hair et al., 2010). That is to say, convergent validity assesses whether the items measuring the construct group together (in other words, are items highly correlated?) to form a single construct. Convergent validity is established by assessing factor loading, Average Variance Extracted (AVE) and Reliability. The AVE and reliability are discussed in section 5.7.4.2.

The size of the factor loading is one of the important considerations that should be assessed when establishing convergent validity. High loadings on a factor indicate high convergent validity (Hair et al, 2010.) The cut-off values for an acceptable factor loading depend on the sample size. Generally, the smaller the sample size the higher is the factor loading as shown in Table 5-4.

The assessment of the factor loadings in this study was guided by Hair et al's recommendation: for a sample size of 197, the minimum factor loading required (for each factor) should be more than 0.40. The obtained factors demonstrated sufficient convergent validity, as the loading for each factor was above the recommended threshold for the study sample size (see the Pattern Matrix presented in Table 5-3).

Discriminant Validity: is the second element that needs to be assessed to claim construct validity. Discriminant validity refers to the degree to which a construct is truly distinct from all other constructs; thus, obtaining high discriminant validity

confirms that the construct is different from all other constructs and provides sufficient evidence that the construct captures some phenomena not captured by other constructs (Bagozzi, Yi and Phillips, 1991; Hair et al. 2010).

Table 5-4: Significant Factor Loadings based on Sample Size

Sample Size	Sufficient Factor Loading
50	0.75
60	0.70
70	0.65
85	0.60
100	0.55
120	0.50
150	0.45
200	0.40
250	0.35
350	0.30

Source: Hair et al. (2010, p. 117).

During the EFA in the current study, discriminant validity was assessed using two methods: (1) examining factor cross-loading to see if the same variable loads on multiple factors and (2) examining the factor correlation matrix to see whether there is a strong correlation between constructs. First, the research examined the pattern matrix to determine any possible cross-loading issues. No significant cross-loading detected as each of the factors presented in the pattern matrix loads exclusively in only one factor as shown in Table 5-3. Second, after examining the factors correlation matrix, the factors also demonstrated sufficient discriminant validity as the correlation matrix (presented in Table 5-5) shows no correlation above the recommended values of 0.700 (Hair et al., 2010).

Table 5-5 Factor Correlation Matrix:

Factor	1 (POS)	2 (TEG)	3 (ISO)	4 (MOT)	5 (OEXa)	6 (OEXb)	7 (ITU)
1 (POS)	1.000	.428	.440	.324	.332	.303	.288
2 (TEG)	.428	1.000	.427	.360	.316	.247	.298
3 (ISO)	.440	.427	1.000	.379	.394	.385	.516
4 (MOT)	.324	.360	.379	1.000	.469	.312	.418
5 (OEXa)	.332	.316	.394	.469	1.000	.619	.488
6 (OEXb)	.303	.247	.385	.312	.619	1.000	.404
7 (ITU)	.288	.298	.516	.418	.488	.404	1.000

Extraction Method: Maximum Likelihood.

Rotation Method: Promax⁶ with Kaiser Normalization.

Therefore, the results presented in this section show that the measurement items meet both the convergent validity and discriminant validity requirements, and therefore the study constructs are considered valid.

5.7.2.3 Reliability

Sekaran et al. (2009) state that reliability is an assessment of the consistency and stability of the measuring instrument. Similarly, Hair et al. (2010) refer to reliability as an assessment of the extent to which a variable is consistent in what it is intended to measure. The reliability of the study constructs was established by calculating the Cronbach's alpha for each construct. Hair et al. (2010) assert that a construct item that scores 0.7 or above is considered reliable. All the study constructs were above this threshold (as shown in Table 5-6) and therefore all of the study constructs are considered reliable.

Finally, the total variance explained by the extracted seven factors is 70.6%, with all extracted factors having Eigenvalues above 1.0 except one, which was close at 0.925 as shown in Appendix A - 18. The threshold Eigenvalue of 1.0 is somewhat arbitrary (Hayton et al., 2004), and as the one factor with the slightly lower Eigenvalue was the

⁶ Promax rotation is used here instead of Varimax as only Oblique rotation methods produce a factor correlation matrix.

dependent variable, it was impractical to discard this factor. Hence, given that all the factors extracted are acceptable, analysis proceeded to the CFA.

Table 5-6: Cronbach’s Alpha values for the study constructs.

Construct	Cronbach’s Alpha
POS	.951
MOT	.882
OEX	.848
OEXa	.800
OEXb	.777
ISO	.861
ITU	.918
TRU	.894

5.7.2.4 Analysis of Survey Data using Composite Variables.

After establishing the validity of the items that “survived” the EFA scrutiny, the researcher produced a computed variable for each group of items and calculated the Mean and the Standard Deviation (SD) for each computed variable (construct) using SPSS Version 22 as shown in Table 5-7. The results obtained indicated that participants agree that use of online government systems will be beneficial to them as the mean score of the MOT construct was (8.73) with a SD of (2.05). In addition, the participants believed that online systems in the UAE are trustworthy as the means score calculated for the TRU construct was (7.98) with as SD of (1.90). Further, the results obtained indicate that participants generally agree that their significant others reassure them about the views they have regarding the use of online government systems. The mean of the computed variable ISO was (7.23) with a SD of (2.11).

However, the results obtained also indicated that the survey participants’ views and opinions about POS and OEX constructs varied. POS had the most diverse opinion compared to all other constructs followed by OEX where the SDs recorded for the

POS and AWR & ACC (the principle components of the OEX construct) were (2.62), (2.42) and (2.45) respectively.

Table 5-7: Computed values for the study constructs.

		TRU	POS	MOT	OEXa (ACC)	OEXb (AWR)	ISO
N	Valid	197	197	197	197	197	197
	Missing	0	0	0	0	0	0
Mean		7.98	6.87	8.73	8.74	7.36	7.23
Std. Deviation		1.90	2.62	2.05	2.46	2.42	2.114
Minimum		2	1	1	1	1	1
Maximum		11	11	11	11	11	11

5.7.3 Cluster Analysis

Prior to conducting the next step in the SEM analysis, the CFA, the researcher conducted a cluster analysis of the dataset using the constructs identified during the EFA.

Although performing cluster analysis is not a required step in the SEM, the researcher conducted cluster analysis for two main reasons: first, it enables the researcher to discover natural groupings (or clusters) within the dataset that would otherwise not be apparent using EFA or CFA. Second, conducting such analysis on the dataset enables the researcher to gain more insights into the participants' views/perceptions regarding their intention to interact with government agencies using online services. The insights gained from this analysis and the data collected during the qualitative phase of the current study will enable the researcher to answer the first research question in this study.

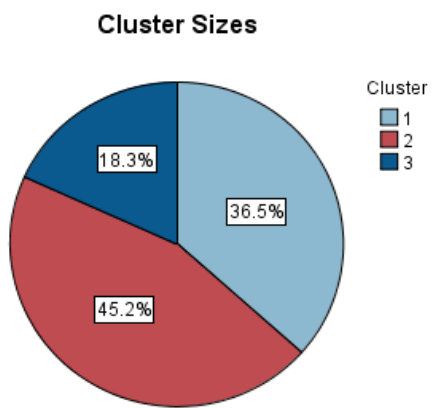
Hence, a two-step method of cluster analysis was performed, using SPSS 22.0, to segment the survey participants' responses based on their intention to use online government services (ITU). First the dataset was clustered using the ITU, TRU and

MOT as the input variables and the POS, ISO and OEX as the evaluation fields. The model summary presented in Figure 5-7 shows that the solution obtained by SPSS is satisfactory as indicated by the *silhouette measure of cohesion and separation* measure. The cluster size results also provide an indication of the quality of the solution where the ratio of sizes of the largest cluster to the smallest cluster is (2.47) and no single factor is predominant. The results obtained from this analysis reveal that the dataset is naturally grouped into three distinct segments. The biggest cluster represents (45.2%) of the participants followed by (36.5%) and (18.3%).

The results of the cluster comparison (shown in Figure 5-8) indicate that participants are segmented into three groups: the “optimist” the “pessimist” and those “in between”. The optimist group is represented by Cluster1 where the results show that participants who belong to this cluster have strong intention to use online government services in the future; they are motivated; they tend to think that government and government and online government systems are trustworthy; they perceive online services to be safe; they have had good online experiences and their significant others are more involved in their online behaviour.

In contrast, the pessimists represented by cluster 3, showed little intention to use online government services in the future; their motivation to use online government services is limited; they lack trust in government and government and online government systems; they have negative perceptions about the safety and privacy of online government services; their online experiences are somewhat limited and their significant others are less involved in their online behaviour.

The thirds group of participants, represented by cluster 2, holds neither very negative nor very positive views regarding all the constructs measured. It is clear from the cluster analysis results that the participants in this group are not terribly enthusiastic about using online government in the future.



Model Summary

Algorithm	TwoStep
Inputs	3
Clusters	3

Cluster Quality



Size of Smallest Cluster	36 (18.3%)
Size of Largest Cluster	89 (45.2%)
Ratio of Sizes: Largest Cluster to Smallest Cluster	2.47

Cluster	1	2	3
Label			
Description			
Size	36.5% (72)	45.2% (89)	18.3% (36)
Inputs	ITU_comp 10.29	ITU_comp 6.78	ITU_comp 4.58
	TRU_comp 9.17	TRU_comp 8.06	TRU_comp 5.41
	MOT_comp 10.00	MOT_comp 8.71	MOT_comp 6.25
Evaluation Fields	POS_comp 8.04	POS_comp 6.76	POS_comp 4.81
	OEX_both 8.08	OEX_both 8.01	OEX_both 6.08
	ISO_comp 8.57	ISO_comp 6.78	ISO_comp 5.69

Figure 5-7: Cluster Analysis Models Summary and Cluster Sizes.

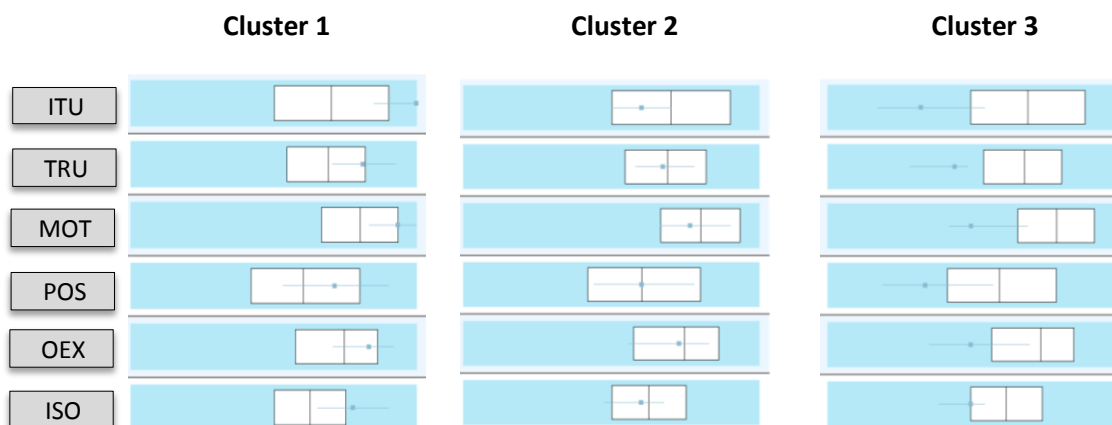


Figure 5-8: Cluster Comparison.

The three segments described above are represented in the scatter diagram shown in Figure 5-9.

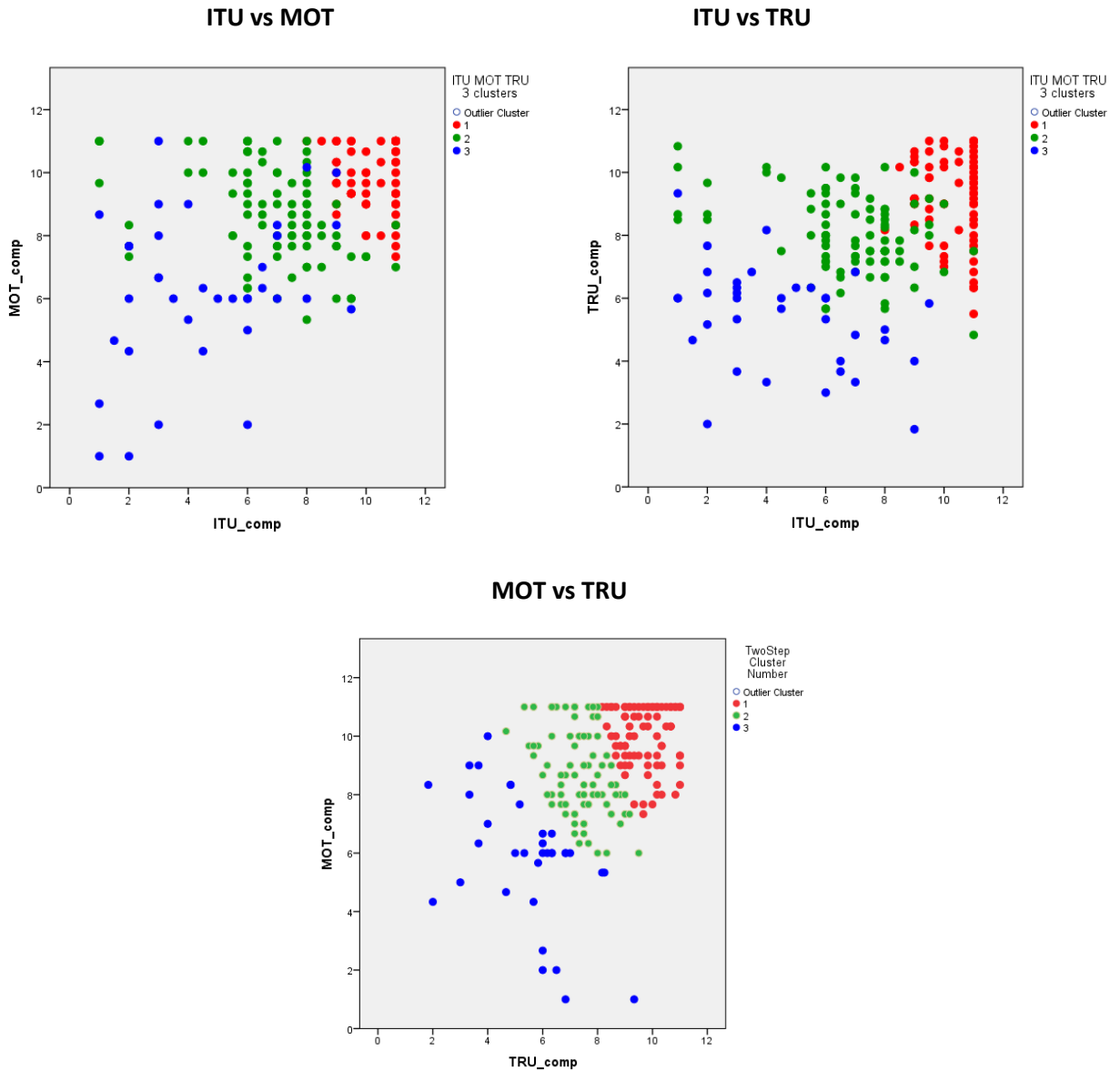


Figure 5-9: Scatter Diagram of ITU vs. MOT and TRU.

The researcher found similar clustering pattern when a series of cluster analyses was performed using ITU with each of the study constructs. The results of these are presented in Appendix A - 12.

5.7.4 Results of Confirmatory Factor Analysis (CFA)

As shown in Figure 5-6, the next stage in the SEM procedure, stage 4, focuses on assessing the measurement model validity. The current study applies the CFA approach to evaluate the measurement model. Hence, the researcher drew the measurement model on the AMOS (version 22) graphics software using the factors extracted at the end of the EFA.

As shown in Figure 5-10, the model has a number of measurement items/indicators (the items that “survived” the EFA). Each indicator is shown in the CFA using rectangular shapes (AMOS default shape for observed variables/indicators) with labels that match the statement used on the Likert scale (see Table 5-1 that summaries the study variables, their labels, the Likert scale statement). The latent variables are shown using oval shapes, and a single-headed arrow is used to indicate a causal path from a construct to an indicator. Further, double-headed arrows are used to indicate covariance between constructs. The figure also contains a circle indicating the error term for each observed variable/indicator.

5.7.4.1 Model Fit

After the researcher ran the initial CFA using AMOS, the modification indices output were consulted to determine if there was opportunity to improve the initial model obtained. The researcher followed the procedure recommended by Kenny (2015) for improving the obtained initial model by:

- (1) examining the modification indices;
- (2) identifying error terms with the largest modification indices (those are good candidates for covarying). This should be done while observing that error terms should not be co-varied with observed or latent variables, and the error terms to be co-varied are part of the same factor;

- (3) running the model after completing the modification to assess the model fit statistics for the newly-obtained model (after modification) to see if the estimated model statistics has improved as a result of modification.
- (4) iterating the process and again assessing the model fit.

Accordingly, the error terms (e1 and e6, e2 and e3, e3 and e6, e4 and e5, e7 and e10, e10 and e11, e21 and e22 and e22 and e23) have been co-varied as shown in Figure 5-10 which resulted in a better model fit as described below.

Hair et al. (2010) state that the most important step in the SEM procedure is to assess the measurement model's validity. They state that measurement model validity can be achieved by: *first*, establishing acceptable levels of Goodness-of-Fit (GOF) and *second* providing evidence of the constructs' validity. Model fit is important because it compares the researcher's theory to the reality by assessing the similarity between the estimated (theory) and observed (reality) covariance matrix.

Further, they recommend that researchers use multiple fit indices including: the CHI-SQUARE (χ^2) value and the associated *df*; one incremental fit index (i.e. CFI, GFI, TLI ..etc.); one absolute fit index (i.e. GFI, RMSEA, or SRMR); and one badness-of-fit index (i.e. RMSEA, SRMR, etc.) when assessing a model's GOF. Applying these guidelines in the current study, the researcher assessed a number of models (each time applying Kenny's recommend procedure described above) until the model presented in Figure 5-10 (which has satisfactory GOF) was obtained. The model fit indices, the obtained value for each index as well as the recommended (acceptable) value for each index is presented in Table 5-8.

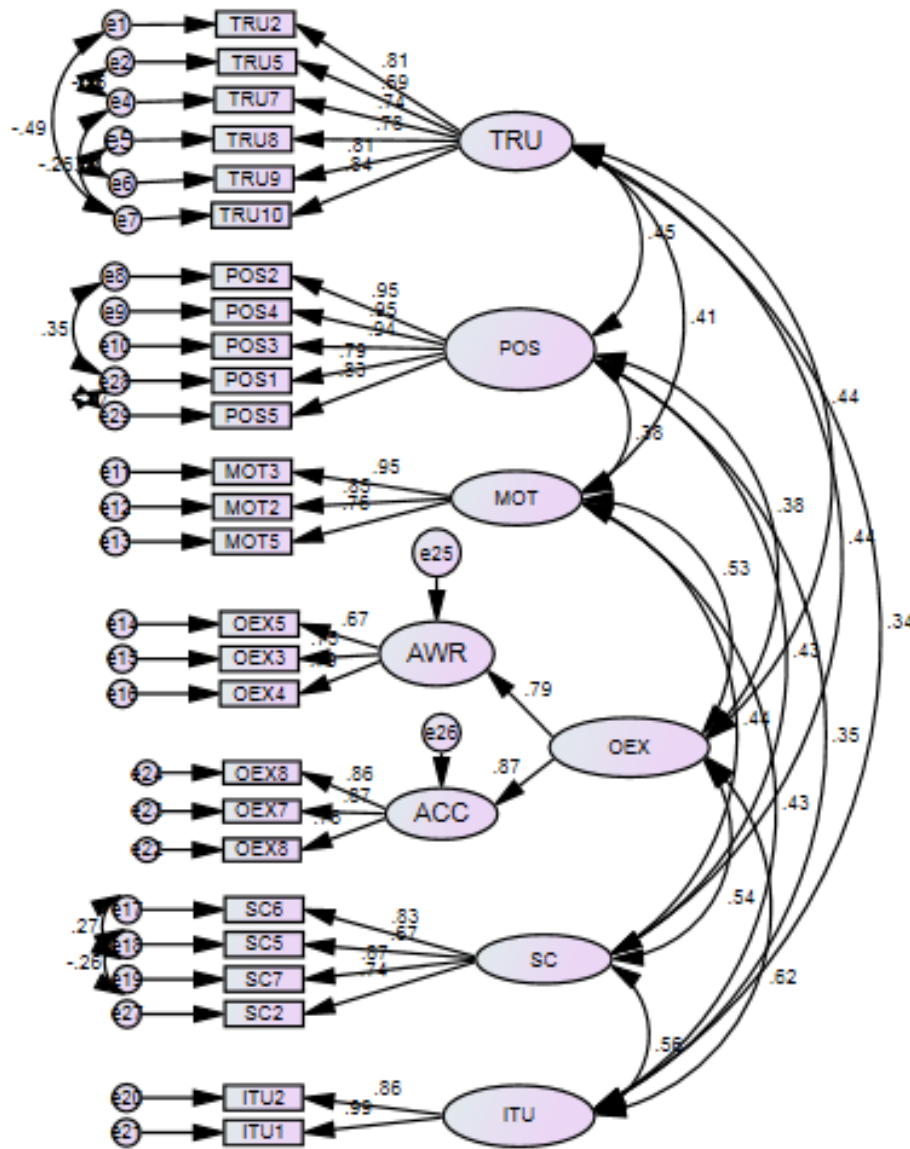


Figure 5-10: CFA measurement theory model for E-government Adoption.

Table 5-8: Measurement Model GOF indices

Metric	Observed value	Recommended (Hair et al., 2010)
cmin/df	1.646	Between 1 and 3
CFI	0.954	>0.950
RMSEA	0.057	<0.080
PCLOSE	0.10	>0.050
SRMR	0.054	<0.090

5.7.4.2 Validity and Reliability

To establish the second component of the measurement model validity (providing evidence of constructs validity) the researcher assessed both the validity and reliability of the measurement model constructs using Composite Reliability (CR) and the Average Variance Extracted (AVE). Hair et al. (2010) state that CR can be established if its value is more than 0.7. Section 5.7.2.2 explored the validity and reliability of the study construct after the EFA. In this section, the construct validity and reliability of the study constructs were further tested using AVE and CR. The results obtained, shown next, reconfirm that the constructs have both convergent and discriminant validity.

For a researcher to claim convergent validity after conducting CFA, Hair et al. (2010) recommend that the AVE value for each construct should be more than 0.5, and at the same time, the square root of the AVE should be greater than the inter-construct correlations. Accordingly, the construct validity of the measurement model was assessed using these guidelines. The researcher used the statistical tool provided by Gaskin (2015) to establish the validity of the constructs. The tool uses AMOS for the measurement model to calculate the CR and AVE, and apply the construct validity and reliability criteria explained earlier to produce a summary report that highlights the construct(s) violating any of the validity and reliability criteria with comments about what is causing the validity issue. In the event that no validity or reliability issues are detected, the tool returns a 'no validity concern' message indicating that the constructs meet all the validity and reliability criteria. After performing this test, the tool returned a 'no validity concern' message as shown in Table 5-9. The results presented in the table establish the following: First, *convergent validity* was achieved because all AVE values were above the threshold of 0.5. Second, *discriminant validity* was achieved because the square root of the AVE value for each construct (on the diagonal in the table) is greater than the inter-construct correlations for that construct. Third, *construct reliability* was achieved because the CR value for each factor is above

the recommended threshold of 0.7. Thus, the requirements of validity and reliability for the measurement model construct are met.

Table 5-9: Validity and Reliability Assessments for the Measurement Model.

	CR	AVE	POS	MOT	OEX	ISO	ITU	TRU
POS	0.953	0.802	0.895					
MOT	0.889	0.730	0.378	0.854				
OEX	0.818	0.693	0.382	0.529	0.833			
ISO	0.861	0.611	0.434	0.444	0.537	0.782		
ITU	0.923	0.857	0.354	0.434	0.615	0.558	0.926	
TRU	0.902	0.608	0.453	0.412	0.438	0.440	0.340	0.780

No Validity Concerns - Wahoo!

5.7.4.3 Common Method Bias

Because the data for both the Independent Variable (IV) and the Dependent Variable (DV) were collected using a single instrument (a survey), the researcher conducted a Common Method Variance (CMV) test, sometimes referred to as common bias method, to determine if CMV was affecting the measurement model results. The researcher assessed the possibility of CMV using the Harman single factor and Common Latent Factor (CLF) approach. According to Craighead (2011), Harman's single factor test is one of the most commonly used CMV detection and control measures in many disciplines including IS (Jarvenpaa and Majchrzak 2008; Pavlou et al. 2007). In this test, the researcher loads all the study constructs in one factor during an EFA to measure the amount of variance explained by this factor. The assumption is that if CMV is an issue, then the majority of variance (more than 50 percent) would be explained by this single factor. When performing this test in the current study, the amount of variance explained by a single factor was 28.507 percent – well below the 50 percent threshold – indicating that CMV is not an issue.

Hult et al. (2006) argue that performing the Harman single factor test during the CFA provides a more robust assessment of the effect of CMV on the results than

performing the test during EFA. This approach enables researchers to detect CMV by comparing the chi-square of a single factor model (where the entire study construct become a second order factors of a common factor) to a multifactor model. A significant difference in the chi-square and model fit indices indicates that CMV is not an issue. When this test was performed in the current study, the Chi-square value of the single factor model was 5.991; in addition, all other model fit indices were poor (CFI = 0.622, RMSEA = 0.160 and PCLOSE = 0.000). Comparing these results to the model multifactor model, the chi-square value and model fit indices, presented in Table 5-8, further confirm that CMV is not an issue in the current study.

Despite the many merits of the Harman single factor test such as the ease of conducting the MVC test using post hoc statistical remedies, scholars such as Podsakoff et al. (2003) questioned the rigor of Harman's single factor test, stating that Harman's single factor test lacks sensitivity. Therefore, the effect of CMV on the measurement model results was further assessed using CLF.

The researcher added a latent factor to the CFA model presented in section 5.7.4.1 using AMOS, and then all observed items in the model were connected to the newly-added latent factor. The modified measurement model was run in AMOS and the standardized regression weights from this model were compared with the standardized regression weights of the model without the CLF. Gaskin (2015) states that a large difference between the standardized regression weights of the two models indicates the presence of CMV. The comparison revealed that no significant difference was observed before and after including the CLF in the model (see Appendix A - 20). In addition, the regression weights of both models were compared to see if the correlation between the indicators and their corresponding constructs had been affected by including the latent factor which, if detected, indicates the presence of CMV. As shown in Appendix A - 19, the P values were not affected by the inclusion of the latent factor in the model, providing further evidence that CMV is not an issue.

5.7.4.4 Invariance Test

The last assessment that the researcher performed on the measurement model (before creating composite variables for the structural model) was the configural and metric invariance assessment (i.e. the composite variables mean the same thing for the different groups assessed). This assessment was done during the CFA mainly to validate that the factor structure and loadings were sufficiently equivalent across the different sample groups (gender and citizenship). The researcher grouped the data into four groups (male, female UAE nationals and expatriates). The GOF of CFA with these groups was then assessed; the model fit of the measurement models (with the different groups loaded separately in AMOS) had adequate fit (CMIN/df = 1.706; CFI 0.918, RMSEA 0.035 and PCLOSE 1.000) indicating that the model was configurally invariant.

In addition, the model was also assessed for metric invariant using Gaskin's (2015) statistical tool. Appendix A - 22 shows the results obtained for both groups (male vs. female and UAE nationals vs. expatriates). The results indicate that the measurement model meets the criteria for metric invariance (at least one of the construct indicators has an insignificant z-score) for gender and citizenship. This result also suggests that the imbalance of gender and citizenship in the sample described in section 0 had no impact on the measurement model.

5.8 The Structural Models

Prior to assessing the structural model, the linearity, homoscedasticity, and multicollinearity multivariate assumptions were tested. As linearity of the relationship between the dependent variables (DV) and independent variable (IV) is an implicit assumption in many statistical techniques including the Structural Equation Modelling (SEM) technique used in this study, the linearity of the relationship between IV and DV was tested using two approaches.

First, the linear relationship between the IV and DV was tested by performing an OLS linear regression between each IV and DV pair. All significance values were less than the recommended 0.05; thus, the relationships can be considered linear. Second, examination of the residuals scatter plot revealed that residuals have a straight-line relationship with predicted DV values. If nonlinearity were existing, the overall shape of the scatter plot would be curved rather than being linear. The bivariate scatter plots output for IVs and the DV all exhibited a straight-line relationship, thus confirming that the relationship meets the linearity assumption.

Further, according to Hair et al. (2010), homoscedasticity refers to assumption that the DV exhibits an equal level of variance across the range of IVs. Hair states that homoscedasticity is desirable because “the variance of the dependent variable being explained in the dependence relationship should not be concentrated in only a limited range of the independent values” (p. 74) i.e. the standard deviations of error of prediction are approximately equal for all predicted DV values. As a result, the scatter plot obtained using SPSS (see Figure 5-11) was evaluated to identify whether the deviations of errors was approximately equal or the gap (band) becomes wider at larger predicted values which, if spotted, suggests a heteroscedastic relationship (Tabachnick & Fidell, 2007). The residuals scatter plots showed no pattern of increasing or decreasing residuals, thus indicating that the multivariate homoscedasticity assumption was met.

The final test performed on the dataset prior to commencing the testing of the study hypotheses as well as building and analysing the structural models was the multicollinearity tests. According to Pallant (2007) multicollinearity occurs when two (or more) IVs are highly correlated. Tharenou et al. (2007) state that the presence of multicollinearity can cause computational and interpretational issues (i.e. the variance the IVs explain in the DV are overlapping with each other instead of having each IV explains a unique variance in the DV). Thus, the researcher investigated the absence of multicollinearity (before proceeding with further analysis) by calculating the

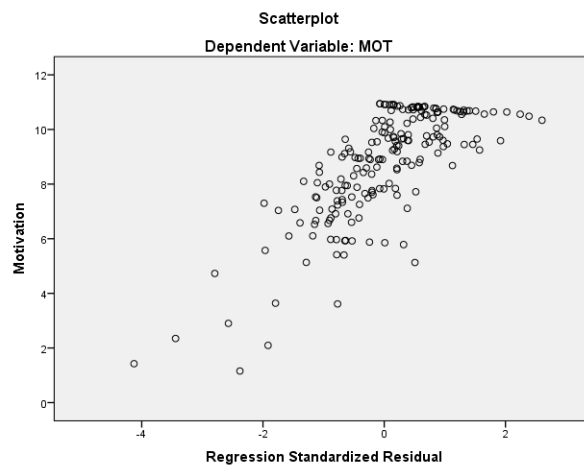
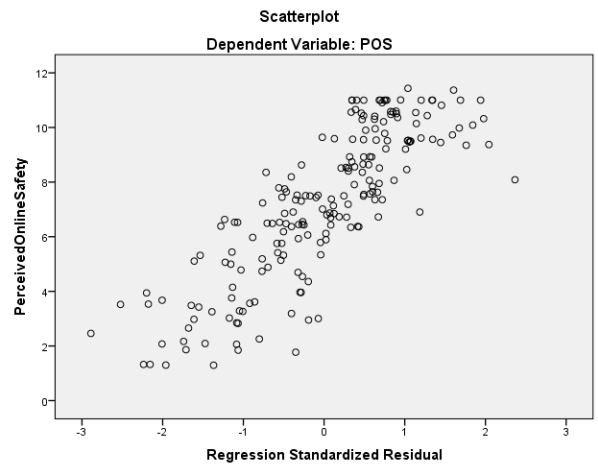
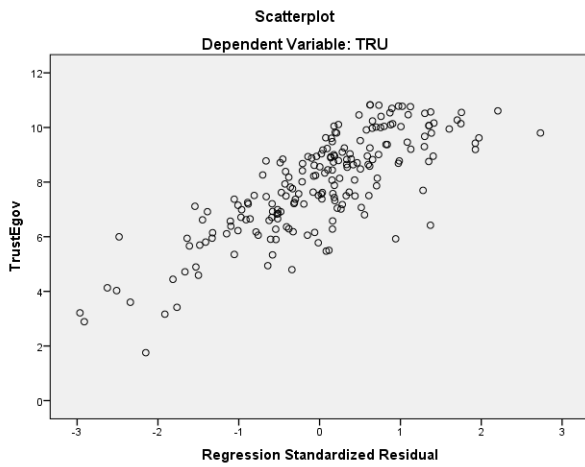
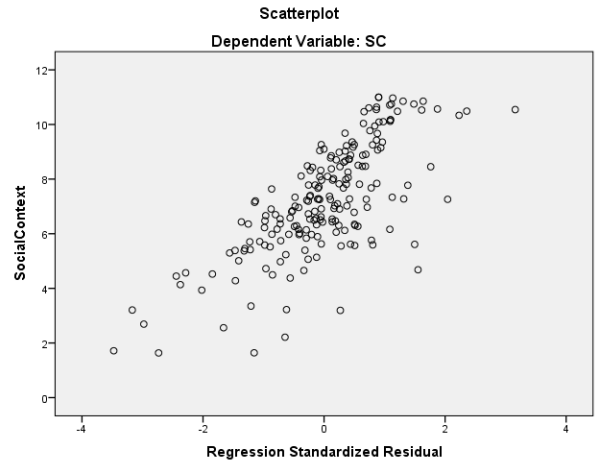
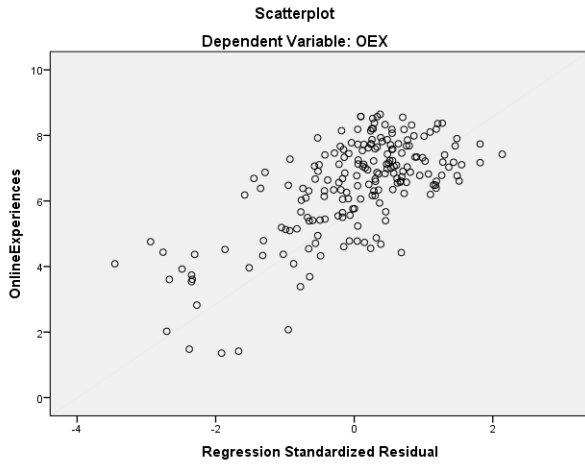


Figure 5-11: Scatterplot diagrams using Regression Standardized Residual of the study constructs

Variable Inflation Factor (VIF) for each independent variable after running a multivariate regression several times (each time selecting one of the IV as a DV to test for multicollinearity among the five IVs). Multivariate correlation was assessed through the residual analysis and the coefficients output produced by the multivariate regression analysis tests. The VIF results indicated the absence of multicollinearity as all VIF were below 3.00 (the cut-off limit recommended by Hair et al.) and the tolerance value output was more than 0.10 confirming the lack of multicollinearity between the IVs (see Appendix A - 21).

5.8.1 Hypotheses Testing Results

After establishing the measurement model fitness and validity, the next step in the process is to test the study hypotheses, presented in section 5.3, using a structural model. According to Hair et al. (2010), the structural model emphasises the nature and magnitude of the relationships between study constructs rather than focusing on the relationships between latent constructs and observed variables, which is the focus of the measurement model. Hence, the transition from measurement model to structural model requires specifying the relationship between the constructs and the nature of each relationship as depicted in the theoretical research model presented in section 5.3.

The researcher used AMOS version 22 to create the structural model. The model was created by adding composite variables (created using the factor scores while the CLF was present) depicted as rectangles; error terms for each dependent variable in the model were depicted as circles; and straight single-headed arrows from the IVs to the DVs are used to show the direct path (relationships) as shown in Figure 5-12. The structural model was then assessed for validity using the GOF indices recommended by Hair et al. (2010). As shown in Table 5-10, the structural model has adequate GOF indices.

All hypotheses mentioned in section 5.3.2 were tested using the structural model while controlling for Gender, Education Level, Age Group and Previous Usage. The results

of the hypotheses testing are summarized in the Hypotheses Summary table below (Table 5-11).

Table 5-10: Structural Model Indices obtained vs. recommended values.

Metric	cmin/df	CFI	RMSEA	PCLOSE	SRMR
Recommended Value	Between 1 and 3	>0.950	<0.080	>0.050	<0.090
Observed value	1.546	0.976	0.037	0.923	0.077

As shown in Figure 5-12, all structural paths showed significant results except the path between MOT to ITU and TRU to ITU; as a result, hypotheses H1, H2, H3, H4, H5, H6, H9 and H10 were supported; however, hypotheses H7 and H8 were not supported.

Table 5-11: Hypotheses testing results.

Hypothesis	IV	Path	DV	Estimate	S.E.	C.R.	P value	Label
H1	POS	→	MOT	.096	.046	2.118	.034*	Supported
H2	POS	→	TRU	.178	.042	4.270	***	Supported
H3	OEX	→	MOT	.629	.097	6.498	***	Supported
H4	OEX	→	TRU	.360	.089	4.025	***	Supported
H5	ISO	→	MOT	.127	.069	1.845	.065+	Supported
H6	ISO	→	TRU	.152	.063	2.410	.016*	Supported
H7	MOT	→	ITU	.029	.070	.410	.682	Not Supported
H8	TRU	→	ITU	-.039	.074	-.531	.596	Not Supported
H9	OEX	→	ITU	.528	.126	4.187	***	Supported
H10	ISO	→	ITU	.377	.071	5.293	***	Supported

Note: *** p<.001; ** p<.01; * p<.05; + p<.10

In addition, all structural paths between the DV and the controls are insignificant except the path between the Previous Usage (PU) and the DV (ITU), which showed a significant P value with an estimate of (0.32). This indicates that the controls gender, educational, level and age group have no or little effect on variance explained by the IV on the DV. The significant path found between the PU and ITU was investigated

by assessing the effect of this control on the model, and indeed all other controls by testing the structural model's GOF metrics and the DV's R square value in the absence of the controls including PU.

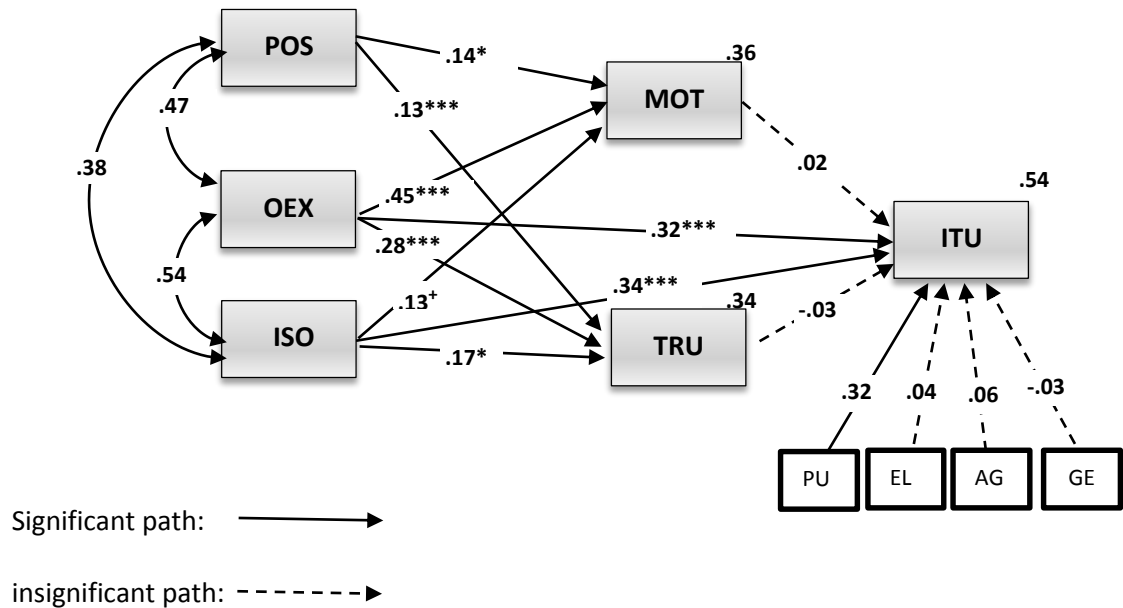


Figure 5-12: Structural Model with hypotheses test results depicted on paths

Further, to assess the impacts of the study controls on the obtained structural model, the researcher removed all controls from the model and ran the model in AMOS. It was clear from the results obtained that the structural paths and the R squared did not change significantly (.54 with the controls included in the model, and .52 with the controls removed). In addition, after removing the controls, the GOF metrics also showed adequate fit ($cmin/df = 1.662$, $CFI = .996$, $RMSA = .041$, $PCLOSE = .571$, $SRMR = .0179$). Further, the P values of both models (with and without controls) were almost unchanged as shown in Table 5-12, confirming that the variance in the DV is mainly explained by the IV.

Table 5-12: Hypotheses testing with and without controls.

Hn	IV	Path	DV	Model With Controls		Model Without Controls	
				P value	Hypothesis Supported? Y/N	P value	Hypothesis Supported? Y/N
H1	POS	→	MOT	.034*	Y	.035*	Y
H2	POS	→	TRU	***	Y	***	Y
H3	OEX	→	MOT	***	Y	***	Y
H4	OEX	→	TRU	***	Y	***	Y
H5	ISO	→	MOT	.065+	Y	.082+	Y
H6	ISO	→	TRU	.016*	Y	.018*	Y
H7	MOT	→	ITU	.682	N	.731	N
H8	TRU	→	ITU	.596	N	.355	N
H9	OEX	→	ITU	***	Y	***	Y
H10	ISO	→	ITU	***	Y	***	Y

Note: *** p<.001; ** p<.01; * p<.05; + p<.10

5.9 Chapter Summary

This chapter began with an explanation of the hypothetico-deductive quantitative process followed in this phase of the project. The theoretical research model proposed was described with details about the various study constructs, the study hypotheses, and the controls used in the model. The instrument used for data collection was then described together with details about its validity and reliability. The descriptive statistics of the sample used in the study to collect data was provided. The chapter also explained the statistical tests and procedures followed during both the dataset screening and the subsequent SEM analysis.

Finally, the chapter concluded by presenting the SEM model used to examine the relationships between the study's constructs. In addition, the results of the hypotheses testing were presented, revealing whether the hypotheses proposed in this study were supported or rejected.

The next chapter discusses the implications, for researchers and practitioners, of the results presented in this chapter.

6 CHAPTER SIX: DISCUSSION AND CONCLUSIONS

6.1 Introduction

The aim of this study was to enhance knowledge of e-government adoption and to propose a theoretical model that further explains the factors that influence end-users' acceptance of e-government.

Chapter Five of this study presented the quantitative phase results where the proposed theoretical model was tested using SEM. This chapter begins by revisiting the research questions and discussing how the research methodology used in this study contributed to finding an answer for each of the study questions. In addition, the chapter provides further discussion of the results presented in Chapter Five by discussing the role played by each of the constructs in predicting end-users' intention to use online government systems. Further, the chapter presents the practical and theoretical contribution that this study makes and its implications for e-government adoption literature and for e-government researchers and practitioners who wish to promote the adoption of e-government services in the UAE and beyond. Finally, the chapter discusses the limitations of the current study and provides direction for future research opportunities that have emerged from the findings of this study.

6.2 Revisiting the Research Questions

As mentioned in Chapter Three, Section 3.2, the aim of this study is to better understand the factors that influence end-users' adoption of e-government services in Abu Dhabi. One of the objectives of this study was to propose a theoretical model that explains the factors that influence end-users' acceptance of e-government. This section describes what has been done to address each of the four research questions listed in Chapter Three, section 3.4. For ease of reading, the research questions are repeated here prior to discussing what has been done to address them.

6.2.1 RQ1: What are end-users' perceptions of electronic interaction with government agencies?

The statistical analysis provided in Chapter Five, Section 5.3.3 and the insights gained from the interview data analysis presented in Chapter Four provide an answer to this research question. The vast amount of data collected during the qualitative interviews showed that the participants have different opinions about interacting with government agencies using online government services.

It was apparent, from the qualitative phase results, that the views of the participants were divergent when it came to their intention to use online government systems. Some participants had positive views; others had negative views, while others were still somewhat ambivalent. Hence, the perceptions of the interview participants' fall into three main categories: first the *pessimists*, the members of this group perceive online government services as risky; and they perceive online services not to be trustworthy. The feelings of this last group are illustrated by the following statements provided by interview participants:

“people tell you that all these things are safe but they are not really as safe as they claim!” ... “I don't trust them [online systems] because when there is a problem you've nowhere to go” (Jamal)

“I would prefer to go face to face and do it there. [Because] I have heard about lots of crimes online.” (Mai)

In addition, members of this group stated that online services are inaccessible to them due to lack of experience, know-how or lack of accessibility to tools needed to use online services.

The second group, the *optimists*, perceive online government services to be very safe to use, that services are accessible to them, and that online services are useful and trustworthy. These sentiments are illustrated by the following participants' comments:

“Because the online service belongs to the government and the government has to maintain its reputation and we trust them. It is impossible that they [the

government] will put a website unless they are sure the website is okay, they will make sure it is secure.” (Sara)

“I don’t want to go around and go to the places, find parking and stay on the line, I prefer online.” (Naomi)

Members of this group are generally well-educated and use the internet on a regular basis. Also, they commented that a number of their friends and family use online services regularly.

The majority of the interview participants belong to the third group, those who are *in between*. Members of this group have mixed views about online government services. While acknowledging the benefits of online services and generally thinking that the future of online government in Abu Dhabi is bright, they nevertheless are not fully accepting online government services at the moment. This group comprises individuals with various educational levels and different computing background. The views of this group are illustrated by the comments of the following participant.

“Maybe they will not update their system, I might pay and they might say you did not pay. There is no evidence of the payment.” (Amena)

“I think the online services here still in its early days it will be better and better in the future.” (Amena)

These three groups were corroborated by a cluster analysis conducted in the quantitative phase. Section 5.3.3 clearly showed the three different groups: the optimists (36.5%); the pessimists (18.3%) and those in between (45.2%). The cluster analysis revealed that about one third of the sample of Abu Dhabi residents are optimistic about the use of online government services, while only less than one fifth are pessimistic about using online government services. This result would indeed be welcome news to the planners and practitioners of online government services in Abu Dhabi. But the real challenge faced by online government planners and practitioners is to convince the pessimists and those in between to use online government and

convert them to being users of online government services; these groups make up approximately two thirds (63.5%) of the study sample.

6.2.2 RQ2: What makes end-users decide to use or not to use e-government services?

In order to answer this research question, the researcher used the findings of both the qualitative and quantitative phases of this study. As mentioned in Chapter Four, the outcome of the qualitative phase was a domain-relationship model that summarizes the different domains that emerged from the qualitative research phase. The identified domains were then used to formulate the ten hypotheses presented in Chapter Five, Section 5.3.2. Section 5.8.1 of this study presented the results obtained after testing the study hypotheses. The results obtained suggest that the OEX, ISO and PU factors influence end-users adoption decision as shown in Figure 6-1. The figure present below is a cut down figure based on Figure 5-1 that shows only the significant relationships between the IV and the DV.

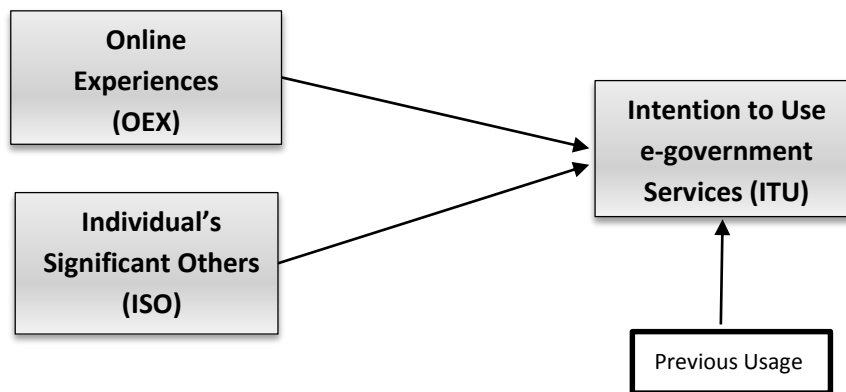


Figure 6-1 Model of the Significant Factors Affecting ITU

The following sections (6.2.2.1 to 6.2.2.5) discuss the results of hypotheses testing in details by focusing on the role of each construct on the SEM model presented in Figure 5-12 rather than on the cut down version presented in.

6.2.2.1 Perceived Online Safety (POS)

The results presented in section 5.8.1 confirm that POS has a positive direct effect on both Motivation (MOV) and Trust (TRU). These results confirm the findings of the qualitative phase, which revealed that participants who are anxious about disclosing sensitive personal details online are generally less motivated to use online systems despite the obvious advantages that online government systems may offer. Conversely, those who are confident that online systems will protect their personal and private information are more likely to be motivated to use online government systems. The positive relationships between the POS and MOT confirmed the sentiments expressed by some of the interview participants who stated that they prefer the inconvenience of visiting a government office in person to taking the risk of compromising the security and privacy of their information when using online government systems as expressed by this participant:

“Look I think there is a risk involved in anything and everything the level of comfort for me personally is when I see the person face to face knowing that now my information is going through them. Now I am not moving away from e-government services, I would like to promote it. I would say that it is imperative that we all move towards it the reason is that it saves everybody time and I don’t need to go to or speak to anybody to get my stuff done.”

The results show that the POS impact on MOV and TRU mirrors the concerns that online shoppers have when they are considering whether to buy from online merchants or from conventional merchants as highlighted by Miyazaki and Fernandez (2001), Topaloğlu (2012) among others. They found that consumers consider that buying from online stores is more risky than buying in person from conventional stores.

The sentiment shared by this interviewee is also in agreement with the results obtained after testing the second hypothesis, which confirms that POS has a direct positive effect on TRU. His concerns about the privacy and security of his personal information affected his motivation and trust in online government systems. The

opinion of another interviewee is in line with the results obtained after testing this hypothesis. She states that:

“I don’t think they have been using a lot of online government services for a long time, I don’t know how efficient they are I would be very worried about the safety of whatever information I am giving so probably I will not risk it I will go in person regardless of the fact that it might be busy. I don’t have enough trust yet on the online system there, I don’t know how efficient it might be! And if my information like credit card number is safe I am not sure about that.”

The result obtained is consistent with previous e-commerce findings on the relationship between privacy & security and trust (Kerkhof et al., 2010; Yousafzai, Pallister and Foxall 2009; Rifon et al. 2005 and Potts, and Jensen 2005). In addition, the statistically significant relationship between POS and TRU confirms Shareef et al.’s (2011) previous empirical findings, which also indicate that privacy and perceived security have a positive relationship with trust in the e-government context.

6.2.2.2 Online Experiences (OEX)

In addition, the results presented in section 5.8.1 confirm that OEX has a positive and direct relationship with MOT, TRU and ITU as all the paths in the SEM model were positive and statistically significant (.45), (.28) and (.32) respectively. The quantitative results obtained for the OEX construct confirm what the qualitative phase of this study proposed. During the qualitative phase, a number of participants suggested that individuals’ computing experience, their attitude towards computing and their awareness of online government services (which are the principle components of this construct) are critical in shaping their motivation, trust and intention to use these services as summarized by the following participant’s comment:

“...may be it [online government services] is something that if we are well educated about it [online government services] about the merits and if somebody tells me how good they are and how reliable they are; maybe it is something I can consider.” (Jamal)

The results obtained after testing hypothesis 9 confirm the sentiments expressed by the above-mentioned interviewee. The results obtained confirm that OEX is one of the strong predictors of individuals' intention to use online government services, as this was evident in the positive, statistically significant path between OEX and ITU in the SEM model shown in Figure 5-12. In addition, the positive and statistically significant path between OEX and MOT in the SEM model supports what Bandura (1986); Gist (1989) and Kim and Kim (2005) suggested that self-efficacy influences individuals' motivation to use online services.

Further, the positive, direct and statistically significant relationship between OEX and TRU further confirms the proposition put forward by the qualitative phase results in this study indicating that individuals' online experiences have a positive direct relationship on trust. During the qualitative phase of this study, it was noticed that individuals with high computing self-efficacy and a positive attitude towards computing, and who are aware of the various online government services on offer, have more trust in online government systems. On the other hand, the level of trust diminishes when individuals encounter negative experiences online, as described in section (4.4.2.4). The quantitative phase results related to this construct confirmed this proposition.

In addition, the results obtained after testing the hypotheses related to this construct revealed that there are similarities between the reviewed e-commerce literature and the results obtained in this study concerning the impact of end-users' prior experience on trust. The reviewed e-commerce literature suggested that end-users' prior experience has a significant impact on individuals' trust in online transaction (Gefen, 2002; Corbitt, Thanasankit and Yi, 2003). The results obtained after testing H4 are similar: the path between OEX and TRU was statistically significant (.28), confirming that end-users' online experience, including prior experience with the system, has a positive impact on trust in government systems.

This study reveals that an individual's attitude towards computing (in addition to his/her awareness of online government systems and his/her computing experiences) affect his/her intention to use online government systems. This was evident in the positive direct relationship between OEX and ITU (.32).

6.2.2.3 Individual's Significant Others (ISO)

The results presented in section 5.8.1 show that ISO has a positive and direct relationship with MOT, TRU and ITU as all the paths in the SEM model presented in Figure 5-12 were positive and statistically significant (.13), (.17) and (.34) consecutively. It is clear from the results obtained that an individual's significant others (such as friends, family acquaintance ...etc.) shape his/her motivation, trust and intention to use online government services.

The results obtained during the quantitative phase of this study further confirm the proposition put forward by the qualitative phase participants. During the qualitative phase, many interviewees mentioned that they rely on their significant others for advice and reassurance about their online behavior (See Chapter Four, Section 4.4.2.2.3). This sentiment is evident in the following participant's comment:

"I haven't heard my friends complain about it [an online government service]. I am not sure what you can accomplish online when it comes to the traffic department, can you pay your tickets online? I am not quite sure, can you get your license online? I don't know if you can do a lot of things online. My friend told me she tried to pay her fines online and it was very hard to use." (Diana)

In addition, the results of the qualitative phase indicated a relationship between the individual's significant others and his/her motivation to use online government systems. Many participants stated that their friends and family play an important role in motivating them to use online government systems. The results obtained during the quantitative phase of this study agree with Mikelaf et al.'s (2013) contention that individuals' motivation to use online e-commerce is affected by the social connections of an individual.

During the qualitative phase of this study, a number of the interviewees indicated that their social surroundings (friends and family) influence their trust in online services and ultimately affect their decision to use these services (section 4.4.2.2.3). The statistically significant relationship between ISO and TRU (.17) confirms that indeed trust is a function of an individual's significant others. This finding is in agreement with both the qualitative phase findings which proposed that the social surroundings of an individual influence their trust in online services, as and the findings of prior studies that associated social influence with individuals' willingness to trust online systems by providing personal information online (Bhattacharjee, 2000; Hwang, 2005; Limayem et al., 2000).

The results obtained in Chapter Five confirmed that the advice, information and support given by friends and family members as well as positive others' previous experiences with online government services encourage a potential adopter to use online government services. The positive direct and statistically significant path between ISO and ITU (.32) supports this notion. This finding also supports Robert Cialdini's argument that when an individual is not sure about something s/he tends to look at what everyone else is doing (especially significant others) for a clue. The statistically significant path between ISO and ITU suggests that an individual's intention to use online government services can be predicted by his or her significant other's status quo. This result is also in line with a number of established technology adoption theoretical frameworks which suggest that an individual's social context affects his/her intention to accept an innovation (Rogers, 1995; (Venkatesh and Davis, 2000; Venkatesh et al., 2003). The results also confirm the findings of Al Awadhi and Morris' (2008) contention that social influence determines an individual's intention to use e-government systems.

6.2.2.4 Motivations (MOT)

As mentioned in Chapter Four, Section (4.4.2.2.4), a considerable number of this study's interviewees during the qualitative phase of the study indicated that they are

motivated to use online government services because it saves them time and money and using the services is more convenient than using conventional face-to-face services as highlighted by the following interviewee's comments:

“e-government saves everybody's time, I don't need to go to or speak to anybody to get my stuff done” (Ali)

In addition, and as mentioned in Chapter Five, Section 5.3.1, a number of technology adoption studies (Carter and Bélanger (2005), Collier and Bienstock (2006), Shareef et al. (2007), Al Awadhi (2008), Sahu & Gupta (2007), and Hu et al. (2009) and Ratten (2015)) included the benefits obtained by individuals from using online systems as a motivational factor that influence their adoption. Therefore, the researcher hypothesized that motivation has a direct and positive effect on Intention to Use e-gov Services.

The results of the quantitative phase described in section 5.8 reveal that the path between MOT and ITU was not statistically significant (.02); therefore this hypothesis was rejected (i.e. motivation does not have a direct positive relationship with intention to use online government services). This finding is interesting because it was not expected as both the qualitative phase and the previous literature reviewed suggested a positive relationship between MOT and ITU; instead, the results obtained suggest that motivation is not a key factor in predicting end-users' acceptance of e-government services. The results obtained are not in agreement with the findings of Griffin et al. (2011). In their study, they found that potential time saving, cost savings, and avoidance of interaction were the relative benefits that determine citizens' attitudes towards the use of the Web as a platform for the delivery of public services in the UK. A possible explanation for the inconsistency in the findings of the two studies may be the context in which the studies took place, since the UK and the UAE are arguably different contexts.

The finding related to this construct also provides a new perspective on the role of motivation in technology adoption that is different from a number of well-established

technology adoption theoretical models. The concept of Motivation has featured in a number of established technology adoption models such as DOI where the perceived relative advantages of an innovation have been recognized as one of the factors that determines potential adopter's perception of an innovation (Rogers, 1995). In the UTAUT, Performance Expectancy and Efforts Expectancy were presented as factors motivating users to adopt a new technology, and TAM presented Perceived Ease of Use as a key adoption factor. While the findings of a single study do not provide conclusive evidence about the role of motivation in technology adoption, the results provide new perspectives on the role of motivation in technology adoption, particularly in the context of online government services adoption.

6.2.2.5 Trust (TRU)

The results regarding this construct, presented in Chapter Five, Section 5.8, revealed that the path between TRU and ITU is statistically insignificant (.03). The results obtained were somewhat surprising as a number of the interview participants mentioned that online trust is a factor that affects their intention to use online government services; moreover, several e-government studies found trust to be a significant factor in predicting users' intention to use online government services.

As mentioned in section 5.3.1.3, a number of interviewees indicated that their level of trust in government employees, government systems and in government itself (the principle components of trust) affect their intention to use online government services as shown in the comment of the following interview participant:

“The technology when I was at their offices was not working well ... so I am a little bit doubtful if it is going to work online if it is not worst.” (Diana)

In addition, the results obtained after empirically testing the hypothesis related to this construct arrived at a different outcome than the outcomes reached by a number of previous e-government related studies. Previous e-government adoption studies suggested that trust is an e-government adoption factor (Gilbert, Balestrini and

Littleboy (2004), Rehman et al. (2012), Kunstelj et al. (2007), Lassnig and Markus (2003) and Shareef et al. (2011)).

However, the results obtained (showing trust as a statistically insignificant factor affecting individuals' intention to use online government) echo the findings of Horst et al. (2005). In their study, which investigated the perceived usefulness, personal experiences, risk perception and trust as determinants of adoption of e-government services in the Netherlands, they found that trust is a determinant of perceived usefulness of e-government services and not end-users' intention to use the services in that country. In addition, the results obtained in this study are consistent with the findings of Teo, Srivastava, and Ji (2008) who investigated the role of trust in electronic government success. They did not find a direct path between trust in government and intention to continue using government websites in their model; instead, they found that trust in government (but not trust in technology) has a significant effect on website users' intention to continue to use government websites.

The discussion presented above shows that there is lack of agreement among scholars regarding the role that trust plays in end-users' adoption of online services. The findings presented in Chapter Five of this study, and after empirically testing the role that trust plays in predicting end-users' acceptance of e-government and its relationship to the other constructs presented in the theoretical framework shown in section (5.3), provide new insights into the role of trust in user intentions to use online services. The researcher agrees with the sentiment expressed by Akkaya, Wolf and Krčmar (2010) who stated that the issue of trust and its influence on the willingness of citizens to use online public services has not been examined thoroughly. While this study provides fresh perspectives of trust in e-government context, indeed trust is a multi-faceted concept and so far only part of it has been uncovered; therefore, to fully understand the role of trust in the e-government context, further investigation in this area is required.

6.2.3 RQ3: What are the relationships between the factors affecting e-government adoption?

The answer to this question was derived from the SEM results presented in Chapter Five, Section 5.4, where the results obtained after testing the study hypotheses using SEM (while controlling for Gender, Education Level, Age Group and Previous Usage) are presented.

The results obtained show that POS positively affects both MOT and TRU. In other words, individuals who perceive online government systems to be safe are both motivated to use these services and trust the services. Similarly, the results show that individuals who are confident users of computers, and are surrounded by a network of significant others who share with them positive online experiences, are more motivated and trusting of online government services.

In addition, the SEM results show that unlike ISO and OEX, MOT and TRU do not have a significant effect on end-users' intention to use online-government services. As indicated in the previous section of this chapter, this result was somewhat surprising, especially for the TRU factor: both the qualitative results and the factor analysis results presented in section (5.3.3) show that, for at least some of this study's participants, trust and motivation are significant factors in determining end-users' intention to use online government services.

The results presented in section 5.4.1 also indicate that individuals who have tried online government services in the past are likely to intend to use them in the future. The results obtained from the SEM analysis show a significant path between the PU (one of the SEM controls) and the DV (ITU) with a significant P value that has an estimate of (0.32). This finding is consistent with the findings of a recent study conducted by Hsiao, Chang and Tang (2016) that investigated the factors influencing continuance usage of mobile social apps. Hsiao et al. found that one of the key factors that explains the continuance usage of social Apps was customer's satisfaction and their habitual use. Although in the current study the participants were not specifically

asked about whether their previous usage of e-government services was habitual or not, it was clear from the results obtained that PU has a positive direct effect on ITU.

Looking at this result at a face value, it would be good news for e-government promoters; however, the researcher asserts that more research is needed to fully understand the impact of PU on ITU for two main reasons. First, as discussed in Chapter Five, Section 5.4.1, when the researcher tested the performance of the SEM model in the absence of this construct there was no significant difference in the R square value (.54 before and .52 after removing the control). The minor difference between the R square before and after removing the controls, including the PU, indicates that other factors presented in the model such as OEX and ISO have far more explanatory power than PU. Second, the focus of this study from the beginning was to understand the factors that influence end-users' intention to use online government services. Post-adoption decisions such as continuous usage or rejection after initial adoption is outside the scope of this study. Nevertheless, this finding could serve as a starting point for future research that focuses on testing the impact of PU on intention to use online government services for both pre- and post-adoption.

6.2.4 RQ4: What are the similarities and/or differences between the factors influencing UAE nationals and expats adoption of e-government services?

As described in Chapter Two of this study, UAE nationals comprise around 20 percent of the total population of the UAE with the majority of UAE inhabitants being expatriates. Hence, one of the objectives of this study was to determine whether there is any difference in the factors that influence the adoption of e-government adoption between the two groups.

The results obtained after completing the qualitative phase of this study did not indicate that the views of participants of the UAE nationals are different from those shared by expats living in the UAE. Further, the researcher analyzed the survey data collected during the quantitative phase of this study to detect any significant difference

in responses to the survey question among members those two distinct groups. As part of the SEM model invariance test described in Chapter Five, Section 5.3.4.4, the researcher compared the performance of the SEM model by grouping the data into two groups Expats vs. UAE nationals. The results obtained indicated that no statically significant difference in the model performance was observed which suggests that there is no significant difference between the two groups.

Based on the results obtained during both the qualitative and quantitative phases of this study, the researcher can conclude that the factors that influence end-users' adoption of e-government services in Abu Dhabi are similar for both the UAE nationals and the expat community.

6.3 The Study Contributions and Recommendations

This study is significant because of the contributions that its findings make to both theory and practice domains, both of which will be discussed in this section.

6.3.1 Methodological and Empirical Contribution

This research contributes to the extant e-government adoption literature by providing new insights into the end-users' perceptions of e-services, particularly from the e-government demand-side. Indeed, developing a better understanding of the factors that influence end-users' demand for online government services leads to higher adoption rates of these services.

Although a number of previous studies looked at the factors that influence users' uptake of technology in general, there have not been many empirical studies where the factors that influence end-users' uptake of e-services particularly in Abu Dhabi were investigated. As described in the previous section in this chapter, this study addresses this shortcoming by providing new insights regarding the factors that influence the uptake of e-government services by end-users.

The factors presented in section 6.2 emerged from a sample of Abu Dhabi residents using a rigorous qualitative approach technique (Domain Analysis) followed by an empirical study that confirmed these factors and tested the relationship between them using the SEM statistical technique described in Chapter Five of this study. Hence, this study contributes a “grassroots” theoretical model that was built and empirically tested with the e-government context in mind.

As discussed in Chapter Two of this study, the UTAUT is one of the most highly recognized technology acceptance models in recent years. The application of this model to explain users’ intentions towards e-government services in a Middle-Eastern context has not produced unequivocal results: Al-Shafi et al. (2009) concluded that when they applied the UTAUT model in Qatar, the model was able to explain only 14.3 percent of the variance. In contrast, the model presented in this study (Demand-based e-government Adoption Model (DeAM)) appears to have more explanatory power than UTAUT, as DeAM explained 54 percent of the variance.

Another theoretical contribution made by this study is the finding that Trust is not a significant adoption factor in e-government context. The e-government adoption literature reviewed in Chapter Two of this study showed that trust has been found to be a factor in some studies while not in others. While the findings of this study do not settle this debate, they provide more insights about trust as a factor. The findings of the qualitative phase indicate that, for some participants, trust influences the adoption of online government services. In addition, the cluster analysis conducted during the quantitative phase revealed considerable variation in the level of trust. However, the results obtained after performing the SEM indicated that the relationship between TRU and ITU constructs was not statistically significant, indicating the lack of causal relationship between these two variables.

While results obtained regarding trust during the first phase of this study and the results obtained after the cluster analysis during the quantitative phase added to the existing e-government adoption literature by highlighting different elements of trust

(such as trust in government employees, trust in government systems and trust in government itself). The insignificant results found after performing the SEM analysis suggest that more research in this area is required to fully understand the role of trust in individuals' acceptance of online government services. One of the possible reasons behind such an insignificant result could be the very 'stringent' requirements of the SEM techniques. Although the sample size used to assess the theoretical e-government adoption models presented in Chapter Five (Figure 5-1) was quite adequate, the researcher recommends the model to be tested using a bigger sample size to determine the relationship between trust and intention to use online government services.

Another contribution that this study makes in terms of study design is the use of cluster analysis technique described in Chapter Five, Section 5.3.3 as part of the mixed research method used in this study. Although the use of the cluster analysis technique as part of study is not new where disciplines such as marketing has been using this technique for a number of years; however, the researcher noticed that only a limited number of IS studies utilize this powerful statistical technique. Using this technique in this study was very useful because it provided the researcher with statistical evidence to support the observations found during the qualitative phase of this study. In addition, cluster analysis gave the researcher a powerful tool to visually present the different end-user profiles in forms of three distinct clusters as described in section (5.3.3). Hence, the researcher recommends the use of this technique more often in future IS research.

6.3.2 Theoretical and Practical Contributions

This project attempted to address the gap in e-government adoption literature (from the demand-side) by contributing a tested and validated theoretical model that summarizes the factors that influence end-users' uptake of e-services. The theoretical model proposed in Chapter Four of this study has been empirically tested and validated in Chapter Five. The model of the factors that influence e-government

adoption by end-users resulted from this study contributes to the hitherto scant demand-side e-government adoption literature and, moreover, has practical implications. The resultant model enables e-government practitioners to better plan, design, develop, implement and manage e-services projects that best meet the needs of end-users.

The results presented in Chapters Four, Chapter Five and in the earlier sections of this chapter, clearly show that online safety is a key issue for end-users. Thus, e-government practitioners and promoters need to send a clear message to potential adopters of e-government services demonstrating and convincing them that the services they offer are safe to use. The results also show that this message is best communicated to the potential adopters through their significant others. Educating the public about the security measures and techniques that online government services use in the UAE, particularly through individuals' significant others, is likely to result in more people accepting and using the online services offered, thereby achieving one of the major goals of e-government initiatives.

Further, the results obtained from the qualitative and quantitative phases of this study show that individuals with adequate online experience are more likely to accept online government services. Hence, e-government managers and practitioners need to consider providing end-users with opportunities to trial (Rogers, 1995) e-government services. Such opportunities will not only allow individuals to try online services but it will also help to raise awareness about the existence of the services. These trialling opportunities are likely to increase individuals' online experiences, leading to greater acceptance of online government services.

In addition, some of the study participants indicated that one of the reasons for their reluctance to use e-government services is their perception that these services are not well attended by government employees in comparison with their face-to-face counterparts. In addition, a number of the study participants believe that it is more advantageous to conduct transactions face-to-face than using an online government

service. To address these concerns, it is recommended that managers and promoters of e-government initiatives make a more concerted effort to inform Abu Dhabi citizens and residents that the online government services are part of a complete process, assuring them that transactions completed online secure the same level of attention as do face-to-face transactions. While these measures will not completely eliminate end-users' misconceptions and misgivings about online government services, as some people will always prefer to conduct transactions face-to-face regardless of the benefits derived from using online government services, such proactive measures will help to increase the number of individuals adopting online government services in Abu Dhabi.

As described in section 4.4.4.1.2, the first sub domain of the OEX domain refers to individuals' computing experience (accessibility, skill level, confidence, the frequency of using computers, etc.). The results obtained from the interviews as well as the results obtained after performing the cluster analysis (Section 5.3.3) and the SEM (section 5.4) of this study show that individuals who possess strong OEX are more likely to use e-government. Therefore, it is recommended that managers and promoters of e-government initiatives provide informal ICT education and training that target individuals with minimal to no ICT skills. There is much in the technology adoption literature indicating that a socially inclusive approach is required to promote the use of technology for social development (Warschauer, 2001). This approach stresses the importance of providing human resources to foster literacy and education as one of the major preconditions for the effective use of ICTs for social development. The qualitative phase of this study reveals that some communities within Abu Dhabi, particularly those who work in labour jobs and have minimal formal education, are a potentially vulnerable group that face the risk of being digitally excluded from fully participating in the UAE digitally-enabled society. An ongoing, informal and informational training program targeting these groups should be developed to promote the use of online government systems as a viable, more convenient and

equally effective way to interact with government in Abu Dhabi. It is important that this approach be relaxed and informal.

6.4 Limitations and Future Research

6.4.1 Study Limitations

While this study yielded valuable insights regarding end-users' perceptions of e-government services as well as the factors that influence their adoption or non-adoption of these services, it does, however, have certain limitations. The first limitation that the study reports in terms of findings is related to the geographical location in which the study took place. The study took place in a Middle Eastern context which has cultural assumptions that are arguably different from those of a western country (i.e. users in other countries may not resemble those of this study's population). Therefore, it is uncertain that the findings of this study will be the same for different geographic locations that have different cultural assumptions. This limitation provides IS researchers with opportunities for future research where the theoretical e-government adoption model put forward in this study can be tested in different contexts to compare the performance of the model across different geographical locations that have diverse cultural assumptions.

As mentioned in Chapter Three, Section 3.5.2, the first phase of this study used semi-structured interviews to collect qualitative data from the study participants. Another possible limitation is therefore that of interviewer bias identified by (Robson, 2002), who suggested that unless strategies are in place to counter this, the reliability of the interpretation is in question. To address this potential limitation, the researcher adopted a number of strategies: first, a semi-structured interviewing approach was used during the qualitative data collection phase of the project. Mitchell and Jolley (2007) argue that this approach reduces the likelihood of interviewer bias during the process of qualitative data collection.

Second, as noted in section 4.2, the researcher conducted two rounds of interviews with each participant. The interview transcripts were returned to the participants after the first interview for verification purposes which strengthens the reliability of the results. The participants were invited to read the transcripts and discuss any changes they wished to make. Returning the transcripts served a number of purposes: it ensured that the information provided by the participants was verified as authentic, reliable and accurate and represented what the interviewee intended; moreover, the interviewees were empowered to become more than just passive respondents as they were given the opportunity to expand upon and discuss the statements made during the first interview.

The third strategy used was the use of Domain Analysis, a robust qualitative data analysis technique, described in section 4.3. This approach ensures that the researcher's interpretation of the qualitative data is well documented and supported by the interviewees' statements. Therefore, the Domain Analysis technique ensures that the conclusions reached are based on evidence collected from the participants while simultaneously mitigating the possibility of bias.

The fourth strategy used to ensure the accuracy of the results obtained was the use of data collected from various sources (i.e. different potential e-government services user groups) at different dates, times and spaces, using both qualitative and quantitative data to obtain the study results. The results from the cross-section survey conducted during the second phase of this study were used to validate the qualitative phase results, thereby ensuring that any possible researcher bias was controlled.

6.4.2 Direction for Future Research

This study examined a cross-section of participants from Abu Dhabi including participants with different e-government usage backgrounds (non-users to experienced users). While it was necessary to include end-users with different backgrounds to answer the set research questions, future studies could examine more

specific subsets of users (e.g. non-users vs. regular users of e-government services) and contexts (e.g. intention to uses vs. continuance usage or western-nations vs. non-western nations) in order to identify constraints and exceptions with respect to usage behaviour. It would also be beneficial to perform longitudinal studies that test the proposed theoretical model in different countries or locations to address the geographical limitation of the proposed theoretical model as discussed in the limitations section (6.4.1). The researcher acknowledges that such studies would require a significant budget and could be an expensive project; however, given the potential savings to be made from efficiency gains if e-government is widely adopted, it might be money well spent. Future DeAM-based studies could also test the effects of moderators, such as habitual usage of e-government services, e-government services quality, an individual's educational background and satisfaction with online services, etc. on the model.

Building on the findings of this study pertaining to trust, future studies could also investigate the impact of trust on users' intention to use or to continue to use online government services. Future studies could investigate the role of the various components of trust (such as trust in e-government systems, trust in government and trust in people, etc.) in shaping end-users' perceptions of e-government services as well as the role of trust in determining users' intention to use the services.

6.5 Summary

The aim of this research project was to enhance knowledge of e-government adoption and to propose a theoretical model that further explains the factors that influence end-users' acceptance of e-government. Specifically, this study investigated the use of e-government services by end-users in Abu Dhabi.

To achieve the objective of this study, a two-phase, sequential mixed methods research approach was used. During the first phase of the study, the researcher conducted a qualitative study in which sixteen semi-structured qualitative interviews were

undertaken. The data collected from the interviews participants enabled the researcher to develop a richer understanding of the factors that influence end-users' use (or lack of use) of e-government services in Abu Dhabi. The researcher conducted two rounds of semi-structured interviews with each participant. The use of two rounds of interviews enabled the researcher to form strong rapport with the interviewees which helped to obtain valuable insights from them.

The qualitative data collected during the first phase of the study enabled the researcher to generate the theoretical framework that guided the formulation of hypothesis grounded in both literature and the participants' opinions. During the second phase of the study, the researcher collected and analyzed data from a sample of Abu Dhabi residents using quantitative data collection and data analysis techniques to test the hypothesis developed during the qualitative phase of the study.

The rigour of this phase was established by ensuring that the survey instrument designed and used for the collection of the quantitative data was valid and reliable; used a representative sample that drew participants from various sectors of the Abu Dhabi population; and used SEM procedures to perform various statistical analysis tests, including EFA and CFA, in order to arrive at the study's conclusions.

In addition, cluster analysis techniques were used during this phase which also contributed to the rigour of the quantitative phase and indeed to the overall rigour of the study.

In conclusion, this study used a rigorous mixed method research approach to contribute new insights regarding the factors that influence end-users' acceptance of e-government. The findings of this study have significant implications for technology adoption researchers in general and in particular for e-government adoption researchers and practitioners who seek to promote the uptake of government services by end-users in Abu Dhabi and beyond.

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Appendices

A - 1. Ethical Approval for the Qualitative Phase

	
Memorandum	
To	Eltahir Kabbar, School of Information Systems
From	Francesca Vallini
Subject	Protocol Approval IS_10_15
Date	20 October 2010
Copy	Dr Peter Dell, School of Information Systems

School of Information Systems

Telephone 9266 7027
Facsimile 9266 7348
Email F.Vallini@curtin.edu.au

Dear Eltahir

Thank you for your "Form C Application for Approval of Research with Low Risk (Ethical Requirements)" for the project titled "Modelling end-user adoption of E-government services in the Abu Dhabi". On behalf of the Human Research Ethics Committee, I am authorised to inform you that the project is approved.

Approval of this project is for a period of twelve months **07.10.2010 to 07.10.2011**.

The approval number for your project is **IS_10_15**. Please quote this number in any future correspondence. If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately.

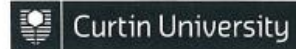


Francesca Vallini
Human Ethics Co-ordinator
School of Information Systems

Please Note: The following standard statement must be included in the information sheet to participants:
This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number «Approval_Number»). If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or hrec@curtin.edu.au

CRICOS Provider Code 00301J

A - 2. Ethical Approval for the Quantitative Phase



Memorandum

To	Eltahir Kabbar, School of Information Systems
From	Francesca Vallini
Subject	Protocol Approval IS_14_06
Date	24 February 2014
Copy	Prof Peter Dell, School of Information Systems

Office of Research and Development
Human Research Ethics Committee
Telephone 9266 2784
Facsimile 9266 3793
Email hrec@curtin.edu.au

Thank you for your "Form C Application for Approval of Research with Low Risk (Ethical Requirements)" for the project titled "*Modelling end-user adoption of E-government services in the Abu Dhabi*". On behalf of the Human Research Ethics Committee, I am authorised to inform you that the project is approved.

Approval of this project is for a period of two years to **24.02.2016**.

Your approval has the following conditions:

- (i) Annual progress reports on the project must be submitted to the Ethics Office.
- (ii) It is your responsibility, as the researcher, to meet the conditions outlined above and to retain the necessary records demonstrating that these have been completed.**

The approval number for your project is **IS_14_06**. Please quote this number in any future correspondence. If at any time during the approval term changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately.

Francesca Vallini
Form C Ethics Co-ordinator
School of Information Systems

Please Note: The following standard statement must be included in the information sheet to participants:
This study has been approved under Curtin University's process for lower-risk Studies (Approval Number xxxx). This process complies with the National Statement on Ethical Conduct in Human Research (Chapter 5.1.7 and Chapters 5.1.18-5.1.21). For further information on this study contact the researchers named above or the Curtin University Human Research Ethics Committee. c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth 6845 or by telephoning 9266 9223 or by emailing hrec@curtin.edu.au.

A - 3. Information Sheet – Qualitative Phase- English



INFORMATION SHEET

Modelling end-user adoption of E-government services in Abu Dhabi

Researchers:

Dr Peter Dell (Supervisor)

Contact: Peter.Dell@cbs.curtin.edu.au

Phone: +61 8 9266 4485

Eltahir Kabbar

Contact: ekabbar@hct.ac.ae

Phone: +971 2 6941 477

I am a PhD student at Curtin University, Perth, Australia. I am undertaking this research project as part of my study program. This project aims to increase our understanding of the factors that influence the use and non-use of e-government services by Abu Dhabi residents.

The main objectives are to:

1. understand end-users' perceptions of electronic interaction with government agencies;
2. examine the factors that influence end-users' use (or lack of use) of e-government services;
3. identify barriers discouraging end-users from using e-government services;
4. develop an e-government adoption model; and
5. empirically test and validate the e-government adoption model.

To gather the information required to meet the research objectives, approximately three rounds of interviews need to be completed. Each interview will take approximately 45 minutes to complete. Interviews will be audio-taped and transcribed by the researchers prior to analysis. The interviewee has the right to request that the audio tape be turned off at any time during the interviews. Tapes and transcriptions will be kept in a secure location in the researchers' workplace, and will be securely disposed of after five years. Participants' real names and details will remain confidential and will not appear in any publications resulting from the research.

The interview transcripts will be analysed and the results will be reported and published both nationally and internationally. A summary of the research findings will be made available to you. Likewise, if you would like further information at any time please contact the researchers.

This project has been approved by Curtin University Human Research Ethics Committee (approval number: IS_10_15) and adhere to the Australian National Statement on Ethical Conduct in Human Research principles and guidelines.

At any time you have the right to:

- Decline to participate
- Decline to answer any particular question
- Withdraw from the study
- Ask any questions about the study at any time during participation
- Provide information on the understanding that your name will not be used unless you give permission to the researcher
- Be given access to a summary of the project findings upon your request

If you agree to participate, please sign the Consent Form attached.

Thank you for your help.

Eltahir Kabbar

PhD Student – School of Information Systems
Curtin University of Technology
Australia

A - 4. Information Sheet - Quantitative Phase - English



Dear Participant,

My name is Eltahir Kabbar. I am a PhD student with Curtin University, Perth, Australia. I am undertaking this academic research as part of my study program. This project aims to increase our understanding of the factors that influence the use and non-use of e-government services in Abu Dhabi.

I am truly seeking your valued participation in completing a confidential research survey that will take about 10 to 15 minutes of your time. Here is the link to the survey:

https://curtin.asia.qualtrics.com/SE/?SID=SV_cC3nk6JFRcojI1f

This study has been approved under Curtin University's process for lower-risk Studies (Approval Number IS_14_06). This process complies with the National Statement on Ethical Conduct in Human Research (Chapter 5.1.7 and Chapters 5.1.18-5.1.21).

For further information on this study, contact the researchers named below or the Curtin University Human Research Ethics Committee. c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth 6845 or by telephoning 9266 9223 or by emailing hrec@curtin.edu.au.

Please be assured that I am NOT conducting this survey/research on behalf of my employer or on behalf of any other institution/individual. I am only conducting this research for academic research purposes. All responses are anonymous, and information collected will be strictly confidential and will be used only for academic research purposes in aggregate form so that no single individual can be identified.

If you have any question, please feel free to contact me at any time either by e-mail at ekabbar@hotmail.com, kabbar@gmail.com. Alternatively, you may contact my supervisor, Professor Peter Dell at P.T.Dell@curtin.edu.au.

Kind Regards,

A handwritten signature in blue ink that reads "Eltahir Kabbar" with a stylized flourish at the end.

PhD Student – School of Information Systems
Curtin University of Technology
Australia

A - 5. Information Sheet – Quantitative Phase – Arabic



عزيزي المشارك،

أولاً اعرّفكم بنفسني، أسمى الطاهر كَبَّار طالب دكتوراه مع جامعة كيرتدين بأستراليا. حالياً أقوم بإجراء بحث الأكاديمية كجزء من برنامج دراستي الجامعية. يهدف هذا البحث إلى زيادة فهمنا للعوامل التي تؤثر على استخدام أو عدم استخدام خدمات الحكومة الإلكترونية في أبو ظبي.

يسعدني حقاً ان استمع الى آرائكم القيمة عن موضوع البحث. لاستكمال استبانة البحث، التي سوف تستغرق حوالي 10 إلى 15 دقيقة من وقتكم، رجا انقر على الرابط التالي:

https://curtin.asia.qualtrics.com/SE/?SID=SV_cC3nk6JFRcojI1f

لقد تم اعتماد هذه الدراسة من قبل جامعة كيرتدين (رقم الاعتماد: اس_14_06) على ان الدراسة متوافقة مع المعايير الوطنية الأسترالية لإجراء البحث العلمي تحت معايير اخلاقية وسلوكية عالية وان هذه الدراسة لا تمثل خطر على المشاركين (الفصل 5.1.7 والفصول 5.1.18-5.1.21).

لمزيد من المعلومات حول هذه الدراسة الرجا الاتصال بالباحثين المذكورين ادناه أو بلجنة اخلاقيات البحوث البشرية جامعة كيرتدين لعناية/ -مكتب البحوث والتنمية، جامعة كيرتدين، صندوق بريد 1987 بيرث 6845 أو بالاتصال على 9223 9266 +61 أو عن طريق البريد الإلكتروني بريد

hrec@curtin.edu.au

أحب ان أؤكد لكم بأنني لا أقوم بإجراء هذا المسح / البحث نيابة عن مكان عملي أو من ينوب عنه او نيابة عن أي مؤسسة / فرد آخر. لقد تم اجرا هذا البحث لأغراض البحث العلمي فقط. جميع الاجابات على هذه الاستبانة سيتم جمعها في سرية تامة وستستخدم فقط لأغراض البحث الأكاديمي في شكل ملخص بحيث لا يمكن ربط اي من الاجابات بشخص معين.

إذا كان لديك أي سؤال، فلا تتردد في الاتصال بي في أي وقت إما عن طريق بريدي الإلكتروني او عن طريق البريد الإلكتروني لمشرفي الأكاديمي كما موضح ادناه.

تقبلوا اطيب تحياتي

جامعة كيرتدين للتكنولوجيا – استراليا – الطاهر كبار – طالب دكتوراه

kabbar@gamil.com او ekabbar@hotmail.com

P.T.Dell@curtin.edu.au

A - 6. Consent Form



Modelling end-user adoption of E-government services in Abu Dhabi

CONSENT FORM

THIS CONSENT FORM WILL BE HELD FOR A PERIOD OF FIVE (5) YEARS

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree/do not agree to the interview being audio taped.

I agree to participate in this study under the conditions set out in the Information Sheet.

Signature:

Date:

Full Name – printed

A - 7. Qualitative Phase - Interview Guide

Date: _____ Place: _____
Start Time: _____ Finish Time: _____

Interview Reminders

Briefly explain the aim of the study, type of questions and interviewee's rights.

Assure the participants that all information collected will be confidential and private.

Hand in the information sheet.

Ask participant to sign the consent form.

According to Spradley (1979), longer questions obtain more responses from interviewees. Start with Grand Tour questions followed by Mini Tour. Both questions and answers must be discovered from informants.

Section 1 (ICT background)

- 1-1 Can you tell me how you started using computers and the Internet? When was that? How hard or easy it was? (effort expectancy, social influence, voluntariness of use, experience)
- 1-2 In a typical day, can you tell me what you use computers for? What about usage of any other communication devices? (Cell phones, PDA, smart phones etc.).
- 1-3 In a typical day, can you tell me what you do online? Where do you access the Internet? How many hours, approx. per week do you spend online?
- 1-4 Could you describe what happened online the last time you used the Internet from the time you started until you finished. Tell me about the websites you visited?
- 1-5 Can you tell me about the last time you interacted with government section?

Section 2 (Understand end-users' perceptions)

- 2-1 What made you decide to use computers and the Internet? What benefits do you get from using computers and the Internet? (Trust, awareness of services, performance expectancy, effort expectancy, social influence, facilitating conditions).
- 2-2 Can you tell me about how you feel about using online government services? Tell me about any recent experience you have (trust, awareness of services, performance expectancy, effort expectancy, social influence, facilitating conditions).
- 2-3 Can you tell me about how you feel about using the Internet to shop online? Tell me about any recent experience you have. (Trust,

awareness of services, performance expectancy, effort expectancy, social influence, facilitating conditions).

- 2-4 In the long-term what do you think computers will enable you to do? (getting a job, getting a better job, saving time, usefulness etc.)

Section 3 (Adopters: Factors influencing the adoption)

- 3-1 Can you tell me how you got into using e-government services? What are the steps or stages you gone through? What benefits do you get from using online government services? (stages of adoption, process followed, advantages, getting a better job, saving time etc)
- 3-2 Can you tell me how you got into using online shopping? What are the steps or stages you went through? What benefits do you get from using online government services? (stages of adoption, process followed, advantages, getting a better job, saving time etc.).
- 3-3 In your views what is missing from online government services? What can be done better? Did you have any concerns/worries/issues when using online services?

Section 4 (Non-adopters: identify barriers)

- 4-1 Do you know if any of your friend/family use e-government services? What do they say about it?
- 4-2 Do you think you will use the Internet to shop online in the future? Under what condition(s), what is stopping you? (Access, trust, not relevant, awareness, cultural compatibility).
- 4-3 Would you like to access government services online? Under what condition(s), what is stopping you? (Access, trust, not relevant, awareness, cultural compatibility).

Section 5 (Personal Information)

Name:

Gender: *M* *F*

Age group: (*<20*) (*20-30*) (*31-40*) (*41-50*) (*50-60*)
(*> 60*)

Educational achievement: *Non* *Secondary school* *High school* *Tertiary*

Ethnicity:

Do you have any questions for me?

Thank you for your time.

A - 8. Quantitative Research Characteristics


- Describing a research problem through a description of trends or a need for an explanation of the relationship among variables.
 - Providing a major role for the literature through suggesting the research questions to be asked and justifying the research problem and creating a need for the direction (purpose statement and research questions or hypotheses) of the study.
 - Creating purpose statements, research questions, and hypotheses that are specific, narrow, measurable, and observable.
 - Collecting numeric data from a large number of people using instruments with preset questions and responses
 - Analyzing trends, comparing groups, or relating variables using statistical analysis, and interpreting results by comparing them with prior predictions and past research
 - Writing the research report using standard, fixed structures and evaluation criteria, and taking an objective, unbiased approach
-

A - 9. Initial Constructs - Measurement Items and their References to literature

Construct & Definition	Measurement Items	References to the lit
Perceived Online Safety		
	<p>I believe online systems are safe to interact with for financial purposes. I am confident that online systems have adequate security features. I am confident that online systems will protect my personal information I am confident that online systems will keep my personal information confidential. I believe that online systems will not share my personal information with others. I worry about who might be able to see information that I enter online systems. I hesitate when I provide confidential personal information online.</p>	<p>Yoo and Donthu (2001), Devaraj et al. (2002), Janda et al. (2002), AGIMO (2003), Murru (2003), Wolfinbarger and Gilly (2003), Chen and Thurmaier (2005), Parasuraman et al. (2005), Wangpipatwong et al. (2005), Collier and Bienstock (2006), Anthopoulos et al. (2007), Kumar et al. (2007), Shareef et al. (2007) Yenisey et al. (2005).</p>
Online Services Ease of Access		
	<p>I am aware of e-Government services in Abu Dhabi. I have seen information promoting online government services in Abu Dhabi. I have heard about online government services in Abu Dhabi through word-of-mouth. I have the skills required to use online government services. I am afraid of making mistakes when I use a computer. I am confident using computers. I have adequate computer technology at home to access online government services. I have adequate computer technology away from home to access online government services. The internet connection I use is costly.</p>	<p>AGIMO (2003), Murru (2003), Anthopoulos et al. (2007), Shareef et al. (2009) Wang (2002), AGIMO (2003), Tung and Rieck (2005), Anthopoulos et al. (2007), Kumar et al. (2007) Murru (2003),</p>
Social Context		
	<p>People who influence me are comfortable using the internet. People who influence me are comfortable using online government services. People who influence me tell me about their negative Internet experiences.</p> <p>People who influence me tell me about their negative experiences with online government systems. People who influence me tell me about their positive Internet experiences. People who influence me tell me about their positive experiences with online government systems. People influence me think that I should use online government services.</p>	<p>Venkatesh et al (2003). AlAwadi and Morris (2008)</p>

Motivation		
	<p>Using online services is cheaper than interacting with government via other means.</p> <p>Using online services is easier than interacting with government via other means.</p> <p>Using online services is faster than interacting with government via other means.</p> <p>Using online services is more convenient than interacting with government via other means.</p>	<p>Yoo and Donthu (2001), Devaraj et al. (2002), Janda et al. (2002), Wang (2002), Wolfenbarger and Gilly (2003), Carter and Bélanger (2005), Chen and Thurmaier (2005), Parasuraman et al. (2005), Tung and Rieck, 2005; Wangpipatwong et al. (2005), Collier and Bienstock (2006), Fassnacht and Koese (2006), Kumar et al. (2007), Shareef et al. (2007). Venkatesh et al. (2003). AlAwadi (2008)</p>
Trust		
	<p>I think government employees know what they are doing.</p> <p>I trust online government systems in Abu Dhabi.</p> <p>I trust online government systems in other countries which I have lived in.</p> <p>I trust government employees in Abu Dhabi.</p> <p>I trust government employees in other countries which I have lived in.</p> <p>I think information provided by online government services can be trusted.</p> <p>I trust that somebody can be held accountable for any problems that occur in my use of online government systems.</p> <p>I think people who manage online government systems are good at their job.</p> <p>I think people who manage online government systems are helpful.</p> <p>I think people who manage online government systems are honest.</p>	<p>Loiacono et al. (2002), Accenture (2003), AGIMO (2003), Murru (2003), Chen and Thurmaier (2005), Parasuraman et al. (2005), Tung and Rieck (2005), Wangpipatwong et al. (2005), Collier and Bienstock (2006), Fassnacht and Koese (2006). AGIMO (2003), Kumar et al. (2007), Shareef et al. (2007), Shareef et al. (2009). Balasubramanian et al. (2003), Collier and Bienstock (2006), Fassnacht and Koese (2006)</p>
Communication Preference		
	<p>I prefer interacting with government online instead of face-to-face.</p> <p>I will only use online government systems if I have no other choice.</p> <p>I will only interact with government face-to-face if I have no choice.</p>	<p>Author self-developed</p>
Intention to Use		
	<p>I have used online government systems in the past.</p> <p>I will use online government systems in the next 3 months.</p> <p>I will use online government systems in the next 12 months.</p>	<p>Venketash et al. (2003); Al Awadhi (2008). Author self-developed</p>

A - 10. Survey Instrument- English Version

	<h1 style="margin: 0;">Curtin University</h1>																						
<p>Dear Participant,</p> <p>Thank you for agreeing to take this survey.</p> <p>If you have any question, please feel free to contact me at any time by e-mail at ekabbar@hotmail.com or kabbar@gmail.com.</p>																							
<p>What is your gender?</p> <p> <input type="radio"/> Male <input type="radio"/> Female </p>																							
<p>What is your age group?</p> <p> <input type="radio"/> 0-14 <input type="radio"/> 15-24 <input type="radio"/> 25-34 <input type="radio"/> 35-44 <input type="radio"/> 45-54 <input type="radio"/> 55-64 <input type="radio"/> More than 65 </p>																							
<p>What is the highest degree or level of education you have completed?</p> <p> <input type="radio"/> None <input type="radio"/> Less than high school <input type="radio"/> High school graduate <input type="radio"/> University degree <input type="radio"/> Post graduate degree </p>																							
<p>What is your current occupation?</p> <p> <input type="radio"/> Professional/technical <input type="radio"/> Clerical <input type="radio"/> Sales <input type="radio"/> Laborer <input type="radio"/> Retired <input type="radio"/> Homemaker <input type="radio"/> Student <input type="radio"/> Unemployed </p> <p> <input type="radio"/> Other <input style="width: 100px; height: 15px;" type="text"/> </p>																							
<p>How long have you been using the Internet? (how many years? e.g. 3)</p> <p><input style="width: 100%; height: 20px;" type="text"/></p>																							
<p>Do you live in Abu Dhabi Emirate?</p> <p> <input type="radio"/> Yes <input type="radio"/> No </p>																							
<p>Are you:</p> <p> <input type="radio"/> UAE National <input type="radio"/> Expatriate </p>																							
<p>To what extent do you agree with the following statements on a scale of 0 to 10?</p>																							
<p>I am confident using computers.</p> <table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="width: 10%;">Totally Disagree (0)</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>Totally Agree (10)</td> </tr> <tr> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> </table>		Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)													
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<p>I am afraid of making mistakes when I use a computer.</p> <table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="width: 10%;">Totally Disagree (0)</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>Totally Agree (10)</td> </tr> <tr> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> </table>		Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)													
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>													

I am aware of online government services in Abu Dhabi.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I have seen information promoting online government services in Abu Dhabi.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I have heard about online government services in Abu Dhabi through word-of-mouth.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I have the skills required to use online government services.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It is easy to learn how to use online government services.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I have adequate computer technology at home to access online government services.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I have adequate computer technology away from home to access online government services.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

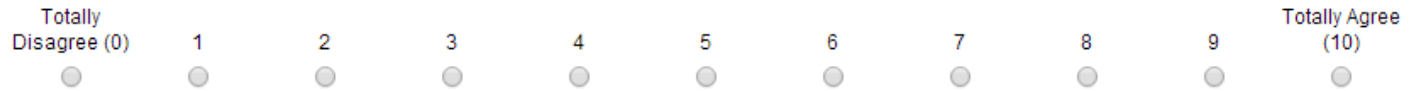
Most of the people I know use social networking services (e.g. Twitter, Facebook, and YouTube).

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

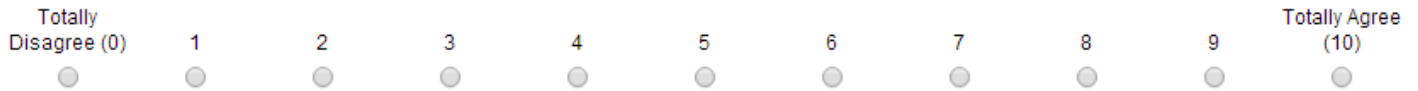
The internet connection I use is costly.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

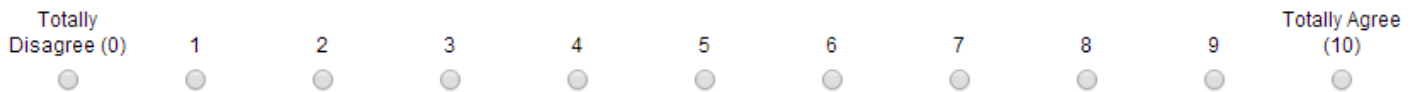
I think using online services is cheaper than interacting with government in other ways.



I think using online services is easier than interacting with government in other ways.



I think using online services is faster than interacting with government in other ways.



I think using online services is more convenient than interacting with government in other ways.



I think that the use of government services online is more flexible than the interaction with the government in other ways



I believe online systems are safe to interact with for financial purposes.



I am confident that online systems will protect my personal information.



I am confident that online systems have adequate security features.



I am confident that online systems will keep my personal information confidential.



I believe that online systems will not share my personal information with others.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry about who might be able to see the personal information that I enter into online systems.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I hesitate when I provide confidential personal information online.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who influence me (e.g. family and friends) are comfortable using the internet.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who influence me (e.g. family and friends) are comfortable using online government services.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who influence me (e.g. family and friends) tell me about their negative Internet experiences.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who influence me (e.g. family and friends) tell me about their negative experiences with online government systems.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who influence me (e.g. family and friends) tell me about their positive Internet experiences										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who influence me (e.g. family and friends) tell me about their positive experiences with online government systems.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who influence me (e.g. family and friends) think that I should use online government services.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It is easy to buy inexpensive computers where I live										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think government employees know what they are doing.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I trust online government systems in Abu Dhabi.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I trust online government systems in other countries in which I have lived.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I trust government employees in other countries in which I have lived.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I trust government employees in Abu Dhabi.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think information provided by online government services can be trusted.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I trust that somebody can be held accountable for any problems that occur in my use of online government systems.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think people who manage online government systems are good at their job.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think people who manage online government systems are helpful.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think people who manage online government systems are honest.										
Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I prefer interacting with Abu Dhabi government online instead of face-to-face.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I will only use Abu Dhabi online government systems if I have no other choice.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I will only interact with Abu Dhabi government face-to-face if I have no choice.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I have used online government systems in the past.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I will use online government systems in the next 3 months.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>


I will use online government systems in the next 12 months.

Totally Disagree (0)	1	2	3	4	5	6	7	8	9	Totally Agree (10)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

This is the end of the Survey!

Thank you for completing this survey. If you have any question, please feel free to contact me at anytime by e-mail at ekabbar@hotmail.com or kabbar@gmail.com.

A - 11. Survey Instrument- Arabic Version

 Curtin University																																		
<p>عزيزي المشارك، شكرا لكم على موافقتكم تكملة هذه الاستبانة. إذا كان لديك أي سؤال، فلا تتردد في الاتصال بي في أي وقت عن طريق البريد الإلكتروني الاتي: ekabbar@hotmail.com او kabbar@gmail.com الطاهر كيار</p>																																		
<p>الجنس</p> <p><input type="radio"/> أنثى <input type="radio"/> ذكر</p>																																		
<p>الفئة العمرية؟</p> <p><input type="radio"/> 0-14 <input type="radio"/> 15-24 <input type="radio"/> 25-34 <input type="radio"/> 35-44 <input type="radio"/> 45-54 <input type="radio"/> 55-64 <input type="radio"/> أكثر من 65</p>																																		
<p>المؤهل العلمي</p> <p><input type="radio"/> غير متعلم <input type="radio"/> المتوسطة <input type="radio"/> الثانوية <input type="radio"/> الجامعية <input type="radio"/> فوق الجامعية</p>																																		
<p>ما هي مهنتك الحالية؟</p> <p><input type="radio"/> محترف / تقني (مثلا: طبيب، محامي، محاسب، مدرس ... الخ) <input type="radio"/> كاتب <input type="radio"/> مبيعات <input type="radio"/> عامل <input type="radio"/> متقاعد <input type="radio"/> ربة منزل <input type="radio"/> طالب <input type="radio"/> عاطل عن العمل <input type="radio"/> مهنة اخرى <input type="text"/></p>																																		
<p>متى بدأت استعمال الإنترنت (اكتب عدد السنوات)؟</p> <p><input type="text"/></p>																																		
<p>هل أنت من سكان أبوظبي؟</p> <p><input type="radio"/> نعم <input type="radio"/> لا</p>																																		
<p>هل أنت:</p> <p><input type="radio"/> إماراتي <input type="radio"/> مقيم</p>																																		
<p>إلى أي مدى تتفق مع العبارات التالية على مقياس من 0-10 (0 لا اوافق تماما، 10 اوافق تماما)؟</p> <p>انا متمكن من استعمال الحاسوب (الكمبيوتر).</p> <table border="0" style="width: 100%; text-align: center;"> <tr> <td>أوافق تماما</td> <td>9</td> <td>8</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>لا أوافق تماما</td> </tr> <tr> <td>(10)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>(0)</td> </tr> <tr> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> </table>		أوافق تماما	9	8	7	6	5	4	3	2	1	لا أوافق تماما	(10)										(0)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أوافق تماما	9	8	7	6	5	4	3	2	1	لا أوافق تماما																								
(10)										(0)																								
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																								
<p>اخاف (اخشى) من اقراراف اخطاء عند استخدام الكمبيوتر</p> <table border="0" style="width: 100%; text-align: center;"> <tr> <td>أوافق تماما</td> <td>9</td> <td>8</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>لا أوافق تماما</td> </tr> <tr> <td>(10)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>(0)</td> </tr> <tr> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> </table>		أوافق تماما	9	8	7	6	5	4	3	2	1	لا أوافق تماما	(10)										(0)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أوافق تماما	9	8	7	6	5	4	3	2	1	لا أوافق تماما																								
(10)										(0)																								
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																								
<p>اعرف (أدرك) معلومات كافيته عن الخدمات الإلكترونية المقدمة من حكومة ابوظبي.</p> <table border="0" style="width: 100%; text-align: center;"> <tr> <td>أوافق تماما</td> <td>9</td> <td>8</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>لا أوافق تماما</td> </tr> <tr> <td>(10)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>(0)</td> </tr> <tr> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> </table>		أوافق تماما	9	8	7	6	5	4	3	2	1	لا أوافق تماما	(10)										(0)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أوافق تماما	9	8	7	6	5	4	3	2	1	لا أوافق تماما																								
(10)										(0)																								
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																								

لقد رأيت بعض المعلومات الترويجية عن الحكومة الإلكترونية في أبو ظبي.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
لقد سمعت من بعض الناس عن خدمات الحكومة الإلكترونية في أبو ظبي.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
لدي المهارات المطلوبة لاستخدام الخدمات الحكومية المقدمة عبر الإنترنت.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
من السهل على تعلم كيفية استخدام الخدمات الحكومية عبر الإنترنت.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
لدى الأدوات التكنولوجية الضرورية (مثل الكمبيوتر، خدمة الانترنت ... الخ) للاتصال بالخدمات الحكومية الكترونياً من البيت.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
لدى الأدوات التكنولوجية الضرورية (مثل الكمبيوتر، خدمة الانترنت ... الخ) للاتصال بالخدمات الحكومية الكترونياً من خارج البيت.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
معظم الناس الذين أعرفهم يستخدمون خدمات الشبكات الاجتماعية (مثل تويتر، الفيس بوك، ويوتيوب).										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
خدمة الإنترنت التي استخدمها عالية السعر (مكلفة).										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
اعتقد ان استخدام خدمات الحكومة الإلكترونية أرخص من التفاعل مع الحكومة بطرق أخرى.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
اعتقد ان استخدام خدمات الحكومة الإلكترونية أسهل من التفاعل مع الحكومة بطرق أخرى.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

اعتقد ان استخدام خدمات الحكومة الإلكترونية أسرع من التفاعل مع الحكومة بطرق أخرى.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
اعتقد ان استخدام خدمات الحكومة الإلكترونية يحتاج لجهد اقل من التفاعل مع الحكومة بطرق أخرى.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أعتقد ان استخدام الخدمات الحكومية على الانترنت هو أكثر مرونة من التفاعل مع الحكومة بطرق أخرى.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
اعتقد بان استخدام الانترنت لإجراء المعاملات المالية آمن.										
Totally Agree (10)	9	8	7	6	5	4	3	2	1	Totally (Disagree (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
لدى ثقة في أن الخدمات الإلكترونية ستقوم بحماية معلوماتي الشخصية.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
لدى ثقة في أن الخدمات الإلكترونية توفر الحماية التقنية المطلوبة.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
لدى ثقة في أن الخدمات الإلكترونية سوف تحفظ معلوماتي الخاصة في سرية تامة.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
لدى ثقة في أن الخدمات الإلكترونية سوف لن تعطي معلوماتي الشخصية لأي جهة أخرى.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أخشى من إمكانية ان يطلع شخصاً ما على معلوماتي الشخصية عندما ادخلها في موقع ما على الانترنت.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
اتردد عندما أدخل معلوماتي الشخصية في موقع ما على الانترنت.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

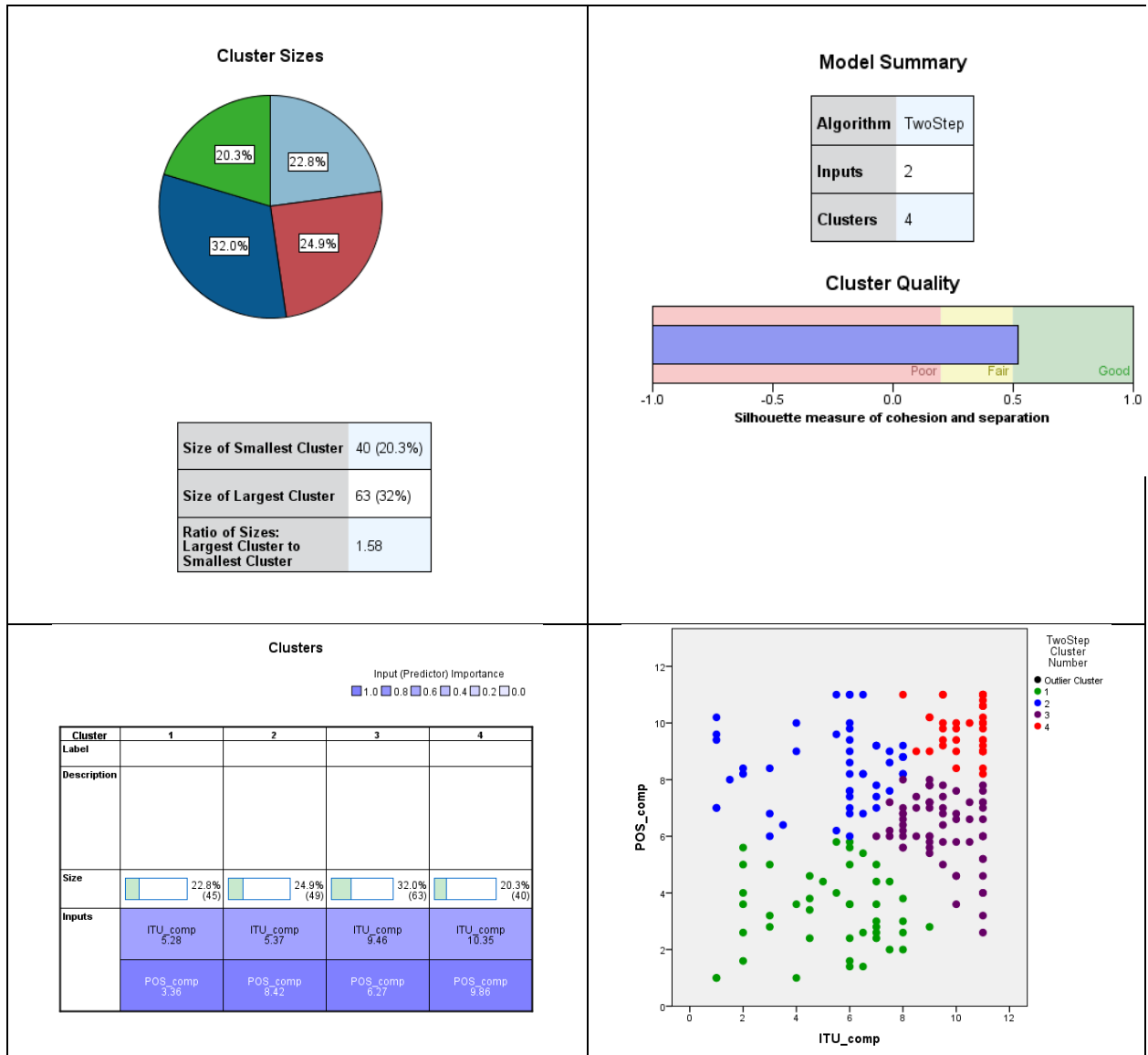
الأشخاص الذين يؤثرون في (مثل العائلة والأصدقاء) يستخدمون الإنترنت بسهولة.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
الأشخاص الذين يؤثرون في (مثل العائلة والأصدقاء) يستخدمون الخدمات الحكومية الإلكترونية بسهولة.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
الأشخاص الذين يؤثرون في (مثل العائلة والأصدقاء) يحدثون عن التجارب السلبية التي حدثت لهم عند استخدامهم الإنترنت.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
الأشخاص الذين يؤثرون في (مثل العائلة والأصدقاء) يحدثون عن التجارب السلبية التي حدثت لهم عند استخدامهم الخدمات الحكومية الإلكترونية.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
الأشخاص الذين يؤثرون في (مثل العائلة والأصدقاء) يحدثون عن التجارب الإيجابية التي حدثت لهم عند استخدامهم الإنترنت.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
الأشخاص الذين يؤثرون في (مثل العائلة والأصدقاء) يحدثون عن التجارب الإيجابية التي حدثت لهم عند استخدامهم الخدمات الحكومية الإلكترونية.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
الأشخاص الذين يؤثرون في (مثل العائلة والأصدقاء) يشجعونني على استخدام الحكومة الإلكترونية.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
من السهل بالنسبة لي لشراء أجهزة كمبيوتر رخيصة حيث أعيش.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أعتقد أن موظفي الحكومة (الدولة) مدركين لعملهم.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أثق في نظم الحكومة الإلكترونية في أبوظبي.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أثق في نظم الحكومة الإلكترونية في الدول التي عشت فيها سابقاً.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

أتق في موظفي الحكومة (الدولة) في الدول التي عشت فيها سابقاً.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أتق في موظفي الحكومة (الدولة) في أبو ظبي.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أعتقد بان المعلومات المقدمة من الخدمات الحكومية عبر الإنترنت يمكن الوثوق بها.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
في حالة حدوث مشكلة ما عند استخدامي للخدمات الحكومية الإلكترونية، انا على ثقة ان شخص ما سيتحمل مسؤولية هذه المشكلة.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أعتقد أن موظفو خدمات الحكومة الإلكترونية جيّدون في عملهم.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أعتقد أن موظفو خدمات الحكومة الإلكترونية مستعدون لتقديم المساعدة.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أعتقد أن موظفو خدمات الحكومة الإلكترونية صادقون.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
أفضل التعامل مع الحكومة الإلكترونية في أبو ظبي عن طريق الانترنت بدلا عن التعامل معها وجها لوجه.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
سوف أستخدم الحكومة الإلكترونية في أبو ظبي فقط إذا كنت مضطراً لذلك.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
سوف أتعامل مع موظفي الحكومة في أبو ظبي وجها لوجه فقط إذا كنت مضطراً لذلك.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
لقد استخدمت الأنظمة الحكومية الإلكترونية في الماضي.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

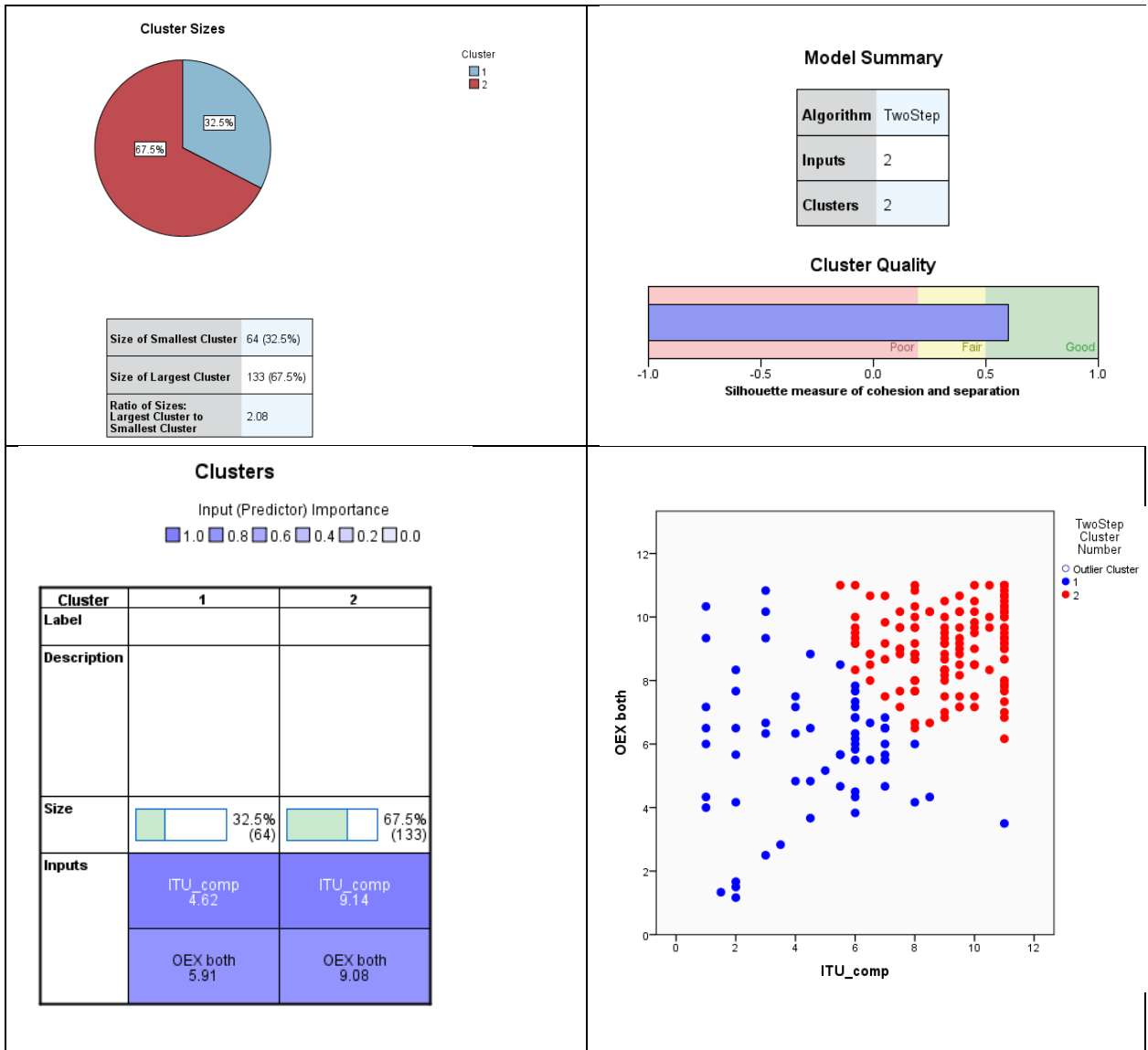
سوف استخدم أنظمة الحكومة الإلكترونية خلال الثلاثة شهور القادمة.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
سوف أستخدم أنظمة الحكومة الإلكترونية خلال الاثني عشر شهراً القادمة.										
أوافق تماماً (10)	9	8	7	6	5	4	3	2	1	لا أوافق تماماً (0)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
هذه هي نهاية الاستبانة!										
أشركم على اكمال هذه الاستبانة. إذا كان لديك أي سؤال فلا تتردد في الاتصال بي في أي وقت عن طريق البريد الإلكتروني في ekabbar@hotmail.com أو kabbar@gmail.com .										

A - 12. Cluster Analysis Results for none DV constructs

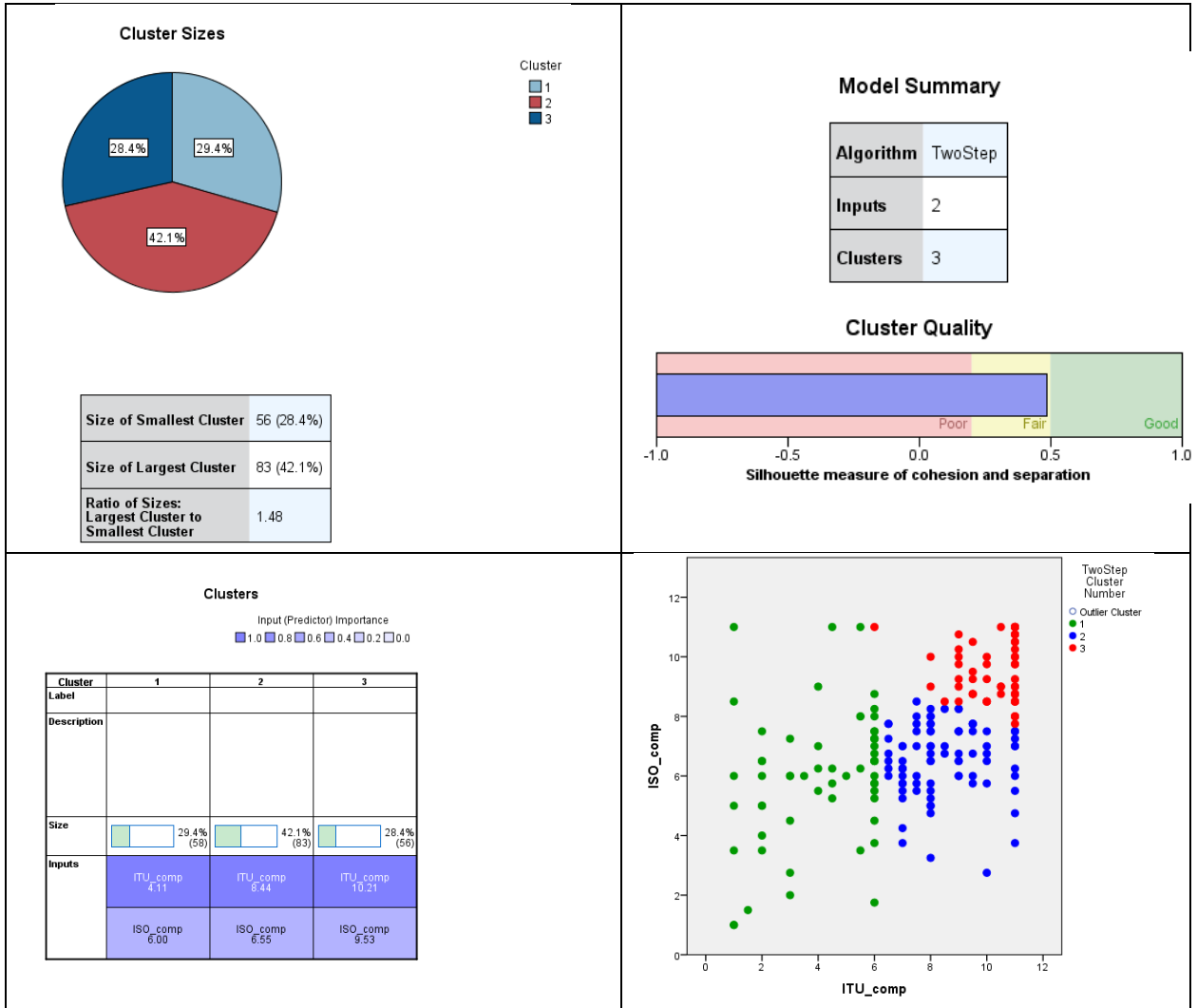
ITU vs. POS



ITU vs. OEX



ITU vs ISO



A - 13. Variables Screening for Skewness and Kurtosis issues

Item	N		Mean	Std. Error of Mean	Std. Deviation	Kurtosis	Std. Error of Kurtosis	Minimum	Maximum	Kurtosis Tests Results using Three different approaches		
	Valid	Missing								Result 1 using z-score > ±3	Result 2 using K > ±2.2 criteria	Result 3 using K > ±1 criteria
OEX1	197	0	8.49	.149	2.091	2.675	.345	1	11	OK	?	?
OEX2	197	0	4.58	.244	3.429	-1.008	.345	1	11	OK	OK	OK
OEX3	197	0	7.71	.196	2.747	-.358	.345	1	11	OK	OK	OK
OEX4	197	0	7.52	.201	2.822	-.484	.345	1	11	OK	OK	OK
OEX5	197	0	6.85	.224	3.146	-1.081	.345	1	11	OK	OK	OK
OEX6	197	0	8.77	.190	2.673	1.070	.345	1	11	OK	OK	OK
OEX7	197	0	8.58	.185	2.595	.980	.345	1	11	OK	OK	OK
OEX8	197	0	8.87	.216	3.036	.912	.345	1	11	OK	OK	OK
OEX9	197	0	7.90	.225	3.160	-.428	.345	1	11	OK	OK	OK
OEX10	197	0	8.03	.191	2.674	-.304	.345	1	11	OK	OK	OK
MOT1	197	0	8.34	.182	2.555	.131	.345	1	11	OK	OK	OK
MOT2	197	0	8.64	.169	2.377	.786	.345	1	11	OK	OK	OK
MOT3	197	0	8.98	.156	2.187	1.716	.345	1	11	OK	OK	?
MOT4	197	0	8.86	.162	2.275	1.619	.345	1	11	OK	OK	?
MOT5	197	0	8.58	.162	2.268	.773	.345	1	11	OK	OK	OK
POS1	197	0	7.20	.206	2.885	-.665	.345	1	11	OK	OK	OK
POS2	197	0	6.74	.213	2.983	-.868	.345	1	11	OK	OK	OK
POS3	197	0	7.08	.190	2.669	-.634	.345	1	11	OK	OK	OK
POS4	197	0	6.60	.208	2.915	-.778	.345	1	11	OK	OK	OK
POS5	197	0	6.74	.203	2.854	-.760	.345	1	11	OK	OK	OK
POS6	197	0	7.28	.188	2.634	-.627	.345	1	11	OK	OK	OK
POS7	197	0	7.48	.196	2.747	-.430	.345	1	11	OK	OK	OK
SC1	197	0	8.26	.153	2.148	.987	.345	1	11	OK	OK	OK
SC2	197	0	7.28	.174	2.447	.107	.345	1	11	OK	OK	OK
SC3	197	0	6.88	.196	2.745	-.331	.345	1	11	OK	OK	OK
SC4	197	0	6.04	.205	2.882	-.717	.345	1	11	OK	OK	OK
SC5	197	0	7.67	.173	2.426	.558	.345	1	11	OK	OK	OK
SC6	197	0	7.13	.184	2.584	-.084	.345	1	11	OK	OK	OK
SC7	197	0	6.85	.186	2.606	-.198	.345	1	11	OK	OK	OK
TRU1	197	0	7.51	.161	2.262	.005	.345	1	11	OK	OK	OK
TRU2	197	0	8.36	.165	2.320	.597	.345	1	11	OK	OK	OK
TRU3	197	0	7.37	.207	2.912	.018	.345	1	11	OK	OK	OK
TRU4	197	0	6.57	.195	2.733	-.288	.345	1	11	OK	OK	OK
TRU5	197	0	8.36	.171	2.407	.473	.345	1	11	OK	OK	OK
TRU6	197	0	8.66	.145	2.035	-.221	.345	3	11	OK	OK	OK
TRU7	197	0	7.11	.194	2.717	-.534	.345	1	11	OK	OK	OK
TRU8	197	0	7.90	.156	2.196	.369	.345	1	11	OK	OK	OK
TRU9	197	0	8.03	.160	2.242	.366	.345	1	11	OK	OK	OK
TRU10	197	0	8.15	.155	2.178	.822	.345	1	11	OK	OK	OK
ITU4	197	0	7.64	.196	2.751	.013	.345	1	11	OK	OK	OK
ITU5	197	0	6.81	.240	3.372	-1.089	.345	1	11	OK	OK	OK
ITU6	197	0	7.36	.226	3.170	-.727	.345	1	11	OK	OK	OK
ITU3	197	0	6.83	.245	3.436	-1.060	.345	1	11	OK	OK	OK
ITU1	197	0	7.48	.214	3.003	-.464	.345	1	11	OK	OK	OK
ITU2	197	0	7.86	.205	2.875	-.186	.345	1	11	OK	OK	OK

Note: ? = value outside the recommended range.

A - 14. Sample Frequency Distribution Tables

Sample Distribution by Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	93	47.2	47.2	47.2
Female	104	52.8	52.8	100.0
Total	197	100.0	100.0	

Sample Distribution by Gender and Citizenship

Citizenship		Frequency	Percent	Valid Percent	Cumulative Percent
Citizens	Male	12	16	16	6.1
	Female	63	84	84	32.0
	Total	75	100	100	38.1
Non - Citizens	Male	81	66.4	66.4	41.1
	Female	41	33.6	33.6	20.8
	Total	122	100	100	61.9
Total		197			100.0

Sample Distribution by Age Group

	Frequency	Percent	Valid Percent	Cumulative Percent
Age Group: 15-24	29	14.7	14.7	14.7
25-34	70	35.5	35.5	50.3
35-44	54	27.4	27.4	77.7
45-54	30	15.2	15.2	92.9
55-64	12	6.1	6.1	99.0
More than 65	2	1.0	1.0	100.0
Total	197	100.0	100.0	

Sample Distribution by Citizenship

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	UAE National	75	38.1	38.1	38.1
	Expatriate	122	61.9	61.9	100.0
	Total	197	100.0	100.0	

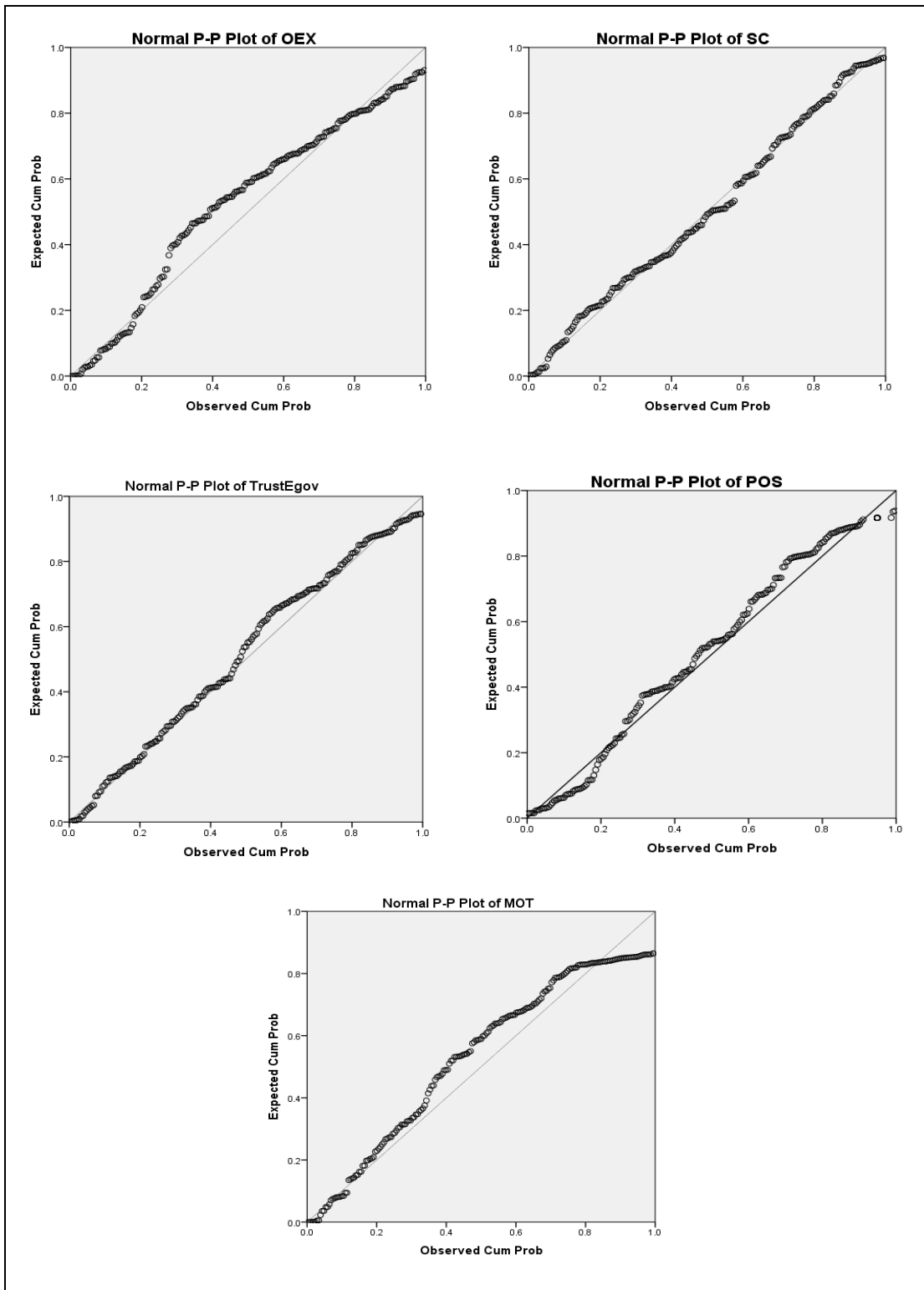
Sample Distribution by Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than High School	4	2.0	2.0	2.0
	High School Graduate	35	17.8	17.8	19.8
	University Degree	84	42.6	42.6	62.4
	Post Graduate Degree	74	37.6	37.6	100.0
	Total	197	100.0	100.0	

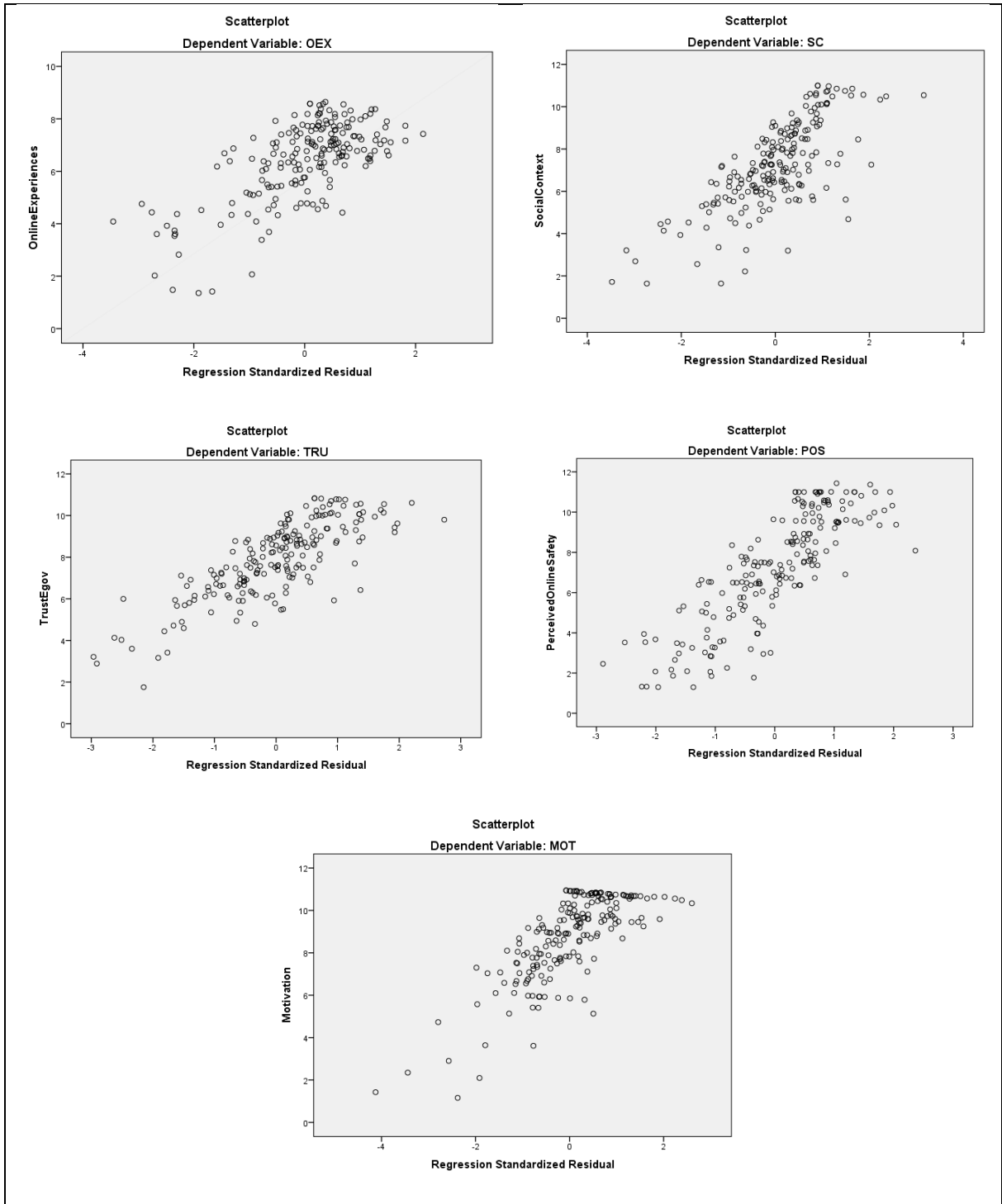
Sample Distribution by Occupation

	Frequency	Percent
Professional/technical	89	45.2
Clerical	15	7.6
Sales	5	2.5
Labourer	28	14.2
Retired	2	1.0
Homemaker	7	3.6
Student	22	11.2
Unemployed	7	3.6
Others	22	11.2
Total	197	100.0

A - 15. Normality Assessment (P-P Plot of dependent variables)



A - 16. Scatterplot of the Dependent Variables



A - 17. Communalities of the study measurement items

Communalities^a

	Initial	Extraction
OEX3	.510	.592
OEX4	.550	.611
OEX5	.472	.491
OEX6	.728	.836
OEX7	.698	.754
OEX8	.631	.630
MOT2	.691	.684
MOT3	.781	.978
MOT5	.577	.547
POS1	.739	.690
POS2	.910	.939
POS2	.870	.877
POS4	.878	.897
POS5	.732	.719
SC2	.581	.565
SC5	.528	.501
SC6	.733	.843
SC7	.661	.683
TRU2	.586	.541
TRU5	.504	.437
TRU7	.531	.492
TRU8	.765	.828
TRU9	.780	.839
TRU10	.624	.620
ITU1	.807	.794
ITU2	.778	.975

Extraction Method: Maximum Likelihood.

A - 18. EFA - Total Variance Explained

Factor	Total Variance Explained								
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.436	36.293	36.293	8.109	31.189	31.189	4.122	15.852	15.852
2	2.971	11.429	47.722	1.759	6.767	37.956	3.835	14.749	30.601
3	2.448	9.416	57.138	2.286	8.790	46.747	2.625	10.097	40.698
4	1.771	6.811	63.949	2.328	8.955	55.701	2.291	8.813	49.512
5	1.637	6.298	70.246	1.863	7.166	62.868	1.987	7.641	57.152
6	1.081	4.159	74.405	1.342	5.160	68.028	1.940	7.460	64.612
7	.925	3.556	77.961	.676	2.598	70.626	1.564	6.014	70.626
8	.698	2.683	80.644						
9	.566	2.177	82.821						
10	.545	2.097	84.918						
11	.454	1.746	86.664						
12	.435	1.674	88.338						
13	.381	1.464	89.802						
14	.371	1.428	91.229						
15	.344	1.324	92.554						
16	.309	1.188	93.741						
17	.264	1.015	94.757						
18	.251	.966	95.723						
19	.235	.905	96.628						
20	.184	.708	97.336						
21	.155	.597	97.933						
22	.145	.558	98.491						
23	.125	.482	98.973						
24	.117	.451	99.424						
25	.084	.324	99.748						
26	.066	.252	100.000						

Extraction Method: Maximum Likelihood.

Reduced Correlation Matrix non-redundant residuals (4.0%)

A - 19. Common Methods Bias (CMB) tests.

Standardized Regression Weights: (ALL - Default model)

with CLF

			Estimate
AWR	<---	OEX	0.792
ACC	<---	OEX	0.88
OS2	<---	POS	0.752
OS4	<---	POS	0.709
OS3	<---	POS	0.738
MOT3	<---	MOT	0.935
MOT2	<---	MOT	0.824
MOT5	<---	MOT	0.74
SC6	<---	SC	0.546
SC5	<---	SC	0.444
SC7	<---	SC	0.63
UB2	<---	ITU	0.845
UB1	<---	ITU	0.964
TEG2	<---	TRU	0.67
TEG5	<---	TRU	0.613
TEG7	<---	TRU	0.559
TEG9	<---	TRU	0.619
TEG10	<---	TRU	0.688
OSEA8	<---	ACC	0.758
OSEA7	<---	ACC	0.854
OSEA6	<---	ACC	0.882
OSEA5	<---	AWR	0.663
OSEA3	<---	AWR	0.76
OSEA4	<---	AWR	0.781
SC2	<---	SC	0.62
OS1	<---	POS	0.611
OS5	<---	POS	0.547
TEG8	<---	TRU	0.616

Standardized Regression Weights: (ALL - Default model)

Without CLF

			Estimate
AWR	<---	OEX	0.79
ACC	<---	OEX	0.873
OS2	<---	POS	0.954
OS4	<---	POS	0.95
OS3	<---	POS	0.941
MOT3	<---	MOT	0.949
MOT2	<---	MOT	0.847
MOT5	<---	MOT	0.756
SC6	<---	SC	0.833
SC5	<---	SC	0.669
SC7	<---	SC	0.872
UB2	<---	ITU	0.86
UB1	<---	ITU	0.987
TEG2	<---	TRU	0.808
TEG5	<---	TRU	0.693
TEG7	<---	TRU	0.739
TEG9	<---	TRU	0.808
TEG10	<---	TRU	0.838
OSEA8	<---	ACC	0.76
OSEA7	<---	ACC	0.867
OSEA6	<---	ACC	0.859
OSEA5	<---	AWR	0.67
OSEA3	<---	AWR	0.746
OSEA4	<---	AWR	0.789
SC2	<---	SC	0.736
OS1	<---	POS	0.789
OS5	<---	POS	0.829
TEG8	<---	TRU	0.782

Delta
-0.002
0.007
0.202
0.241
0.203
0.014
0.023
0.016
0.287
0.225
0.242
0.015
0.023
0.138
0.08
0.18
0.189
0.15
0.002
0.013
-0.023
0.007
-0.014
0.008
0.116
0.178
0.282
0.166

A - 20. Regression Weights after adding CLF

Regression Weights: (ALL - Default model after adding CLF)							
P Values with CLF							
			Estimate	S.E.	C.R.	P	Label
AWR	<---	OEX	1				
ACC	<---	OEX	1.227	0.206	5.945	***	
OS2	<---	POS	1				
OS4	<---	POS	0.92	0.04	22.947	***	
OS3	<---	POS	0.877	0.037	23.868	***	
MOT3	<---	MOT	1				
MOT2	<---	MOT	0.957	0.058	16.367	***	
MOT5	<---	MOT	0.82	0.061	13.406	***	
SC6	<---	SC	1				
SC5	<---	SC	0.765	0.095	8.047	***	
SC7	<---	SC	1.164	0.113	10.265	***	
UB2	<---	ITU	1				
UB1	<---	ITU	1.191	0.086	13.807	***	
TEG2	<---	TRU	1				
TEG5	<---	TRU	0.959	0.105	9.112	***	
TEG7	<---	TRU	0.986	0.114	8.614	***	
TEG9	<---	TRU	0.897	0.088	10.218	***	
TEG10	<---	TRU	0.973	0.105	9.23	***	
OSEA8	<---	ACC	1				
OSEA7	<---	ACC	0.963	0.078	12.271	***	
OSEA6	<---	ACC	1.028	0.091	11.356	***	
OSEA5	<---	AWR	1				
OSEA3	<---	AWR	1.004	0.126	7.98	***	
OSEA4	<---	AWR	1.059	0.125	8.492	***	
SC2	<---	SC	1.077	0.13	8.27	***	
OS1	<---	POS	0.785	0.051	15.259	***	
OS5	<---	POS	0.696	0.061	11.399	***	
TEG8	<---	TRU	0.876	0.088	9.971	***	

Regression Weights: (ALL - Default model)							
P Values without CLF							
			Estimate	S.E.	C.R.	P	Label
AWR	<---	OEX	1				
ACC	<---	OEX	1.209	0.196	6.173	***	
OS2	<---	POS	1				
OS4	<---	POS	0.974	0.033	29.364	***	
OS3	<---	POS	0.883	0.031	28.045	***	
MOT3	<---	MOT	1				
MOT2	<---	MOT	0.969	0.061	15.989	***	
MOT5	<---	MOT	0.826	0.062	13.308	***	
SC6	<---	SC	1				
SC5	<---	SC	0.754	0.074	10.15	***	
SC7	<---	SC	1.056	0.081	13.098	***	
UB2	<---	ITU	1				
UB1	<---	ITU	1.199	0.082	14.554	***	
TEG2	<---	TRU	1				
TEG5	<---	TRU	0.889	0.089	10.043	***	
TEG7	<---	TRU	1.072	0.103	10.456	***	
TEG9	<---	TRU	0.966	0.079	12.231	***	
TEG10	<---	TRU	0.974	0.092	10.571	***	
OSEA8	<---	ACC	1				
OSEA7	<---	ACC	0.976	0.08	12.138	***	
OSEA6	<---	ACC	0.996	0.083	12.056	***	
OSEA5	<---	AWR	1				
OSEA3	<---	AWR	0.973	0.116	8.349	***	
OSEA4	<---	AWR	1.056	0.123	8.583	***	
SC2	<---	SC	0.837	0.075	11.093	***	
OS1	<---	POS	0.8	0.043	18.634	***	
OS5	<---	POS	0.832	0.045	18.376	***	
TEG8	<---	TRU	0.916	0.078	11.756	***	

A - 21. Multicollinearity test results for the main constructs.

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	SocialContext	.639	1.566
	Motivation	.694	1.441
	PerceivedOnlineSafety	.694	1.442
	TrustEgov	.662	1.512

a. Dependent Variable: **Online Experiences**

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	Motivation	.598	1.672
	PerceivedOnlineSafety	.715	1.398
	TrustEgov	.657	1.521
	OnlineExperiences	.548	1.825

a. Dependent Variable: SocialContext

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	PerceivedOnlineSafety	.697	1.435
	TrustEgov	.652	1.533
	OnlineExperiences	.544	1.837
	SocialContext	.547	1.829

a. Dependent Variable: Motivation

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	TrustEgov	.687	1.455
	OnlineExperiences	.467	2.142
	SocialContext	.561	1.781
	Motivation	.598	1.671

a. Dependent Variable: PerceivedOnlineSafety

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	OnlineExperiences	.478	2.090
	SocialContext	.554	1.804
	Motivation	.602	1.662
	PerceivedOnlineSafety	.738	1.354

a. Dependent Variable: TrustEgov

A - 22. Invariance Test Results

Female vs. Male

			Female		Male		z-score
			Estimate	P	Estimate	P	
Accessibility	<---	EaseofAccess	0.724	0.000	1.935	0.000	2.321**
OS1	<---	POS	0.829	0.000	0.779	0.000	-0.580
OS4	<---	POS	0.987	0.000	0.952	0.000	-0.537
OS3	<---	POS	0.897	0.000	0.859	0.000	-0.594
OS5	<---	POS	0.797	0.000	0.874	0.000	0.870
MOT2	<---	MOT	1.048	0.000	0.890	0.000	-1.330
MOT5	<---	MOT	0.921	0.000	0.740	0.000	-1.439
SC2	<---	SC	0.642	0.000	1.065	0.000	2.495**
SC5	<---	SC	0.726	0.000	0.797	0.000	0.440
SC7	<---	SC	0.851	0.000	1.258	0.000	2.261**
TEG5	<---	TRU	1.009	0.000	0.771	0.000	-1.362
TEG7	<---	TRU	1.249	0.000	0.793	0.000	-2.212**
TEG8	<---	TRU	1.019	0.000	0.804	0.000	-1.392
TEG9	<---	TRU	1.078	0.000	0.837	0.000	-1.536
TEG10	<---	TRU	1.124	0.000	0.804	0.000	-1.761*
OSEA7	<---	ACC	1.254	0.000	0.838	0.000	-1.904*
OSEA6	<---	ACC	1.430	0.000	0.831	0.000	-2.453**
OSEA3	<---	AWA	0.799	0.000	1.386	0.000	1.691*
OSEA4	<---	AWA	0.915	0.000	1.437	0.000	1.469
UB1	<---	UseBehavior	1.169	0.000	1.233	0.000	0.373

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10

Expats vs. UAE Nationals

			Nationals		Expats		
			Estimate	P	Estimate	P	z-score
Accessibility	<---	Ease of Access	0.530	0.002	1.659	0.000	2.86***
OS1	<---	POS	0.775	0.000	0.831	0.000	0.621
OS5	<---	POS	0.746	0.000	0.858	0.000	1.137
OS4	<---	POS	0.972	0.000	0.969	0.000	-0.038
OS3	<---	POS	0.920	0.000	0.866	0.000	-0.755
MOT2	<---	MOT	1.067	0.000	0.901	0.000	-1.376
MOT5	<---	MOT	0.847	0.000	0.792	0.000	-0.428
SC2	<---	SC	0.577	0.000	0.949	0.000	2.56**
SC5	<---	SC	0.890	0.000	0.720	0.000	-1.161
SC7	<---	SC	0.885	0.000	1.079	0.000	1.234
TEG5	<---	TRU	0.903	0.000	0.847	0.000	-0.232
TEG7	<---	TRU	1.649	0.000	0.877	0.000	-2.365**
TEG9	<---	TRU	0.914	0.000	0.921	0.000	0.037
TEG10	<---	TRU	1.573	0.000	0.812	0.000	-2.575**
TEG8	<---	TRU	0.961	0.000	0.874	0.000	-0.435
OSEA7	<---	ACC	1.349	0.000	0.893	0.000	-1.269
OSEA6	<---	ACC	1.556	0.000	0.931	0.000	-1.518
OSEA3	<---	AWA	0.729	0.000	1.207	0.000	2.028**
OSEA4	<---	AWA	0.761	0.000	1.234	0.000	1.982**
UB1	<---	UseBehavior	1.110	0.000	1.208	0.000	0.572

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10